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**Datasheet for the decision
of 19 June 2023**

Case Number: T 0270/20 - 3.5.01

Application Number: 17382762.7

Publication Number: 3483802

IPC: G06Q10/04

Language of the proceedings: EN

Title of invention:

A SYSTEM AND METHOD FOR DETERMINING THE RUNWAY CONFIGURATION
OF AN AIRPORT

Applicant:

The Boeing Company

Headword:

Runway configuration/BOEING

Relevant legal provisions:

EPC Art. 56, 83, 111(1)
RPBA 2020 Art. 11

Keyword:

Automatic update and execution of a flight plan based on a
detected runway configuration (technical)
Remittal - special reasons for remittal (yes)

Decisions cited:

T 1741/08



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Case Number: T 0270/20 - 3.5.01

D E C I S I O N
of Technical Board of Appeal 3.5.01
of 19 June 2023

Appellant: The Boeing Company
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 13 November
2019 refusing European patent application No.
17382762.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman M. Höhn
Members: L. Falò
D. Rogers

Summary of Facts and Submissions

- I. This is an appeal against the examining division's decision to refuse European patent application No. 17382762.7.
- II. The application was refused on the ground of lack of inventive step (Article 56 EPC) of the sole request in view of common general knowledge.
- III. In the statement setting out the grounds of appeal, the appellant requested that the decision under appeal be set aside and a patent be granted on the basis of the main or first auxiliary request, filed therewith. The main request essentially corresponds to the one on which the decision was based. There was a further auxiliary request for oral proceedings.
- IV. In the communication accompanying the summons to oral proceedings, the Board set out its preliminary view that it disagreed with the examining division's assessment of technicality, and that it was minded to remit the application to the department of first instance for further prosecution.
- V. In a letter of reply dated 11 October 2022, the appellant withdrew the request for oral proceedings and agreed that the case be remitted to the first instance. The oral proceedings were subsequently cancelled.
- VI. Claim 1 of the main request reads:

A computer-implemented method for updating an aircraft flight plan, comprising:

retrieving (210) recorded surveillance data (214) including instances of aircraft positions (216) at an airport;

determining (220) a plurality of three-dimensional surveillance cells (302) at each end (310a, 310b) of at least one runway (102) of the airport;

computing (230) a count of a number of aircraft positions (216) within each surveillance cell (302);

determining (240) a current configuration for each runway (102) based on the count computed for the surveillance cells (302) of the runway (102);

updating the flight plan of an aircraft based on the current runway configuration of the airport; and

autonomously executing, by a system installed onboard the aircraft, the updated flight plan (1330).

VII. Claim 1 of the first auxiliary request differs from the main request by the addition, at the end of the claim, of the following features:

wherein the step of determining (220) surveillance cells comprises:

retrieving (602) information on a spatial arrangement of the airport runways;

defining (604) a three-dimensional mesh (500) on the airport, the mesh being formed by a set of mesh cells (502); and

selecting (606) the surveillance cells (302) from among the mesh cells (502).

VIII. The appellant's arguments can be summarised as follows:

All the features of claim 1 had a technical character. Their technical effect was to update and execute the flight plan of an aircraft based on a current runway configuration. Since the flight plan was autonomously executed by an on-board system, the invention had a direct impact on the flight performance of the aircraft. The invention could not be considered a mere "resource scheduling and traveling salesman problem", because it required the determination of the runway configuration and the subsequent modification of the aircraft flight path.

Reasons for the Decision

1. The invention concerns the automatic update and execution of an airplane flight plan on the basis of the configuration of runways at a departure or destination airport (page 6, lines 5 to 12). While an early determination of the runway configuration can improve the efficiency of a flight plan, not all airports publish and regularly update this information. Known methods for estimating the runway configuration are computationally expensive, as they require the tracking and geometric modeling of the arriving and departing flights (description, page 1, lines 11 to 24).

To overcome these problems, a computer determines the current runway configuration using the airport's surveillance data (for example, data provided by the automatic dependent surveillance-broadcast system or secondary radars), by defining a three-dimensional mesh centered on the airport and counting the number of airplanes in each cell of the mesh for a given time period (page 2, lines 5 to 20). A system installed on the aircraft then calculates and autonomously executes a new flight plan on the basis of the determined runway configuration (page 13, line 28 to page 14, line 11).

