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**Datasheet for the decision
of 22 April 2016**

Case Number: T 0089/14 - 3.2.01

Application Number: 07873787.1

Publication Number: 2040980

IPC: B64C9/02, E04C2/292

Language of the proceedings: EN

Title of invention:

METHOD OF FABRICATING AN INTERNAL FINGER JOINT

Patent Proprietor:

The Boeing Company

Opponents:

Airbus Operations GmbH/Airbus Operations SAS (FR)/
Airbus Operations Limited (GB)/
Airbus Operations S.L. (ES)/Airbus SAS (FR)

Headword:

Relevant legal provisions:

EPC 1973 Art. 100(b), 100(a)

Keyword:

Sufficiency of disclosure - (yes)

Inventive step - (yes)

Decisions cited:

Catchword:



Beschwerdekammern
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Case Number: T 0089/14 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 22 April 2016

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 22 November
2013 rejecting the opposition filed against
European patent No. 2040980 pursuant to Article
101(2) EPC.**

Composition of the Board:

Chairman G. Pricolo
Members: Y. Lemblé
 S. Fernández de Córdoba

Summary of Facts and Submissions

- I. The appeal of the Opponents is directed against the decision of the opposition division to reject the opposition against European patent No. 2 040 980.
- II. The patent was opposed under Art. 100(a) and 100(b) EPC 1973. In its decision, the Opposition Division held that the European patent disclosed the invention in a manner sufficiently clear and complete for it to be carried out by the person skilled in the art and that the subject-matter of the patent as granted met the requirements of novelty and inventive step having regard, *inter alia*, to the following prior art documents:
- D0: WO-A-94/10406,
 - D1: US-A-3 539 425,
 - D2: GB-A-2 081 678,
 - D3: DE-B-1 813 661,
 - D4: EP-A-0 275 621,
 - D5: WO-A-01/94236.
- III. In the oral proceedings held on 22 April 2016 the Appellants requested that the decision under appeal be set aside and that the patent be revoked. The Respondent (Patent Proprietor) requested the dismissal of the appeal.
- IV. Independent claim 1 as granted reads as follows (delimitation of features as proposed by the opposition division):
- A method of fabricating an item for an aerospace vehicle, the method comprising:
- 1.1 fabricating a first joint in a panel (10),
wherein fabricating the first joint comprises:

- 1.1.1 fabricating a groove (18) in the panel, the panel comprising a first skin (12), second skin (14), and core (16), the core being sandwiched between the first skin and the second skin, the groove passing through the first skin and at least a portion of the core, characterized in that:
- 1.1.2 the groove (18) comprises a set of tabs (20A to 20n) and a corresponding set of slots (22A to 22n), and the groove delineates a first portion of the panel (10A) from a second portion of the panel (10B); and that the method further comprises;
- 1.1.3 bending the panel along the groove (18), wherein the first portion (10A) and the second portion (10B) intersect at an angle at the groove (18), wherein the set of tabs (20A to 20n) intermesh with the set of slots (22A to 22n) in response to bending the panel (10) along the groove; and
- 1.2 fabricating a second joint, wherein the second joint substantially retains the angle of the first joint.

V. The Appellants' submission may be summarised as follows:

The patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by person skilled in the art Article 100(b) EPC. Independent claim 1 defined fabricating an item with a first joint by bending a panel and fabricating a second joint, wherein "the second joint substantially retains the angle of the first joint" (feature 1.2). There was no disclosure of such a second joint in the patent specification. Even paragraphs [0035] to [0036] and Fig. 22-23 of the patent specification, which was alleged by the Respondent and the Opposition Division

to disclose feature 1.2, remained silent about any "second joint". What actually had to be understood under the second joint which retained the angle of the first joint was therefore fully unclear to the skilled person.

Under the assumption that the joints 24E to 24H mentioned in paragraph [0036] were "second" joints, it was not disclosed how these second joints were actually fabricated. The half sentence in paragraph [0036]: "the joints 24A to 24H may be fabricated according to any embodiment disclosed herein" could not resolve the lack of disclosure. Namely, whereas the joints 24A to 24D were "first" joints in the sense of claim 1, this was not possible for the joints 24E to 24F, because they were obtained by completely cutting out portions of the panel and did not comprise "a groove passing through the first skin and at least a portion of the core" (feature 1.1.1).

