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(54) **Flight planning methods and systems**

(57) A method and apparatus for operating an electronic flight plan processing system, the method comprising receiving as data input at the system flight plans from

a plurality of users, and determining, for each one of the flight plans whether there is a conflict with any of the other flight plans.

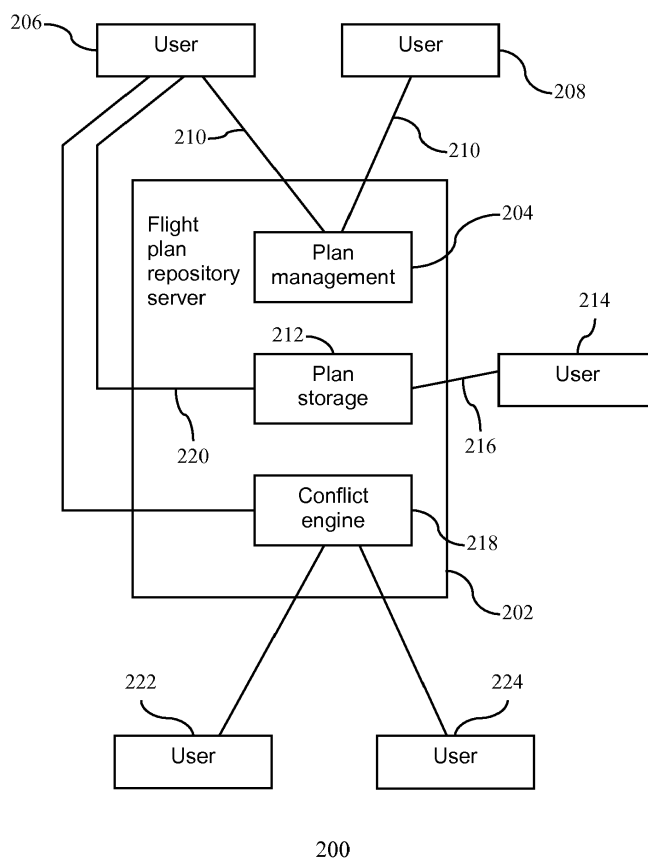


Figure 2

Description**FIELD OF EMBODIMENTS OF THE INVENTION**

[0001] Embodiments of the invention relate to flight planning methods and systems.

BACKGROUND TO EMBODIMENTS OF THE INVENTION

[0002] Fixed wing aircraft are judged to be low flying when they are less than 2000 feet from the ground. Light propeller driven aircraft and helicopters are judged to be low flying below 500 feet from the ground during the day and below 2000 feet at night. To manage low flying traffic density and increase flight safety, an authority divides the UK into defined Low Flying Areas (LFAs). The operating heights and areas used prevent reliable radar or radio coverage or provision of Air Traffic services. Users can book area entry/exit times and locations via a centralised booking cell, or in some cases a controlling authority. Booking requirements are designed to manage traffic density and provide an audit trail, for example in the case of low flying complaints or incidents. During the day, users are invariably unaware of any other booked users' detailed routes or timings. At night, users should be aware of others' intended general routing and outside timings, such as, for example, approximate times for entry into and exit from a certain area.

[0003] There are a number of bases from which low flying activity may be coordinated. Flight activity planned by a base may be publicised by the base to one or more other bases. Typically a base may provide details of flight plans to other bases chosen by that base. A base may even choose not to share details of flight plans with other bases. An attempt is also made in the base to analyse any potential areas and/or times of conflicts with plans from the same base or flight activity information received from other bases. A conflict may be, for example, where plans and other information indicate that two aircraft may come to within a short distance from each other.

[0004] Plans made available by various bases vary in their format, level of detail and provision method. For example, some bases may provide more detail on their planned activity than other bases. Some bases may provide information on their planned activity in an electronic format, and others may provide information in another format, such as sketches, faxes, or using the telephone. As a result, it is difficult for a base to identify conflicts between plans of that base and plans of other bases.

[0005] If a conflict with a plan from another base is identified, a base typically changes its plan, but does not provide information on the changes. Therefore, other bases may be unaware of the new plan. Furthermore, late changes to a flight plan may result in new conflicts, and it may take considerable time to review flight plan changes and identify the new conflicts.

[0006] The lack of information exchanged between

bases, and the potential for errors when determining conflicts, may increase the risk of air-to-air collisions or proximity incidents.

SUMMARY OF EMBODIMENTS OF THE INVENTION

[0007] According to a first aspect of embodiments of the invention, there is provided a method, such as for example a computer-implemented method, of operating an electronic flight plan processing system, the method comprising receiving as data input at the system flight plans from a plurality of users; and determining, for each one of the flight plans whether there is a conflict with any of the other flight plans.

[0008] Thus, a method is provided that can provide users (such as, for example, pilots, flight planners, mission planners, bases and/or other users) with means for submitting a flight plan which is then compared with other flight plans (such as, for example, those previously submitted by the same or other users) in order to determine whether the submitted flight plan conflicts with any of the other flight plans. As a result, a method is provided that can be used to ensure that there are no conflicts between any flight plans or any users, or ensure that any conflicts are acceptable or intended, or ensure that knowledge of any conflicts is gained before flights according to the plans go ahead.

