receptacle contains an access device that controls a lock thereon along with the ability to receive identification codes used to permit the unlocking of the receptacle. The receptacle further contains a scanner that reads labels on parcels that are deposited into it and sends the information to a carrier or central processing station in order to track parcels and manage payment transactions.

[0007] The above disclosed devices provide significant utility for their designated purposes. However, they are not currently optimized for use with unmanned aerial vehicles or other drones when about to land to deliver or pick up a parcel.

[0008] More specifically, currently, and in a general sense, drone delivery is envisioned as having a customer order an available product, designates the destination location, select the time frame and pays for the product. The order is put in the queue, item is picked, packed, and secured to the drone. The flight plan is loaded. The drone flies between 400 and 1,000 feet at 100 mph or less using flight corridors (three-dimensional aerial freeways) as required. Nearing the destination, the drone exits the corridor and flies to the GPS location at approximately a 400 foot altitude. The drone with package descends like an elevator and the package is released on or near the ground.

[0009] Concerns arise with respect to accidents occurring during a drone's flight. More specifically, concerns exist should communication with the drone be lost and how to avoid collisions. Furthermore, just as airplane accidents are more frequent during takeoff and landing, the same may be true with drone flights, especially if the drone is controlled remotely by a user.

[0010] Given the foregoing, a need exists for a system or method which facilitates the use of a drone delivery system such that deliveries and pick-ups of parcels can be made securely and accurately without human involvement.

SUMMARY

[0011] This Summary is provided to introduce a selection of concepts. These concepts are further described below in the Detailed Description section. This Summary is not intended to identify key features, or essential features, of the embodiments disclosed herein, nor is this Summary intended as an aid in determining the scope of the embodiments.

[0011a] According to a first aspect, there is provided a system comprising: a landing location for a drone: and a homing device configured to broadcast a beacon signal capable of being received by the drone when the drone is in proximity to the landing location,

independent of whether the drone is in communication with another source; wherein, responsive to a return signal from the drone, the homing device is further configured to provide guidance data to the drone while the drone is in proximity to the landing location, independent of whether the drone remains in communication with the another source.

[0011b] According to a second aspect, there is provided a system comprising a homing device configured to broadcast a beacon signal capable of being received by a drone, independent of whether the homing device and the drone are positioned in a line of sight relative to each other.

[0011c] According to a third aspect, there is provided a method comprising: detecting, by a homing device, a drone when the drone is within proximity of a landing location and the drone is about to transition to a landing phase of a flight plan; determining, by a homing device, whether the drone is authorized to land at the landing location; and if the drone is authorized to land at the landing location, guiding, by the homing device, the drone to the landing location independent of whether the drone remains in communication with another source.

[0011d] According to a fourth aspect, there is provided a system comprising a homing device configured to interact with a drone to provide guidance data to the drone to a landing location through interaction between the drone and the homing device while the drone remains in contact with another source.

[0012] Embodiments relate to a system, a method and computer software to facilitate the accurate and secure delivery and pick-up of parcels by drones at specific locations without human interaction. The system comprises a landing location where a drone at least

CLAIMS

We claim:

1. A system comprising:

a landing location ~~where~~for a drone ~~at least one of delivers, and acquires a parcel; and~~

a homing device configured to ~~interact with~~ broadcast a beacon signal capable of being received by the drone ~~to guide~~when the drone is in proximity to the landing location, independent of ~~interaction from~~ whether the drone is in communication with another source;

wherein, responsive to a return signal from the drone, the homing device ~~guides the drone during~~ is further configured to provide guidance data to the drone while the drone is in proximity to the landing ~~phase~~location, independent of ~~a flight plan~~whether the drone remains in communication with the another source.

2. The system according to claim 1, wherein the homing device is ~~a part of~~formed integral to the landing location.

3. The system according to claim 1, wherein the landing location comprises a container ~~into which a parcel is at least one of removed from within or upon and placed within or upon by the drone~~configured to receive a package.

4. The system according to claim 3, wherein the container comprises a transportation subsystem configured to move the container to ~~a~~an alternative landing location ~~for~~upon receipt of a command from the ~~drone to at least one of deliver and acquire the parcel~~homing device.

5. The system according to claim 4, wherein the homing device assesses at least one environmental condition along a first path the drone will take to reach the landing location and commands the container to move from a current position to another position to create a second path for the drone to reach the alternative landing location when the homing device determines that the first path is not suitable for the drone ~~to take~~.

6. The system according to claim ~~3~~1, wherein the landing location comprises a landing pad ~~onto which a parcel is at least placed upon or removed from by the drone~~.

7. The system according to claim 6, wherein the landing pad comprises a transportation subsystem configured to move the landing pad ~~for the drone~~ to ~~at least one~~an alternative landing location upon receipt of ~~deliver and acquire~~a command from the ~~parcel~~homing device.

8. The system according to claim 1, wherein the homing device further comprises a navigator that comprises at least one ~~navigation~~navigational subsystem to ~~direct~~ provide navigation commands to the drone ~~at least one of to and from the landing location~~.