Also, the function of a single second joint which, as claimed, "substantially retains the angle of the first joint" had not been sufficiently disclosed. From paragraph [0036] it might be derived that the (second ?) joints 24E to 24H retained the sub-panels 10B to 10E in their relative positions with respect to each other and with respect to the sub-panel 10A. The technical teaching which might be derived from this sentence was that all second joints 24E to 24H in connection with all sub-panels 10B to 10E cooperatively retained the angles of all first joints 24A to 24 D. There was absolutely no teaching of how a single second joint of undefined nature without any additional sub-panel could per se retain the angle of a first joint between two panel portions. By claiming a delocalized second joint and defining it by its function only, the claim encompassed a huge number of possible variants which, as a whole, did not solve the technical problem

of enhancing the stiffness of the fabricated first joint (see page 6, first paragraph of the attacked decision). Due to the undisclosed nature of the second joint, the opposed patent had therefore to be revoked in accordance with Article 100(b) EPC.

The problem of the undisclosed nature of the second joint and about the relationship between the first and second joints was even increased by dependent claim 9 which defined the step of fabricating a third joint wherein "the first joint is disposed between the second joint and the third joint to substantially retain the angle of the first joint". The terms "disposed between" implied a local distance between the second and the third joint, which was nowhere described in the opposed patent. Moreover, there was no disclosure throughout the patent specification of what actually had to be understood under the term "third joint" and how the first joint might be disposed between the second joint and the third joint. Due to the undisclosed nature of the third joint, the opposed patent had also to be revoked according to Article 100(b) EPC.

The subject-matter of claim 1 as granted lacked an inventive step (Article 100(a) EPC) having regard to the following combinations of documents D0 with D1, D0 with D2, D0 with D3, D0 with D4, and the combination of D5 with any of the documents D1-D4.

D0 represented the closest prior art. Claim 1 of the patent specification had not been correctly delimited with respect to that prior art and a correct delimitation was shown in Annex IA joined to the statement setting out the grounds of appeal. Starting from the method known from D0 and taking into account this correct delimitation, the technical problem was the following: to improve the method according to the

preamble of the claim such that the fabricated item presented an increased stability.

Faced to this technical problem when implementing the method of D0, the person skilled in the art would consider the technical teaching of prior art document D2 which disclosed a method of fabricating a folding protective corner piece from a blank (panel) of lightweight foamed plastic materials (see Fig. 2; page 1, first paragraph of document). The blank of D2 had at least two flat portions hinged together and included means which intermeshed when the blank was folded to retain it in its desired shape. More particularly, D2 disclosed one or more projection(s) 6 and a corresponding set of complementary recess(es) 7 into which the projection(s) 6 meshed in response to bending the blank panel. These projections and recesses conferred stability to the folded piece (see Figure 6 and page 1, lines 51-56; claims 4 and 7). The skilled person would therefore combine D0 and D2 in order to solve the above-mentioned problem. Additionally, D2 disclosed in Fig. 6 a second joint 8,9 which retained the angle of the adjacent first joint (page 1, lines 57-60). Therefore, document D2 disclosed all the missing features of the characterizing portion of independent claim 1. Consequently the subject matter of independent claim 1 lacked an inventive step regarding a combination of prior art documents D0 and D2.

Alternatively, a person skilled in the art faced with the above mentioned technical problem when starting from document D0, would also consider the technical teaching of document D1 which disclosed a method of assembling the walls of a box-like structure. Although prior art document D1 did not refer to a structure having a core and two skin layers, the person skilled

in the art would still consider D1 for achieving the object of claim 1, because the lightweight box-like structures disclosed therein were suitable for an aerospace vehicle and because document D1 related to the problem of stabilizing a joint between two bent panels (see col. 1, last paragraph of document D1). Document D1 disclosed the characterising features of claim 1 when the latter was properly cast in two-part form. In particular, the tabs in prior art document D1 were realized by the dovetail tenants 32, and the slots were realized by the dovetail slots 33 formed in a groove above and on the carrier strip 7 which had the function of the claimed second skin (see figures 4-5 and description in column 4, lines 23 - 32). Figure 6 showed the situation after bending and gluing steps with intermeshing tenants 32 and slots 33. Having recognized from document D1 that a groove structured in intermeshing tabs and slots stabilized the joint of document D0, the person skilled in the art would consider to machine the groove of document D0 with such intermeshing tabs and slots known from document D1 and arrive at the missing features of claim 1. Considering feature 1.2, it was also obvious for the person skilled in the art to provide an additional arbitrary second joint in order to further stabilize the first joint such that the angle of the first joint was retained. Such a second joint was even explicitly disclosed in document D1 in form of the front wall 18 and the bottom wall 19a (see col. 3, last paragraph to col. 4, first paragraph of document D1).

