BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

A		B		C	X

File Number: T 228/91 - 3.2.1

Application No.: 85 201 285.5

Publication No.: 0 186 220

Title of invention: Nacelle and wing assembly

Classification: B64D 29/02, B64D 27/18

D E C I S I O N
of 27 August 1992

Proprietor of the patent: The Boeing Company

Opponent: Deutsche Airbus GmbH

Headword:

EPC Article 56

Keyword: "Inventive step (yes)"

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 228/91 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 27 August 1992

Appellant : (Opponent)
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Decision under appeal :
Decision of Opposition Division of the European Patent Office dated 11 February 1991 rejecting the opposition filed against European patent No. 0 186 220 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : F. Gumbel
Members : S. Crane
J.-C. de Preter

Summary of Facts and Submissions

I. European patent No. 0 186 220 was granted on 26 April 1989 on the basis of European patent application No. 85 201 285.5.

Claim 1 of the granted patent reads as follows:

"A nacelle/wing combination, comprising:

a. a wing (12) having a leading edge (22), a trailing edge (24), an upper surface (18) and a lower surface (20), said wing having a spanwise axis and a chord line which is a line of maximum distance extending from the trailing edge to the leading edge, said wing having a depth dimension measured between the upper and lower surface on a line normal to camber line of the wing;

b. a nacelle (14) mounted to said wing at a nacelle location and containing a jet engine for propulsion which creates an exhaust flow, said nacelle having an outer circumferential surface which has a rear circumferential edge portion (34) defining an exhaust flow region (52) which is a generally cylindrically shaped space having a cross-sectional configuration corresponding to said rear circumferential edge portion and extending rearwardly from said rear circumferential edge portion in alignment with a path along which engine exhaust from said nacelle flows;

c. said nacelle having a critical upper surface area (54) which comprises an upper surface portion of said nacelle and an upper surface portion of said exhaust flow region, said nacelle being positioned relative to the wing so that the critical upper surface area of the nacelle is below the lower surface of the wing;

d. said rear circumferential edge portion being positioned no further rearwardly than a location that is rearward of the leading edge by a distance equal to 30% of

chord length at the nacelle location; characterized in that

e. said wing (12) having a nacelle critical surface region which is a wing lower surface portion (20) at the nacelle location, said critical surface region being contoured relative to the depth dimension so that peak low pressure along said critical surface region occurs at a location rearward of said wing leading edge by a distance equal to at least 40% of chord length;

f. said wing lower surface portion having an approximately constant degree of curvature from a location at about one tenth of the chord length rearwardly of the wing leading edge to a location at approximately 65% rearwardly of the wing leading edge (22);

whereby said nacelle (14) can be positioned with the critical upper surface area of the nacelle being relatively close to said wing without creating excessive nacelle installation drag."

Dependent Claims 2 to 8 relate to preferred features of the nacelle/wing combination defined in Claim 1.

II. The patent was opposed by the Appellants on the grounds that its subject-matter lacked novelty and/or inventive step with respect to the following state of the art documents:

(D1) Aeronautical Journal, July 1976, pages 277 to 293,
(D2) DE-A-2 712 717, and
(D3) US-A-4 413 796.

III. The opposition was rejected by a decision of the Opposition Division dated 11 February 1991.

IV. An appeal against this decision was filed on 18 March 1991, the appeal fee being paid on the same day. The

Appellants requested that the decision under appeal be set aside and the patent revoked in its entirety.

The Statement of Grounds of Appeal was filed on 10 April 1991. In this Statement reference was made to a further prior art document,

(D4) AGARD Report No. 654, pages 1-1 to 1-30 and 2-1 to 2-17.

V. With a letter dated 18 September 1991 the Respondents (Proprietors of the patent) disputed the availability of document D4 to the public and indicated that even if it were found to belong to the state of the art it should be disregarded as having been late-filed.

As for the substantive issues they referred to the findings in the decision under appeal.

VI. In a communication pursuant to Article 110(2) EPC the Board expressed the provisional view that document D4 belonged to the state of the art but, contrary to the assertion of the Appellants, contained no specific teaching of the features (e) and (f) of granted Claim 1.