[0009] Embodiments of the invention may allow users to become more aware of other aircraft and their expected positions, any potential conflicts with other aircraft, and the like. This may be used, for example, to create a flight plan or revise an existing flight plan to avoid or resolve conflicts or to ensure that any conflicts are acceptable or indicated to a user such as a pilot or crew. As a result, the likelihood of actual conflicts between flying aircraft may be reduced. This may be the case even in the absence of other detection systems such as ground-based radar.

[0010] In some embodiments, the method comprises sending one or more conflicts determined for a flight plan to a user associated with the flight plan. Therefore, a user that submits a flight plan can view the conflicts between that flight plan and other flight plans. The conflicts may be displayable, for example, as a list of the conflicts or a map including graphical representations of the conflicts and of one or more of the flight plans. This allows the conflicts to be easily and quickly understood by the user. The graphical representations could be displayable including a graphical representation of aircraft on its flight plan at a time that is predetermined or selected by a user. Thus, the user can view conflicts at selected times during the flight plan associated with that user, for example. The user could, for example, use a slider control to control the selected time between the start and end times of the user's associated flight plan or between other times, and conflicts at the selected time could be displayed to the user. A graphical representation of an aircraft at the expected time may help to visualise the expected positions

of any aircraft at or near the time of a conflict. The graphical representation of a flight plan may be interactive such that interaction with the graphical representation initiates communication between a user and another user associated with that flight plan. Thus, for example, a user may contact another user quickly and easily if flight plans associated with the users have conflicts.

[0011] In some embodiments, the method comprises sending a notification to one or more users associated with flight plans for which conflicts with other flight plans are determined. Thus, for example, the user has knowledge that the user's associated flight plan conflicts with other flight plans. This may be the case even after the user has submitted a flight plan and no conflicts are determined. For example, the notification may comprise a SMS message, email or other message. In embodiments of the invention where the method is implemented using a software application, the user may be informed of conflicts even when the user is no longer using the software application, for example.

[0012] In some embodiments, the method comprises sending expected positions of one or more aircraft at a current, predetermined or selected time to a user based on one or more of the flight plans. As a result, a user may be able to create a flight plan that takes into account of existing flight plans from other users, or obtain awareness of current expected positions of aircraft.

[0013] In some embodiments, conflicts between two flight plans are determined where the flight plans indicate that respective aircraft will be simultaneously within a predetermined region and/or will move to within a threshold distance and/or altitude of each other.

[0014] According to a second aspect of embodiments of the invention, there is provided a method, such as for example a computer-implemented method, of flight planning, comprising generating data representing a flight plan, sending the flight plan to an electronic flight plan repository server, and receiving information on conflicts between the flight plan and one or more other flight plans from the flight plan repository server. Thus, a user can submit a flight plan and be informed if the flight plan conflicts with other flight plans from the same and/or different users.

[0015] In some embodiments, the information may comprise a list of conflicts, a SMS message, an email message, other message, and/or a graphical representation of the flight plan and/or the one or more other flight plans.

[0016] The method may further comprise generating and sending a revised flight plan to the flight plan repository server. Therefore, any updates to a flight plan (for example for resolving conflicts) can be made available.

[0017] The method may also comprise receiving expected positions of one or more aircraft at a current, predetermined or selected time based on the flight plan and the one or more other flight plans. Therefore, expected positions of aircraft and times may be viewed to aid in determining conflicts and their locations and times.

[0018] In some embodiments, the information on conflicts indicates that aircraft associated with the flight plan and one of the other flight plans respectively will be simultaneously within a predetermined region and/or will move to within a threshold distance and/or altitude of each other.

[0019] According to a third aspect of embodiments of the invention, there is provided a method, such as for example a computer-implemented method, of operating an electronic flight plan processing system, the method comprising receiving as data input at the system flight plans transmitted from a plurality of remote users; receiving as data input at the system a flight plan inspection query transmitted from a remote user, the flight plan inspection query including one or more inspection criteria; determining flight plans information from said flight plans data in accordance with said one or more inspection criteria; and transmitting said flight plans information to the remote user. The one or more criteria may include a specified time and/or a specified location and/or a specified aircraft type.

[0020] Other aspects of embodiments of the invention include an apparatus comprising means for carrying out the method of the first and second aspects, a computer program comprising computer readable instructions for carrying out the method of the first and second aspects, and computer readable storage storing the computer program.

BRIEF DESCRIPTION OF THE FIGURES

[0021] Embodiments of the invention will now be described by way of example only with reference to the figures, in which:

Figure 1 shows an example of a map including a plurality of low flying areas (LFAs) and two flight plans;

Figure 2 shows an example of a flight planning system;

Figure 3 shows an example of an embodiment of a flight planning method carried out by a flight plan repository server;

Figure 4 shows an example of an embodiment of a flight planning method carried out by a user; and

Figure 5 shows an example of a data processing system suitable for use with embodiments of the invention.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0022] Embodiments of the present invention provide methods and apparatus for flight planning for aircraft. In

particular, certain embodiments provide a central facility, such as a central flight plan repository, where multiple users can deposit flight plans and/or retrieve details of conflicts between flight plans, regardless of the users that submitted the flight plans. A user may be, for example, a pilot, a member of a crew, a base, a flight coordinator for a base, or some other individual, group or organisation. An aircraft may be a fixed-wing aircraft, helicopter or similar.

