Patent claims

1. A method for monitoring an object (20) in the environment of an aircraft (10) on the ground (2), having the steps of:
transmitting (S1) a communication signal between a communication device (21) arranged on the object (20), in particular a land vehicle, and at least one communication device (11) spatially allocated to the aircraft (10) on the ground (2), wherein the at least one communication device (11) spatially allocated to the aircraft (10) on the ground (2) is fitted to an object separate from the aircraft (10), and
determining (S2) spatial location information relating to the object (20) on the basis of the transmitted communication signal.

2. The method as claimed in claim 1,
wherein the determining step (S2) comprises determining relative spatial location information relating to the object (20), in particular a relative position (24) of the object (20), based on the aircraft (10) on the ground (2) on the basis of the transmitted communication signal.

3. The method as claimed in claim 1 or 2,
wherein the determining step (S2) is carried out on the basis of current spatial location information relating to the aircraft (10) on the ground (2) and/or on the basis of a predetermined geometry model of the aircraft (10) on the ground (2).

4. The method as claimed in one of the preceding claims,
wherein at least one of the communication devices (11, 21) has a position determination unit (16, 26) for determining at least one item of position-based information relating to the object (20) and position-based information relating to the aircraft (10) on the ground (2).

5. The method as claimed in one of the preceding claims,
wherein the determining step (S2) comprises determining at least one distance between the at least one communication device (11) allocated to the aircraft (10) on the ground (2) and the communication device (21) arranged on the object (20) on the basis of the transmitted communication signal.

6. The method as claimed in one of the preceding claims,
wherein the communication device (21) arranged on the object (20) and the at least one communication device (11) spatially allocated to the aircraft (10) on the ground (2) each have a communication unit, in particular an ultra-wideband communication unit (12, 22), for communicating a position determination signal, in particular an ultra-wideband radio signal (5).

7. The method as claimed in one of the preceding claims, having the further step of:
ascertaining (S3) a movement behavior of the object (20) based on the aircraft (10) on the ground (2) on the basis of the determined spatial location information relating to the object (20).

8. The method as claimed in claim 7,
wherein the determining step (S2) and the ascertaining step (S3) are repeatedly carried out, and having the further step of:
monitoring the repeatedly ascertained movement behavior of the object (20) based on the aircraft (10) on the ground (2) on the basis of the repeatedly determined spatial location information relating to the object (20).

9. The method as claimed in one of the preceding claims, having the further step of:
allocating (S0a), in particular semantically allocating, at least one communication device (11) to the aircraft (10).

10. The method as claimed in one of the preceding claims,
wherein the communication device (21) arranged on the object (20) and the communication device (11) spatially allocated to the aircraft (10) on the ground (2) each have an activation unit, in particular a sub-GHz activation unit (13, 23),
having the further step of: communicating (S0b) an activation signal, in particular a sub-GHz radio signal (7), between the activation units,
wherein the transmitting step (S1) is carried out on the basis of the communicated activation signal.

11. The method as claimed in one of the preceding claims,
wherein the aircraft (10) on the ground (2) is in a parked position (14) when carrying out the method.

12. The method as claimed in one of the preceding claims,
wherein the at least one communication device (11) spatially allocated to the aircraft (10) on the ground (2) is fitted to ~~an object separate from the aircraft (10), in particular to~~ a means for securing a parked position (14) of the aircraft (10).

13. The method as claimed in one of the preceding claims,
wherein the at least one communication device (11) spatially allocated to the aircraft (10) on the ground (2) can be operated in an autonomous manner in terms of energy and is, in particular, in the form of a battery-operated communication device (11).

14. The method as claimed in one of the preceding claims, having the further step of:
communicating (S4) an information signal based on the determined spatial location information relating to the object (20) to a monitoring device for the purpose of avoiding or documenting a collision (3) between the object (20) and the aircraft (10) on the ground (2).

15. The method as claimed in one of the preceding claims, having the further step of:
intervening (S5) in the operation of the object (20) on the basis of the determined spatial location information relating to the object (20) in order to avoid a collision (3) between the object (20) and the aircraft (10) on the ground (2).

16. The method as claimed in one of the preceding claims, having the further step of:
triggering a warning signal (8), in particular on the object (20), on the basis of the determined spatial location information relating to the object (20) in order to warn of a potential collision (3) between the object (20) and the aircraft (10) on the ground (2).

17. The method as claimed in one of the preceding claims, having the further step of:
establishing, on the basis of the determined spatial location information relating to the object (20), whether a collision (3) will take place or has taken place between the object (20) and the aircraft (10) on the ground (2), and
in particular determining a collision location (15) on the aircraft (10) if a collision (3) between the object (20) and the aircraft (10) has been determined.

18. A device (30), in particular a mobile terminal (32),

which is configured to communicate with at least one communication device (21) arranged on an object (20), in particular a land vehicle, and at least one communication device (11) allocated to an aircraft (10) on the ground (2) in order to cause a communication signal to be transmitted between the communication devices (11, 21), wherein the at least one communication device (11) spatially allocated to the aircraft (10) on the ground (2) is fitted to an object separate from the aircraft (10), and
wherein the device (30) has an interface (33) which is configured to read in data based on the communication signal transmitted between the communication devices (11, 21), and
wherein the device (30) has a determination unit which is configured to determine spatial location information relating to the object (20) on the basis of the data which have been read in.

19. A system (40) for monitoring an object (20) in the environment of an aircraft (10) on the ground (2), having the following system components:
at least one communication device (11) which can be allocated to the aircraft (10) on the ground (2) and is configured to communicate with a communication device (21) arranged on the object (20), in particular a land vehicle, and
the device (30) as claimed in claim 18.

20. The system (40) as claimed in claim 19,
wherein the at least one communication device (11) which can be allocated to the aircraft (10) on the ground (2) is in the form of a portable system component.