determination includes information on the target area, information on the receiver 30, and information on the transmitter 40. The information on the target area is information for identifying the size, the shape, and the like of the target area. The information on the receiver 30 includes information indicating the location of the receiver 30 with respect to the target area. The information on the transmitter 40 includes information for identifying the transmitter 40 (identification information).

[0023] The processor 24 is configured to perform general control of the server 20, that is, to control the first communication unit 21, the second communication unit 22, and the storage 23. The processor 24 may be implemented as a computer system including one or more processors (microprocessors) and one or more memory elements. That is, the one or more processors execute one or more programs (applications) stored in the one or more memory elements to provide functions as the processor 24. In this embodiment, the one or more programs are stored in advance in the one or more memory elements of the processor 24. However, this is only an example and should not be construed as limiting. The one or more programs may also be downloaded via a telecommunications network such as the Internet or may be distributed after having been stored in a non-transitory storage medium such as a memory card.

[0024] As illustrated in FIG. 2, the processor 24 includes the decision unit F11, the calculation unit F12, the determination unit F13, and an adjustment unit F14. In FIG. 2, the decision unit F11, the calculation unit F12, the determination unit F13, and the adjustment unit F14 do not necessarily represent physical components but represent functions implemented by the processor 24.

[0025] The decision unit F11 is configured to decide, based on the strength of the radio signal W10 transmitted from the transmitter 40 and received by the receiver 30, the location of the transmitter 40. In particular, in the present embodiment, the decision unit F11 decides the location of the transmitter 40 in accordance with the location of the receiver 30 and the strength of the radio signal W10. The strength of the radio signal W10 decreases as the distance between the receiver 30 and the transmitter 40 increases. Thus, the distance of the transmitter 40 from the receiver 30 is obtainable from the strength of the radio signal W10 transmitted from the transmitter 40. From the location, which is stored in the storage 23, of the receiver 30 with respect to the target area, the decision unit F11 decides a range (e.g., a circumference centering the receiver 30) within which the transmitter 40 can be present. The decision unit F11 obtains, from different receivers 30, ranges within which the transmitter 40 can be present, and the decision unit F11 adopts, as the location of the transmitter 40, a location at which all the ranges overlap each other.

[0041] In step S12, if the presence determination value is less than the threshold (S12: No), the area determination system 10 calculates the absence determination value (S15). Then, the area determination system 10 checks whether or not the absence determination value is greater than or equal to the absence threshold (S16). If the absence determination value is greater than or equal to the absence threshold (S16: Yes), the area determination system 10 checks whether or not the absence condition is satisfied (S17). If the absence condition is satisfied (S17: Yes), the area determination system 10 determines that the transmitter 40 is outside the target area (S18).

[0042] Note that if in step S13, the presence condition is not satisfied (S13: No), whether or not the transmitter 40 is in the target area cannot be determined (is indeterminable) by the area determination system 10 at this moment (S19). If in step S16, the absence determination value is less than the absence threshold (S16: No), or if in step S17, the absence condition is not satisfied (S17: No), whether or not the transmitter 40 is in the target area cannot be determined (is indeterminable) by the area determination system 10 at this moment (S19).

[0043] 1.4 Summary

As illustrated in FIG. 2, the area determination system 10 described above includes the decision unit F11, the calculation unit F12, and the determination unit F13. As illustrated in FIG. 1, the decision unit F11 is configured to decide, based on the strength of a radio signal W10 transmitted from a transmitter 40 and received by a receiver 30, a location of the transmitter 40. As illustrated in FIG. 3, the calculation unit F12 is configured to calculate a presence determination value. The presence determination values is based on a number of times that the location of the transmitter 40 is determined to be in a presence determination region R10 during a presence determination time periods. The presence determination region (R10) corresponds to a target area. The determination unit F13 is configured to, when a presence condition is satisfied, determine that the transmitter 40 is in the target area. The presence condition is that a state where the presence determination value is greater than or equal to a presence threshold continues for a presence determination time. Such an area determination system 10 can improve the accuracy of determination as to whether or not the transmitter 40 is present in the target area.

[0044] In other words, the area determination system 10 executes the following method (area determination method). The area determination method includes a decision step (S10), a calculation step (S11), and a determination step (S13, S14). The decision step (S10) is a step of deciding, based on the strength of the radio signal W10 transmitted from the transmitter 40 and received by the receiver 30, the location of the transmitter 40. The calculation step (S11) is a step of calculating a presence determination value. The presence determination value is based