[0023] Figure 1 shows a simplified example of a map 100 including five low flying areas (LFAs) 102. A first flight plan (illustrated by dotted line 104) indicates that an aircraft will take off at a first point A in a first LFA 106, fly to points B and C in a second LFA 108, and land at point D. A second flight plan (illustrated by dashed line 110) indicates that another aircraft will take off from point E in LFA 108, and fly to points F, G, H and J before landing again at the starting point E.

[0024] It should be noted that in some embodiments of the invention geographical areas such as LFAs may not be present or may be disregarded. In other embodiments of the invention, certain details such as takeoff and landing points may be disregarded or not important or relevant. For example, embodiments of the invention may be concerned with flight planning for the region 108 shown in Figure 1. For the flight plan 104, the take off point A is outside of the region, and therefore is not considered by the flight planning system. In some embodiments, the take off point A may not be provided to the flight planning system. Instead, the point X where the associated aircraft enters the region 108 may be provided to or used by the flight planning system. Similarly, where the landing point is outside of the region 108 or an aircraft leaves then re-enters the region 108, the associated entry and/or exit points may be provided to the flight planning system.

[0025] The flight plans describing the first and second flights may also include times at which the respective aircraft associated with each flight plan will take off, reach the designated points on the flight path (such as points B, C, F, G, H and J for example) and land, and/or the planned altitude of an aircraft at or between each point. Therefore, embodiments of the invention are able to determine from the flight plans the expected positions of aircraft throughout their planned flights. From this, embodiments of the invention may calculate the expected distance between aircraft during their planned flights, and thus determine if there will be any conflicts between flight plans. For example, a conflict may be determined where two aircraft are expected to fly to within a certain distance from each other, pass near a certain point or region within a certain window of time, or carry out some other incident that may present an unacceptable risk of a collision or proximity incident, or some other risk. In some embodiments, whether a conflict is determined also depends on other factors such as aircraft type and/or weather conditions. For example, the flight planning system may be aware that it is acceptable for certain types of aircraft to

fly closer to each other, and therefore a conflict is only determined for a reduced potential distance between two aircraft compared with other types of aircraft.

[0026] Figure 2 shows an example of a flight planning system 200. The system 200 includes a flight plan repository server 202. The server 202 includes a plan management component 204 that receives flight plans from users. Figure 2 shows the plan management component 204 configured to receive flight plans from two users 206 and 208, although the component 204 may receive one or more flight plans from each of a greater number of users, for example three or more users.

[0027] The plan management component 204 accepts flight plans from users. The flight plans may be provided in any of a number of ways. For example, users may present the flight plans to the component 204 electronically by email or by uploading a file. Preferably, the flight plans conform to a single format, although there may be multiple formats that are acceptable to the plan management component 204. Examples of possible electronic formats include XML and comma-separated values (CSV). Alternatively, for example, the users could be provided with software that allows the users to plan flights and/or interact with the plan management component 204 to provide flight plan details to the flight plan repository server 202. Alternatively, for example, the plan management component 204 is a web-based component that allows users to provide plan details directly to the server 202 using a web-based interface. Communications links 210 between users and the server 202 may include any number of wireless and/or wired networks including the internet, cellular/mobile telephone networks, direct wired links and the like. One or more of the users may be located at a remote location from the server 202.

[0028] Flight plans and details received by the plan management component 204 are stored in a plan storage component 212. Stored flight plans can be viewed by a user 214 over a connection 216 that may or may not be the same as connection 210. To view a stored flight plan, the user 214 may retrieve details of the flight plan (for example, a list of the points and times of a flight plan), a graphical representation of the flight plan (such as a map with the flight plan superimposed, similar to the map 100 of Figure 1) or some other details of the flight plan. A user may view flight plans associated with that user or flight plans associated with another user. A user is associated with a flight plan if, for example, the user is a pilot that will be piloting an aircraft for that flight plan, a member of a crew that will be on board the aircraft, a base from which the aircraft will be flying, a flight coordinator that planned the flight, or some other associated individual, group or organisation.

[0029] The user may also view multiple flight plans, such as two flight plans as shown in Figure 1. The user may specify the flight plans to be viewed, or flight plans that may be of interest to the user may be provided. For example, the user may wish to view a flight plan associated with that user. In addition to that flight plan, other

flight plans may be provided that are within a certain distance and/or time of the user's flight plan, as determined by a conflict engine 218 as described in more detail below.

[0030] Figure 2 also shows the user 206 arranged to view flight plans stored in the plan storage 212 over a connection 220 that may or may not be the same as connection 210 and/or 216. In embodiments of the invention, all users may be arranged to interact with all parts of the flight plan repository server 202, although in alternative embodiments certain users may be restricted to only being able to interact with certain parts of the server 202.