~~9. The system according to claim~~ 83, wherein the homing device further ~~comprises a communicator to communicate with at least the drone to determine whether a parcel to be delivered is to be delivered at the landing location.~~

~~10.~~9. ~~The system according to claim 9, wherein the communicator further~~ communicates with a communication device of at least one of a recipient of the ~~parcel~~package and a sender of the ~~parcel to at least one of notify when~~package to provide delivery ~~occurs and confirm that delivery is intended at the landing location.~~ status.

~~11.~~10. The system according to claim 3, wherein the container comprises a locking mechanism to ~~allow~~restrict access into the container ~~by at least one of a drone~~to an authenticated ~~to at least one of deliver and retrieve a parcel from the container~~ drone and a user of the container.

~~12.~~11. A system comprising a homing device configured to ~~interact with~~broadcast a ~~delivery~~ beacon ~~to guide the delivery beacon to a location to at least one of deliver and pick up a parcel, through interaction between the delivery beacon and the~~ signal capable of being received by a drone, independent of whether the homing device and ~~independent of interaction with another source~~the drone are positioned in a line of sight relative to each other.

~~13.~~12. The system according to claim ~~12~~11, further comprising a landing location ~~where the parcel is delivered or retrieved from.~~ and wherein the homing device is in proximity to the landing location.

13. The system according to claim 12, wherein the landing location comprises one of a container configured to receive a package and a landing pad.

~~14.~~ The system according to claim 13, wherein the ~~landing location comprises a~~ one of the container ~~into which a parcel is at least one of removed from within or upon and placed within or upon.~~

~~15.~~14. ~~The system according to claim 14, wherein the secure parcel box~~and the landing pad comprises a transportation subsystem to move the one of the container ~~to~~ and the landing pad from a current location ~~for the drone to at least one of deliver and acquire the parcel~~to another location.

~~16.~~15. The system according to claim ~~15~~14, wherein ~~when~~ the ~~delivery beacon is on a drone, the~~ homing device assesses at least one environmental condition along a first path of the drone ~~will take to reach the landing location~~ and commands the one of the container and the landing pad to move from ~~a~~the current ~~position~~location to the another ~~position~~location to create a second path for the drone to reach the ~~landing location when the first path is not suitable for the drone to take~~one of the container and the landing pad.

~~17.~~16. A method comprising:

detecting, by a homing device, a drone when the drone is within ~~a distance~~proximity of a landing location ~~with a homing device when~~and the drone is about to transition to a landing phase of ~~its~~a flight plan;

determining, by a homing device, whether the drone is authorized to land at the landing location ~~with the homing device~~; and

if the drone is authorized to land at the landing location, guiding, by the homing device, the drone to the landing location ~~with the homing device~~ independent of ~~interaction~~whether the drone remains in communication with another source.

~~18.~~17. The method according to claim ~~17~~16, further comprising determining, by a homing device, whether a designated path to be taken by the drone to ~~land at~~ the landing location is acceptable ~~for the drone to land with the homing device~~.

~~19.~~18. The method according to claim ~~18~~17, further comprising locating, by the homing device, an auxiliary landing location and directing, by the homing device, the drone to the auxiliary landing location when the designated path is determined to be unacceptable ~~with the homing device~~.

~~20.~~19. The method according to claim ~~18~~17, further comprising commanding, by the homing device, the landing location to move to an auxiliary location and ~~to direct~~directing, by the homing device, the drone to the auxiliary location when the designated path is determined to be unacceptable ~~with the homing device~~.

~~21.~~20. The method according to claim ~~17~~16, further comprising communicating, by the homing device, with ~~of~~ at least one of a recipient of ~~the parcel~~a package and a sender of the ~~parcel to at least one of notify when~~package to provide delivery ~~occurs and confirm that delivery is intended~~status of the package at the landing location ~~with the homing device~~.

~~20.~~21. A system comprising a homing device configured to interact with a drone to ~~guide~~provide guidance data to the drone to a landing location through interaction between the drone and the homing device ~~that is independent of interaction~~while the drone remains in contact with another source.

~~21.~~22. The system according to claim ~~20~~21, further comprising a landing location where the drone lands and takes off.

~~22.~~23. The system according to claim ~~20~~21, wherein the landing location comprises one of a container ~~into which a parcel is at least one of removed from within or upon and placed within or upon by the drone~~configured to receive a package and a landing pad.

~~23.~~24. The system according to claim ~~20~~23, wherein the ~~secure parcel box~~one of the container and the landing pad comprises a transportation subsystem to move the one of the container and the landing pad to ~~an~~ an alternative location ~~for the drone to at least one of deliver and acquire the parcel~~.

~~24.~~

25. The system according to claim ~~20~~21, wherein the homing device assesses at least one environmental condition along a first flight path of the drone ~~will take to reach the landing location~~ and commands the ~~container~~ landing location to move from a current position to another position to create a second flight path for the drone to reach ~~the~~an alternative landing location ~~when the first path is not suitable for the drone to take.~~