VII. With a reply dated 17 June 1992 to this communication the Appellants referred with respect to feature (e) of Claim 1 to a further document,

(D5) US-A-3 952 971

which is mentioned in the specification of the contested patent.

The Respondents filed no reply to the communication.

VIII. The arguments presented by the Appellants in support of their request can be summarised as follows:

The nacelle/wing combination defined in Claim 1 differs from the combinations disclosed in documents D1 (Figure 23) or D4 (pages 1 to 23, Figures 46, 47 and 49) solely by features that were well known in the art and which could not contribute to an inventive step. Thus, features (e) and (f) of Claim 1 were known per se from Figure 9 of document D1, and pages 2-12 and 2-13 of document D4. Furthermore, feature (e) was also disclosed in document D5.

IX. The Respondents contest the arguments of the Appellants and request, by implication, that the appeal be dismissed.

Reasons for the Decision

1. The appeal meets the requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC; it is therefore admissible.

2. Availability of document D4

AGARD Report No. 654 (document D4) - AGARD is an advisory group of NATO - relates to material presented at a course on 28 March to 1 April 1977 and bears a publication date of June 1977. It carries no indication whatsoever that its contents are in any way subject to confidentiality. The Board can therefore see no reason for excluding it from the state of the art according to Article 54(2) EPC, even if, as the Respondents allege, participation at the course itself may have been restricted to certain individuals.

3. Background to the invention

The invention is concerned with the problem of engine nacelle installation drag and in particular with the reduction or elimination of nacelle interference drag, by which is meant the difference in drag of the nacelle/wing combination above the drag of the wing and the nacelle/strut measured separately. This interference drag results from the aerodynamic interference which may occur between the wing, nacelle and strut, particularly when, as is generally advantageous for structural and other reasons, the nacelle is mounted close to the wing.

4. Novelty and inventive step

The preamble of Claim 1 is based on US-A-4 314 681, which is mentioned in the introductory description of the patent specification. This document also relates to the reduction of nacelle interference drag and proposes in this respect a particular assymmetric form of nacelle support strut. the document contains no information on the configuration of the wing lower surface comparable to features (e) and (f) of the characterising clause of present Claim 1.

Nacelle/wing combinations displaying all the features of the preamble of Claim 1 are also to be seen in Figure 23 of document D1 and Figures 46, 47 and 49 on page 1-23 of document D4. The passages of documents D1 and D4 relating to these figures are of a very general character and indicate merely that at the relevant date of the patent considerable attention had been paid to the problem of minimising nacelle installation drag. It is not possible to derive from those passages any information corresponding to features (e) and (f) of Claim 1.

The subject-matter of Claim 1 is therefore novel.

For the attack of the Appellants on the inventive step of the claimed subject-matter to succeed it would have been necessary as a first stage for them to demonstrate, as they allege, that the features (e) and (f) of Claim 1 were both measures that were known per se in the art. With respect to feature (e) it would indeed appear, particularly when account is taken of document D5, that this is the case. Feature (f) cannot, however, be found in any of the documents cited by the Appellants. In the opposition proceedings they have referred in this respect to documents D2 and D3. From Figure 3 of document D2 substantially constant curvature of the wing undersurface can at most be recognised between about 20% and 50% of the chord length, whereas feature (f) of Claim 1 requires this from between about 10% and 65%. In document D3 the extent of constant curvature A'-P' (Figure 1) is from 12.5% to 25% of the chord length. In any case, there is nothing in these documents that in any way relates the constant curvature of the wing undersurface to a reduction in nacelle installation drag. In the appeal proceedings the Appellants have relied on feature (f) being disclosed by the wing cross-sections shown in Figure 9 of document D1 and on pages 2 - 12 and 2 - 13 of document D4. However, the relevant passages of text relating to these wing cross-sections contain no indication of a substantially constant curvature comparable to that required by Claim 1 and such information is not derivable from the cited drawings themselves.

Accordingly, the Board cannot see that the subject-matter of Claim 1 can be derived in an obvious manner from the cited state of the art.

Order

For the above reasons, it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Fabiani F. Gumbel