[0031] The conflict engine 218 processes each flight plan by comparing it to all other flight plans in the plan storage 212. The conflict engine therefore determines whether there are any conflicts between any two flight plans. If there are any conflicts between two flight plans, for example, the conflict engine 218 may inform user 222 and/or 224 that there is a conflict between two flight plans, and may also provide details of the conflict. For example, the users 222 and 224 may be users associated with flight plans for which one or more conflicts have been determined.

[0032] For example, the conflict engine may identify conflicts based on one or more criteria. The criteria may specify, for example, that two aircraft may not come to within a certain distance of each other. In certain embodiments, the criteria may be specified on a per-user, per-aircraft or per-base basis. As an example, consider a fast moving jet aircraft that must have 2000m clear airspace around it at all times, that comes to within 1000m of a slower moving helicopter that must have 500m clear airspace around it at all times. In this scenario, the conflict criteria for the jet aircraft are met but not for the helicopter. As a result, the conflict engine may inform a user or base associated with the jet aircraft of the conflict, but may or may not inform the user or base associated with the helicopter. Alternatively, a warning may be sent to the user or base associated with the helicopter that the helicopter causes a conflict with another aircraft even though the helicopter itself has no conflicts. The user or base may then expect information or a request to change the helicopter's flight plan from another user or base.

[0033] The conflict engine 218 may also determine whether there are any conflicts between one flight plan and other hazards, such as for example wires, towers or NOTAMs (Notices To Airmen). A NOTAM may specify, for example, that a certain area must be avoided. A NOTAM may be raised or informed after a flight plan has been provided to the server 202. In this case, the conflict engine 218 may check previous flight plans for conflicts with the new NOTAM and inform users or bases accordingly.

[0034] Referring to the example flight plans 104 and 110 shown in Figure 1, it can be seen that the flight plans cross on the two-dimensional map at points K, L and M. There may potentially be conflicts at these points, particularly if the aircraft associated with the flight plans 104

and 110 pass through or near points K, L and M at the same time, within a time window, and/or at a similar altitude. This is shown as an example and there may be three or more flight plans displayed, and this may depend on the number of flight plans that conflict or nearly conflict with a particular flight plan.

[0035] The conflict engine 218 of Figure 2 may inform the users 222 and 224 of conflicts for example when each user consults the flight plan repository server 202. Additionally or alternatively, for example, the flight plan repository server 202 may inform the users 222 and 224 using some other means that allows a notification of one or more conflicts to be sent to the users without the users consulting the server 202. For example, the server 202 may send or arrange to send a notification such as an email or SMS message (or some other message or notification) that can be received by the users without consulting the server 202. Therefore, a user can be kept informed of up-to-date information on conflicts between flight plans associated with that user and other flight plans of the same or other users. Details of the conflicts could be included in the notification, or such details may be retrieved when the user next consults the flight plan repository server 202.

[0036] When a user consults the flight plan repository server 202 to receive details regarding any conflicts from the conflict engine 218, the details may be received in a number of ways. For example, the user may receive or view a list of conflicts including the times and locations of those conflicts. Additionally or alternatively, for example, the user may view a map that includes graphical representations of the user's associated flight plan and any flight plans with which there are conflicts. The lines 104 and 110 may be considered examples of graphical representations of flight plans. Any conflicts may be highlighted on each of the graphical representations. In addition, in some embodiments, the graphical representation may include a graphical representation of aircraft for each of the flight plans being viewed. A user may view the expected position of each aircraft on the flight plans being viewed at a time that is predetermined or selected by a user. Thus, for example, the user may be able to view the positions of the aircraft at the times of the conflicts, and/or may be able to view the positions of the aircraft throughout the time period of one of the flight plans. The user may be presented with a slider or other selector that selects a time between the take off and landing times of one of the flight plans.

[0037] In some embodiments, graphical representations of flight plans (such as lines 104 and 110 shown in Figure 1) and/or the associated graphical representations of aircraft are interactive. For example, a user may interact with a graphical representation to initiate or enable communication with a user associated with the graphical representation. For example, if a user is viewing a map that includes graphical representations of the user's flight plan and a conflicting flight plan, the user may interact with the graphical representation of the con-

flicting flight plan and send a message to the user associated with the conflicting flight plan. Thus, the user of the conflicting flight plan may receive a message that is not merely a notification or details of flight plan conflicts, but may also include further details provided by another user. Thus, the users could use such further communications to resolve conflicts between them.

[0038] Figure 2 also shows the user 206 interacting with the conflict engine 218. Each user may be able to view or receive details regarding conflicts between that user's flight plans or other users' flight plans, or may be able to view conflicts between two or more flight plans that are not associated with the user.

[0039] Thus, embodiments of the present invention may inform users of conflicts between flight plans. Conflict awareness may contribute to flight safety. For example, a user may make changes to a flight plan if there are changes with other flight plans. A user may merely use knowledge of the conflicts to take other precautions, particularly if, for example, visual contact between two aircraft is sufficient to avoid a mid-air collision. Knowledge of a potential conflict may allow aircraft to obtain visual contact more easily and/or quickly. In some embodiments, conflicts may be desired, for example during in-flight refuelling, and no avoidance action may be taken for such conflicts.

