flight assignment printouts. This can lead to the ground operators making mistakes in the flight assignments which can cause service mishandlings and flight delays.

A further problem with this conventional system is that ground operators are required to listen and communicate via a walkie-talkie while simultaneously carrying out ground services tasks. This can be dangerous, particularly when a ground operator is driving a heavy vehicle because there is a risk that the ground operator will lose concentration and crash the vehicle. This risk not only puts the life of the ground operator in danger, but also the lives of the other ground operators and potentially also the passengers and staff on an aircraft.

The present invention seeks to provide an improved ramp services control system and method.

According to one aspect of the present invention, there is provided a ramp services control system for use in an airport, the system comprising: a central control station which is configured for wireless communication; and a plurality of wearable mobile devices which are each configured to be worn by a respective operator and configured to communicate wirelessly with the central control station, each wearable mobile device comprising: a communication unit which is configured to receive a ramp services instruction wirelessly from the central control station; a screen which is configured to output the ramp services instruction visually to an operator; and an input device which is configured to receive an input from the operator in response to the received ramp services instruction, the communication unit being configured to transmit data indicative of the input from the operator to the central control station, such that the central control station can monitor ramp services instructions sent to the wearable mobile devices and responses transmitted from the wearable mobile devices in response to the ramp services instructions to control ramp service operations in an airport.

Conveniently, each wearable mobile device is a smartwatch.

Advantageously, the screen of each wearable mobile device is a touchscreen.

Preferably, each of the wearable mobile devices comprises a ground navigational system using satellites which is configured to determine the position of the wearable mobile device, and wherein the communication unit is configured to transmit data indicative of the determined position of the wearable mobile device to the central control station.

Conveniently, each wearable mobile device comprises an accelerometer which is configured to measure the acceleration or deceleration of the wearable mobile device, and wherein the communication unit is configured to transmit data indicative of the measured acceleration or deceleration of the wearable mobile device to the central control station.

Advantageously, each wearable mobile device comprises a digital compass which is configured to measure the direction of travel of the wearable mobile device, and wherein the communication unit is configured to transmit data indicative of the direction of travel of the wearable mobile device to the central control station.

Preferably, the system further comprises: a plurality of audio output devices, each audio output device being configured to be carried by an operator and configured to provide an audio output corresponding to the ramp services instruction to the operator.

Conveniently, each audio output device is a bone conduction headset.

Advantageously, each bone conduction headset is integrated into protective headgear to be worn by an operator.

Preferably, the ramp services instruction is at least one of a flight assignment for an operator and a flight update for an operator.

Preferably, the ramp services instruction comprises at least one of an instruction for an operator to carry out a ramp services task, another instruction or a warning.

Conveniently, the central control station is configured to select a subset of the plurality of wearable mobile devices and transmit a ramp services instruction to only the selected subset of wearable mobile devices.

Advantageously, the central control station is configured to select the subset of wearable mobile devices in response to one or more of the position, availability, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services of the staff wearing the wearable mobile devices in an airport.

Preferably, the central control station comprises: a display unit which is configured to display a map of an airport and the relative positions of each of the wearable mobile devices in the airport.

Conveniently, the display unit of the central control station is configured to display the subset of wearable mobile devices differently from the other wearable mobile devices on the map of the airport.

Advantageously, the display unit is configured to display one or more of each staff’s position, availability, ability to operate certain equipment or carry out

certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services.

Preferably, the display unit is configured to display one or more of an indication of the ramp services required for a particular flight and/or the position, status and details of relevant ramp equipment required in order to carry out the ramp services.

According to another aspect of the present invention, there is provided a method for controlling ramp services in an airport, the method comprising: transmitting a ramp services instruction wirelessly from a central control station to at least one wearable mobile device, the at least one wearable mobile device being worn by a respective operator; receiving the ramp services instruction via a communication module in the at least one of the wearable mobile device; outputting the ramp services instruction visually via a screen in the at least one wearable mobile device to an operator carrying the at least one wearable mobile device; receiving an input from the operator via an input device in the at least one wearable mobile device in response to the received ramp services instruction; and transmitting data indicative of the input from the operator to the central control station, such that the central control station can monitor ramp services instructions sent to the wearable mobile devices and responses transmitted from the wearable mobile devices in response to the ramp services instructions to control ramp service operations in an airport.Conveniently, each mobile device is a smartwatch.

Advantageously, the screen of each wearable mobile device is a touchscreen.