2. The examining division took the view that claim 1 of the sole request was a straightforward implementation of non-technical features on a general purpose computer.

In particular, the determination of the runway configuration was not considered technical, as it consisted of purely algorithmic techniques applied to data retrieved from well-known sources (e.g. radars). Determining the direction in which to land or start and calculating the shortest way to get there merely reflected a "resource scheduling and traveling salesman approach".

Furthermore, the examining division interpreted the expression "*autonomously executing, by a system installed on-board the aircraft, the updated flight plan*" as merely indicating the display of the updated flight plan to the pilot, and therefore a presentation of information with no technical effect. It appears that this interpretation was based on the consideration that, in normal operation of the flight management system (FMS), "the execution of the flight plan means to display the flight plan to the pilot" (see decision,

point 1.1.1). Since the actual route followed by the aircraft depended on the pilot's intervention or reaction to the updated plan, the division argued the presence of a "broken technical chain" (in the sense of decision T 1741/08 - "*GUI layout/SAP*"), and thus the lack of a direct technical effect on the airplane.

Even when interpreting the autonomous execution of the flight plan as implying a continuous guidance of the airplane, the division was of the opinion that this feature had to be considered as either insufficiently disclosed (Article 83 EPC) or obvious (Article 56 EPC), as the application provided no technical detail as to how this was achieved.

3. In the Board's view, the examining division's interpretation of the execution of the updated plan as a mere display of information is not warranted by the wording of the claim, not even when read in the light of the application as a whole. In particular, no part of the application suggests that the "execution" of the flight plan should be narrowly interpreted as "display".

Moreover, according to the description, the updated flight plan can be transmitted to the Flight Management Unit (FMU) "*for execution (e.g. to carry out an updated flight path or an updated taxiing plan)*" (see page 14, lines 6 to 8). The Board notes that the function of a FMS in modern airplanes is not limited to presenting flight plans to the pilot. It executes a number of functions which include flight planning, navigation, lateral and vertical guidance, and can be operatively connected to the autopilot, to which the calculated steering and thrust commands can be transmitted for execution.

4. In view of the above, the Board is of the opinion that the skilled person would interpret the feature

autonomously executing, by a system installed onboard the aircraft, the updated flight plan (1330)

as implying a continuous and autonomous guidance of the aircraft according to the updated plan. Therefore, the examining division's arguments regarding a possible "broken technical chain" must fail.

The Board is further of the opinion that the skilled person would be able, without undue burden, to program commonly known on-board flight control systems to autonomously execute the updated flight plan. The requirements of Article 83 EPC are therefore respected.

5. The Board agrees with the appellant that the invention does not consist in the computer-based implementation of a resource scheduling or traveling salesman algorithm. Although operational research algorithms may well be involved in the recalculation of the flight plan, they are not even part of the claimed subject matter.
6. While the assignment and update of runway configurations may be considered administrative measures, in the Board's view determining an airport's current runway configuration using computer means and based on surveillance data in the manner described in claim 1 has a technical character.
7. Accordingly, the Board concludes that the examining division erred in considering the subject matter of

claim 1 an obvious implementation of non-technical requirements on a general purpose computer.

All the features of claim 1 have a technical character and synergistically interact to automatically adapt the aircraft's route to the current runway configuration. Hence, they should have all been taken into account for the assessment of inventive step.

8. Under Article 111(1) EPC the Board may either exercise any power within the competence of the examining division or remit the case.

In the present case, it appears from the search report that the search was restricted to a quite remote technical field (G06Q). Although a further document was introduced during examination, since most of the claimed features were considered non-technical, the Board cannot be sure that they have been thoroughly searched.

A further look into prior art seems therefore necessary before assessing inventive step. This constitutes a special reason for remitting the case (Article 11 RPBA 2020).

9. As the decision can be taken on the basis of the main request, the Board does not have to deal with the auxiliary request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance for further prosecution.

The Registrar:

The Chairman:



T. Buschek

M. Höhn

Decision electronically authenticated