[0040] Figure 3 shows an example of a method 300 of flight planning that may be implemented by the flight plan repository server 202. The method starts at step 302 where flight plans are received from one or more users. Next, at step 304, one or more users may view flight plans or flight plans may be sent to interested users. At step 306, each flight plan is compared with other flight plans to identify conflicts. In step 308, it is determined whether any conflicts have been identified. If conflicts have been identified, the method continues to step 310, where action is taken. This action may be, for example, to display a message and/or conflict details to a user, and/or send a notification to an associated user, for example. The method then ends at step 312. If no conflicts are identified then the method ends after step 308.

[0041] Figure 4 shows an example of a method 400 carried out by a user in a flight planning process. At the start of the method 400 in step 402, a user logs in to the flight plan repository server 202. Each user may be provided with a username and/or password to allow a submitted flight plan to be associated with a particular user, for example, and/or to prevent unauthorised users from accessing the server 202. Next in step 404, the user may optionally view flight plans previously submitted by the user and/or other users. These may assist the user in planning the user's own flights. Then, in step 406, the user prepares a flight plan, although it should be noted that if the user does not view existing flight plans in step 404 there is no need for the user to log in to the server 202 before the flight plan is prepared. The user then submits the flight plan to the server 202 in step 408. If the user has submitted a flight plan for which conflicts with

other flight plans are determined by the server 202, the user receives details of conflicts in step 410. For example, the details may be a notification that conflicts exist and/or may be time and/or location details of conflicts. In step 412, the user decides whether to resolve the conflicts. In some embodiments, as shown in Figure 4, the user may resolve a conflict by amending the user's flight plan in step 406 and re-submitting the plan to the server in step 408. If instead the user does not resolve conflicts (for example, if there are no conflicts, if the conflicts are acceptable or if the conflicts are intended) then the method instead ends at step 414.

[0042] Figure 5 shows an example of a data processing system 500 that may be suitable for implementing embodiments of a flight plan repository server and/or flight planning system, and may be suitable for use by users to interact with the flight plan repository server. The data processing system 500 includes a central processing unit (CPU) 502 and a memory 504. The system 500 may also include a permanent storage device 506 such as a hard disk, and/or a network device 508 for communications over a network such as the internet. Furthermore, the system 500 may include a display device 510 and/or a human interface device such as a mouse and/or keyboard.

[0043] In embodiments of the invention, a data processing system may comprise a single data processing system 500 or may comprise multiple data processing systems that are located locally or at remote locations. For example, multiple locally located data processing systems could be provided for performance and/or high availability in the event of a component failure, and multiple remotely located data processing systems could be provided for high availability in the event of building infrastructure failure, for example.

[0044] In embodiments of the invention, communications between any users and the flight plan repository server may be encrypted if desired.

[0045] All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

[0046] Each feature disclosed in this specification (including any accompanying claims, abstract and drawings) may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

Claims

1. A method of operating an electronic flight plan processing system, the method comprising:

- receiving as data input at the system flight plans from a plurality of users; and
determining, for each one of the flight plans whether there is a conflict with any of the other flight plans.
2. The method of claim 1, comprising sending one or more conflicts determined for a flight plan to a user associated with the flight plan.
3. The method of claim 2, wherein the one or more conflicts are displayable as a list of the conflicts or on a map including graphical representations of the conflicts and of one or more of the flight plans.
4. The method of claim 3, wherein a graphical representation of a flight plan includes a graphical representation of an aircraft on its flight plan at a time that is predetermined or selected by a user.
5. The method of claim 3 or 4, wherein the graphical representation of a flight plan is interactive such that interaction with the graphical representation initiates communication between a user and another user associated with that flight plan.
6. The method of any of the preceding claims, comprising sending a notification to one or more users associated with flight plans for which conflicts with other flight plans are determined.
7. The method of claim 6, wherein the notification comprises a SMS message, email or other message.
8. The method of any of the preceding claims, comprising sending expected positions of one or more aircraft at a current, predetermined or selected time to a user based on one or more of the flight plans.
9. The method of any of the preceding claims, wherein conflicts between two flight plans are determined where the flight plans indicate that respective aircraft will be simultaneously within a predetermined region and/or will move to within a threshold distance and/or altitude of each other.
10. A method of flight planning, comprising:
generating data representing a flight plan;
sending the flight plan to an electronic flight plan repository server; and
receiving information on conflicts between the flight plan and one or more other flight plans from the flight plan repository server.
11. The method of claim 10, wherein the information comprises a list of conflicts, a SMS message, an email message, other message, and/or a graphical
- representation of the flight plan and/or the one or more other flight plans.
12. The method of claim 10 or 11, comprising generating and sending a revised flight plan to the electronic flight plan repository server.
13. The method of any of claims 10 to 12, comprising receiving expected positions of one or more aircraft at a current, predetermined or selected time based on the flight plan and the one or more other flight plans.
14. The method of any of claims 10 to 13, wherein the information on conflicts indicates that aircraft associated with the flight plan and one of the other flight plans respectively will be simultaneously within a predetermined region and/or will move to within a threshold distance and/or altitude of each other.
15. A method of operating an electronic flight plan processing system, the method comprising:
receiving as data input at the system flight plans transmitted from a plurality of remote users;
receiving as data input at the system a flight plan inspection query transmitted from a remote user, the flight plan inspection query including one or more inspection criteria;
determining flight plans information from said flight plans data in accordance with said one or more inspection criteria; and
transmitting said flight plans information to the remote user.
16. A method according to claim 15, wherein the one or more criteria include a specified time and/or a specified location and/or a specified aircraft type.
17. Apparatus comprising means for carrying out the method of any of the preceding claims.
18. A computer program comprising computer readable instructions for carrying out the method of any of claims 1 to 16.
19. Computer readable storage storing the computer program of claim 18.