Preferably, each of the wearable mobile devices comprises a ground navigational system using satellites which is configured to determine the position of the

wearable mobile device, and wherein the method comprises transmitting data indicative of the determined position of the wearable mobile device to the central control station.

Conveniently, each wearable mobile device comprises an accelerometer which is configured to measure the acceleration or deceleration of the wearable mobile device, and wherein the method comprises transmitting data indicative of the measured acceleration or deceleration of the wearable mobile device to the central control station.

Advantageously, each wearable mobile device comprises a digital compass which is configured to measure the direction of travel of the wearable mobile device, and wherein the method comprises transmitting data indicative of the direction of travel of the wearable mobile device to the central control station.

Preferably, the method further comprises: providing an audio output corresponding to the ramp services instruction to an operator via an audio device carried by the operator.

Conveniently, the audio output device is a bone conduction headset.

Advantageously, the bone conduction headset is integrated into protective headgear to be worn by the operator.

Preferably, the ramp services instruction is at least one of a flight assignment for an operator and a flight update for an operator.

Preferably, the ramp services instruction comprises at least one of an instruction for an operator to carry out a ramp services task, another instruction or a warning.

Conveniently, the method further comprises selecting a subset of a plurality of wearable mobile devices and transmitting a ramp services instruction to only the selected subset of wearable mobile devices.

Advantageously, the method further comprises selecting the subset of wearable mobile devices in response to one or more of the position, availability, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services of the staff wearing the wearable mobile devices in an airport.

Preferably, the method further comprises: displaying on a display unit at the central control station a map of an airport and the relative positions of each of the wearable mobile devices in the airport.

Conveniently, the method comprises displaying the subset of wearable mobile devices differently from the other wearable mobile devices on the map of the airport.

Advantageously, the method comprises displaying on the display unit one or more of each staff's position, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services.

Preferably, the method comprises displaying on the display unit one or more of an indication of the ramp services required for a particular flight and/or the position, status and details of relevant ramp equipment required in order to carry out the ramp services.

So that the present invention may be more readily understood, embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

CLAIMS:

1. A ramp services control system for use in an airport, the system comprising:

a central control station which is configured for wireless communication; and

a plurality of wearable mobile devices which are each configured to be worn by a respective operator and configured to communicate wirelessly with the central control station, each wearable mobile device comprising:

a communication unit which is configured to receive a ramp services instruction wirelessly from the central control station;

a screen which is configured to output the ramp services instruction visually to an operator; and

an input device which is configured to receive an input from the operator in response to the received ramp services instruction, the communication unit being configured to transmit data indicative of the input from the operator to the central control station, such that the central control station can monitor ramp services instructions sent to the wearable mobile devices and responses transmitted from the wearable mobile devices in response to the ramp services instructions to control ramp service operations in an airport.

2. The ramp services control system of claim 1, wherein each wearable mobile device is a smartwatch.

3. The ramp services control system of claim 1 or claim 2, wherein the screen of each wearable mobile device is a touchscreen.

4. The ramp services control system of any one of the preceding claims, wherein each of the wearable mobile devices comprises a ground navigational system using satellites which is configured to determine the position of the wearable mobile device, and wherein the communication unit is configured to transmit data indicative of the determined position of the wearable mobile device to the central control station.

5. The ramp services control system of any one of the preceding claims, wherein each wearable mobile device comprises an accelerometer which is configured to measure the acceleration or deceleration of the wearable mobile device, and wherein the communication unit is configured to transmit data indicative of the measured acceleration or deceleration of the wearable mobile device to the central control station.

6. The ramp services control system of any one of the preceding claims, wherein each wearable mobile device comprises a digital compass which is configured to measure the direction of travel of the wearable mobile device, and wherein the communication unit is configured to transmit data indicative of the direction of travel of the wearable mobile device to the central control station.

7. The ramp services control system of any one of the preceding claims, wherein the system further comprises:

a plurality of audio output devices, each audio output device being configured to be carried by an operator and configured to provide an audio output corresponding to the ramp services instruction to the operator.

8. The ramp services control system of claim 6, wherein each audio output device is a bone conduction headset.

9. The ramp services control system of claim 7, wherein each bone conduction headset is integrated into protective headgear to be worn by an operator.

10. The ramp services control system of any one of the preceding claims, wherein the ramp services instruction is at least one of a flight assignment for an operator and a flight update for an operator.

11. The ramp services control system of any one of the preceding claims, wherein the ramp services instruction comprises at least one of an instruction for an operator to carry out a ramp services task, another instruction or a warning.