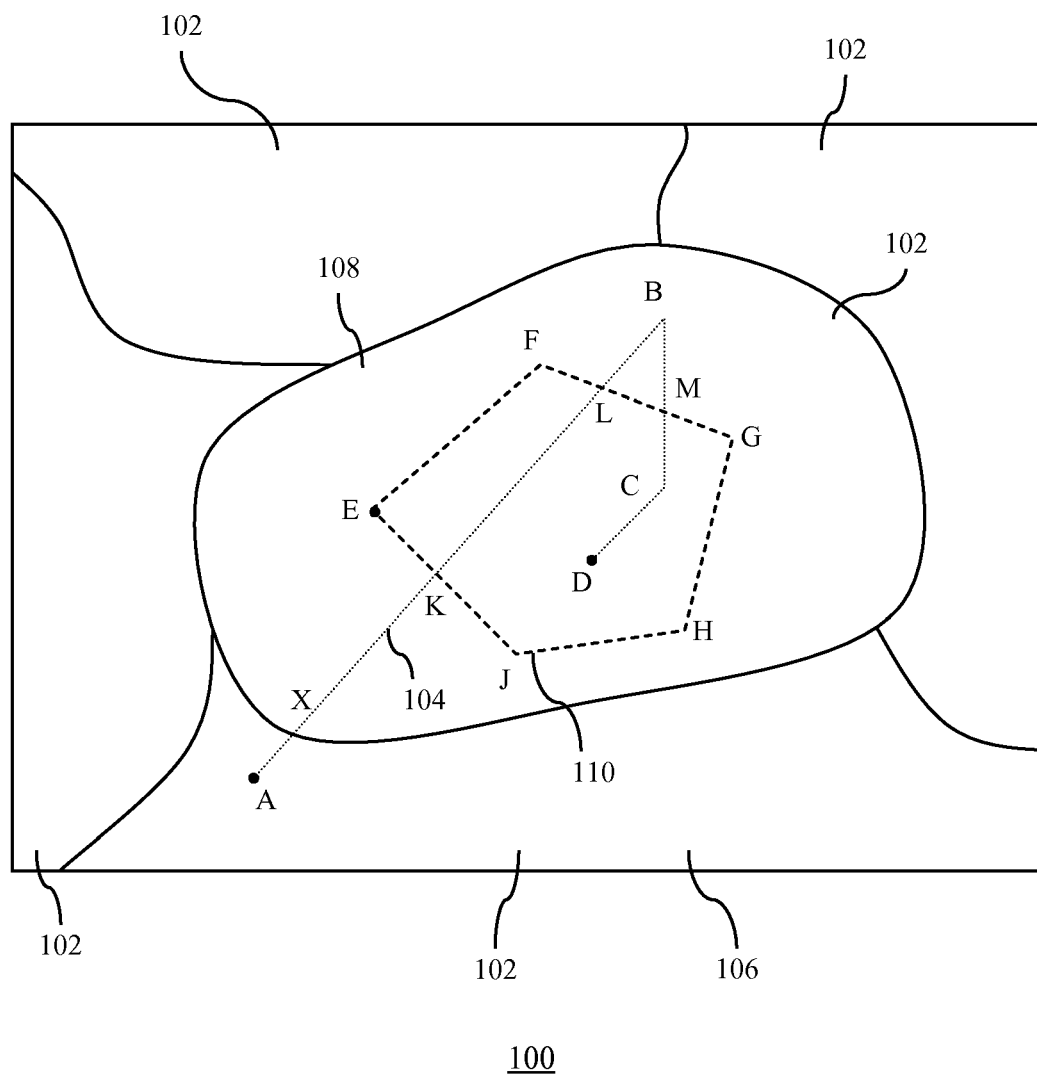
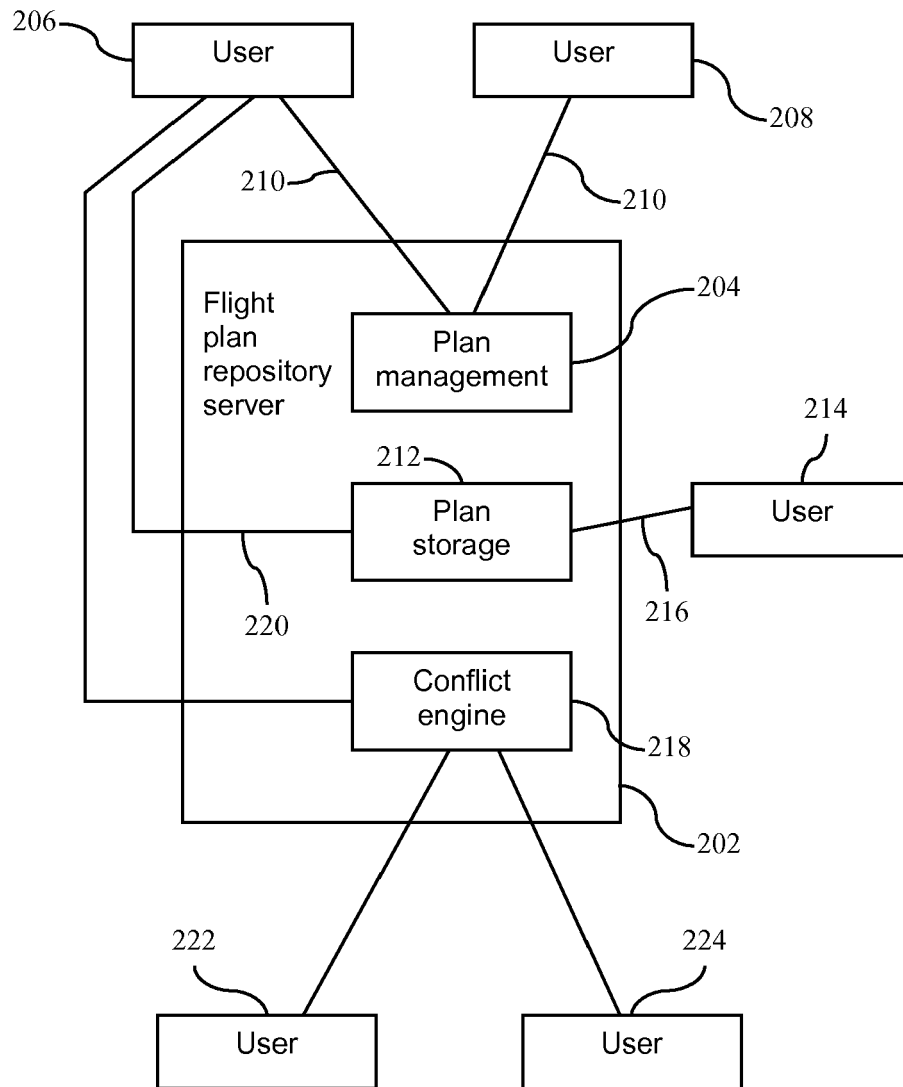
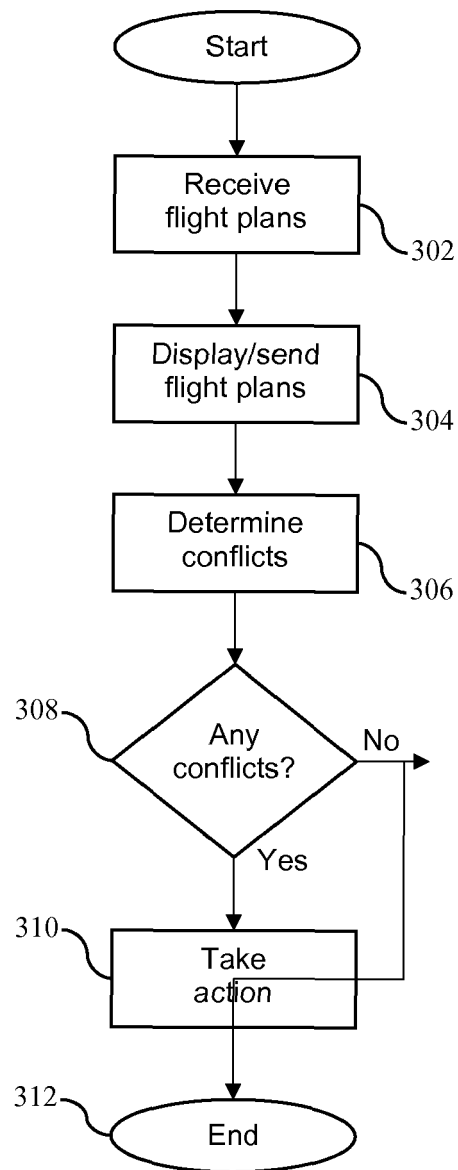