12. The ramp services control system of any one of the preceding claims, wherein the central control station is configured to select a subset of the plurality of wearable mobile devices and transmit a ramp services instruction to only the selected subset of wearable mobile devices.

13. The ramp services control system of claim 12, wherein the central control station is configured to select the subset of wearable mobile devices in response to one or more of the position, availability, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services of the staff wearing the wearable mobile devices in an airport.

14. The ramp services control system of any one of the preceding claims, wherein the central control station comprises:

a display unit which is configured to display a map of an airport and the relative positions of each of the wearable mobile devices in the airport.

15. The ramp services control system of claim 14 as dependent on claim 13, wherein the display unit of the central control station is configured to display the subset of wearable mobile devices differently from the other wearable mobile devices on the map of the airport.

16. The ramp services control system of claim 14 or claim 15, wherein the display unit is configured to display one or more of each staff's position, availability, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services.

17. The ramp services control system of any one of claims 14 to 16, wherein the display unit is configured to display one or more of an indication of the ramp services required for a particular flight and/or the position, status and details of relevant ramp equipment required in order to carry out the ramp services.

18. A method for controlling ramp services in an airport, the method comprising:

transmitting a ramp services instruction wirelessly from a central control station to at least one wearable mobile device, the at least one wearable mobile device being worn by a respective operator;

receiving the ramp services instruction via a communication module in the at least one of the wearable mobile device;

outputting the ramp services instruction visually via a screen in the at least one wearable mobile device to an operator carrying the at least one wearable mobile device;

receiving an input from the operator via an input device in the at least one wearable mobile device in response to the received ramp services instruction; and

transmitting data indicative of the input from the operator to the central control station, such that the central control station can monitor ramp services instructions sent to the wearable mobile devices and responses transmitted from the wearable mobile devices in response to the ramp services instructions to control ramp service operations in an airport.

19. The method of claim 18, wherein each wearable mobile device is a smartwatch.

20. The method of claim 18 or claim 19, wherein the screen of each wearable mobile device is a touchscreen.

21. The method of any one of claims 18 to 20, wherein each of the wearable mobile devices comprises a ground navigational system using satellites which is configured to determine the position of the wearable mobile device, and wherein the method comprises transmitting data indicative of the determined position of the wearable mobile device to the central control station.

22. The method of any one of claims 18 to 21, wherein each wearable mobile device comprises an accelerometer which is configured to measure the acceleration or deceleration of the wearable mobile device, and wherein the method comprises transmitting data indicative of the measured acceleration or deceleration of the wearable mobile device to the central control station.

23. The method of any one of claims 18 to 22, wherein each wearable mobile device comprises a digital compass which is configured to measure the direction of travel of the wearable mobile device, and wherein the method comprises transmitting data indicative of the direction of travel of the wearable mobile device to the central control station.

24. The method of any one of claims 18 to 23, wherein the method further comprises:

providing an audio output corresponding to the ramp services instruction to an operator via an audio device carried by the operator.

25. The method of claim 24, wherein the audio output device is a bone conduction headset.

26. The method of claim 25, wherein the bone conduction headset is integrated into protective headgear to be worn by the operator.

27. The method of any one of claims 18 to 26, wherein the ramp services instruction is at least one of a flight assignment for an operator and a flight update for an operator.

28. The method of any one of claims 18 to 27, wherein the ramp services instruction comprises at least one of an instruction for an operator to carry out a ramp services task, another instruction or a warning.

29. The method of any one of claims 18 to 28, wherein the method further comprises selecting a subset of a plurality of wearable mobile devices and transmitting a ramp services instruction to only the selected subset of wearable mobile devices.

30. The method of claim 29, wherein the method further comprises selecting the subset of wearable mobile devices in response to one or more of the position, availability, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services of the staff wearing the wearable mobile devices in an airport.

31. The method of any one of claims 18 to 30, wherein the method further comprises:

displaying on a display unit at the central control station a map of an airport and the relative positions of each of the wearable mobile devices in the airport.

32. The method of claim 31 as dependent on claim 30, wherein the method comprises displaying the subset of wearable mobile devices differently from the other wearable mobile devices on the map of the airport.

33. The method of claim 31 or claim 32, wherein the method comprises displaying on the display unit one or more of each staff's position, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services.

34. The method of any one of claims 31 to 33, wherein the method comprises displaying on the display unit one or more of an indication of the ramp services required for a particular flight and/or the position, status and details of relevant ramp equipment required in order to carry out the ramp services.