Figure 1



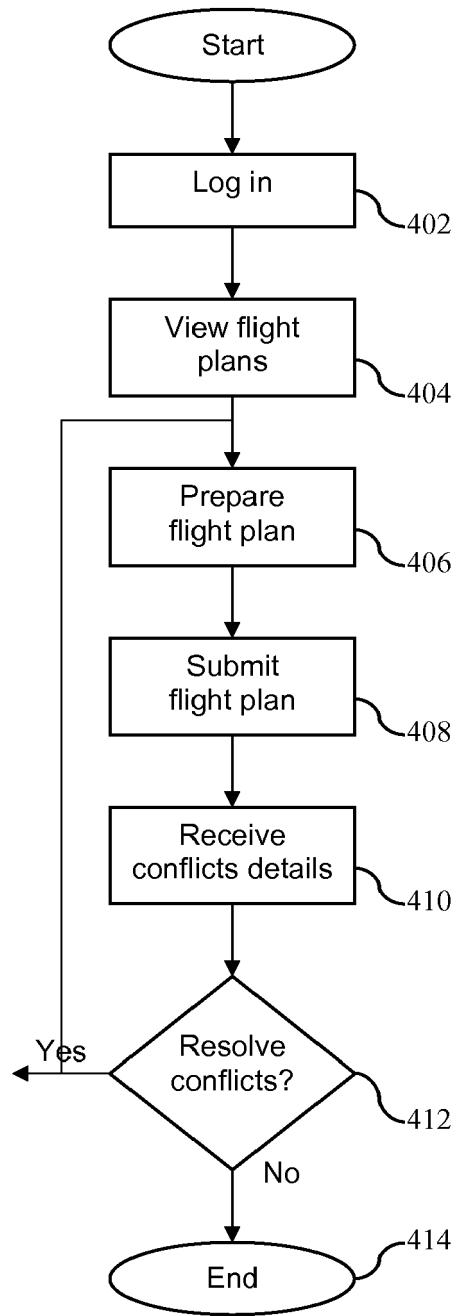
200

Figure 2



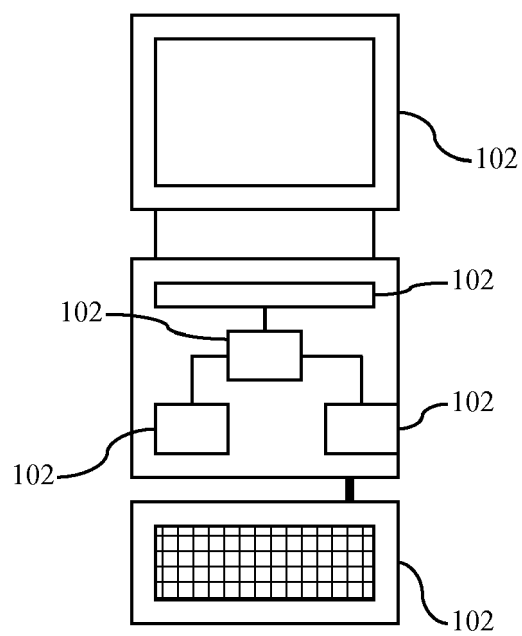
300

Figure 3



400

Figure 4



500

Figure 5

**PARTIAL EUROPEAN SEARCH REPORT**

Application Number

under Rule 62a and/or 63 of the European Patent Convention.
This report shall be considered, for the purposes of
subsequent proceedings, as the European search report

EP 10 27 5046

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2004/102505 A2 (VILLIERS JACQUES [FR]) 25 November 2004 (2004-11-25) * the whole document *	1-14, 17-19	INV. G08G5/00 G01C23/00
X	FR 2 923 008 A1 (THALES SA [FR]) 1 May 2009 (2009-05-01) * the whole document *	1-14, 17-19	
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X	FR 2 894 056 A1 (THALES SA [FR]) 1 June 2007 (2007-06-01) * the whole document *	1-14, 17-19	
X	FR 2 905 505 A1 (THALES SA [FR]) 7 March 2008 (2008-03-07) * the whole document *	1-14, 17-19	TECHNICAL FIELDS SEARCHED (IPC)
	-/--		G08G G01C
INCOMPLETE SEARCH			
The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out. Claims searched completely : Claims searched incompletely : Claims not searched : Reason for the limitation of the search: see sheet C			
Place of search The Hague		Date of completion of the search 4 February 2011	Examiner Pariset, Nadia
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03/82 (P04E07)



PARTIAL EUROPEAN SEARCH REPORT

Application Number
EP 10 27 5046

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	WO 2007/072015 A2 (NATS EN ROUTE PLC [GB]; JAMES BRIAN [GB]) 28 June 2007 (2007-06-28) * the whole document *	1-14, 17-19	
A	US 2010/049380 A1 (HIALE-GUILHAMOU MATHIEU [FR] ET AL) 25 February 2010 (2010-02-25) * sentence 69, paragraph 64; figures 1,3 *	1-19	
			TECHNICAL FIELDS SEARCHED (IPC)

**INCOMPLETE SEARCH
SHEET C**

Application Number

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Claim(s) searched incompletely:
1-14, 17-19

Reason for the limitation of the search:

A meaningful search is not possible on the basis of claims 1-14, 17-19, because the subject-matter of said claims is not considered as an invention according to Article 52 (2)(c) EPC as indicated in the invitation pursuant to Rule 63(1) EPC.

Independent claims 1, 10 attempt to define the subject-matter in terms of the result to be achieved. In particular, claim 1 and (implicitly) claim 10 comprise the step of determining conflicts between flight plans, which simply consists in claiming the underlying alleged technical problem (description, p. 2, l. 21-29). Independents claim 1 and 10 do not contain any technical feature as how each step of the methods are implemented. The search has been therefore limited to the embodiment disclosed in the current description on page 7, l. 20 - page 12, l. 2, figure 2.



Application Number

EP 10 27 5046

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-14(completely); 17-19(partially)

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 10 27 5046

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-14(completely); 17-19(partially)

Method for determining conflicts in an electronic flight
plan processing system

2. claims: 15, 16(completely); 17-19(partially)

Method for selecting flight plans information in an
electronic flight plan processing system from flight plans
data in accordance with inspection criteria

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 27 5046

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

04-02-2011

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