In the same manner, a person skilled in the art faced with the above mentioned technical problem when starting from document D0, would consider the technical teaching of document D3 which disclosed a method of forming a straight box having walls of compressed wood.

Such a light-weight compressed wood box structure was suitable for an aerospace vehicle. Although prior art document D3 did not explicitly refer to a structure having a core and two skin layers, the person skilled in the art would still consider document D3 for solving the above-mentioned problem. Document D3 disclosed all the missing features of independent claim 1. In particular, there were recesses 16 and projections 17 in a V-groove above a cover skin 20 which recesses 16 and projections after bonding along the V-groove (see figure 5 of document D3) intermeshed with each other. The step of fabricating a second joint was also disclosed in document D3 because the wall connections of the walls 11,14 and 14,12 and 12,13 stabilized the first joint between walls 11 and 13. Consequently, the subject matter of independent claim 1 lacked an inventive step regarding the combination of prior art documents D0 and D3.

Further, a person skilled in the art faced with the above mentioned technical problem when starting from document D0, would consider the technical teaching of document D4 which disclosed a method of forming a fold-up corner piece for a spacer tube assembly. Although document D4 did not refer to a structure having a core and two skin layer, the person skilled in the art would consider document D4, because it was concerned with retaining a folded piece in the desired angular relationship (column 2, line 37-40). Document D4 disclosed the missing features of independent claim 1. In this respect, reference was made to figures 1-2 and corresponding description in column 3, line 55 to column 5, line 49. In particular, the tabs were realized in D4 by fins 28 on a hinge portion 24 which had the function of the claimed second skin and the slots were realized by the space between corresponding

fins 26 (see figure 1 of D4). After bending the fins 26,28 intermeshed with each other according to feature 1.1.3 of claim 1. It was also obvious for the person skilled in the art to provide an additional arbitrary second joint in order to further stabilize the first joint such that the angle of the first joint was retained (feature 1.2). Consequently, the subject matter of independent claim 1 lacked an inventive step having regard to a combination of prior art documents D0 and D4.

Document D5 showed a method of fabricating an item for an aerospace vehicle which was similar to that of document D0. Thus, using an analog argumentation as regarding the combinations of prior art document D0 and any of prior art documents D1 to D4 (see above), the subject matter of independent claim 1 lacked an inventive step in view of a combination of prior art documents D5 and any of prior art documents D1 to D4.

VI. The counter-arguments of the Respondent may be summarised as follows:

At least one way of disclosing the invention was provided in the patent. When considering figures 22 and 23 of the patent, the skilled person would understand that, in the process of moving from the pre-cut, pre-grooved panel of figure 22 to the item shown in figure 23, the sub-panels 10B to 10E shown in figure 22 were folded in turn, thereby forming joints 24A to 24H shown in figure 23. During the intermediate stages between figures 22 and 23, a situation was reproduced in which there was a first joint and a second joint, the second joint substantially retaining the angle of the first joint. Thus, the patent did disclose the invention in a

manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

The conclusion of the Opposition Division as regards the question of inventive step and taking into consideration the combination of documents as cited by the Appellants (combinations D0/D1, D0/D2, D0/D3, D0/D4 and D5/D1, D5/D2, D5/D3, D5/D4) should be confirmed.

Reasons for the Decision

1. The appeal is admissible.
2. Sufficiency of disclosure (Art. 100 (b) EPC 1973)

The Appellants mainly contend that feature 1.2 of claim 1, i.e. the fabrication of a second joint which can substantially retain the angle of the first joint, is not disclosed in the patent and, therefore, cannot be carried out by a skilled person.

The Board does not agree. The question of the sufficiency of disclosure is to be considered taking into account the whole content of the patent specification (T 14/83, OJ 1984, 105). Paragraphs [0035] and [0036] and Fig. 22-23 of the patent specification clearly explain how (at least) a second joint can retain the angle of an adjacent (first) joint. In Fig. 23 of the patent specification is shown an item including joints 24A to 24 H, whereby this item is obviously made from the "pre-cut and pre-grooved panel blank" of Fig. 22 (see column 4, lines 14-18 and lines 23-25: identical reference numerals for sub-panels 10A to 10E). Paragraph [0036] of the patent specification mentions that "the joints 24A to 24H may

be fabricated according to any embodiment disclosed therein. According to a particular embodiment, the joints 24A to 24D may be fabricated without adhesive due to the stabilizing effects of the joints 24E to 24H. That is, the joints 24E to 24H retain the sub panels 10B to 10E in their relative positions with respect to each other and with respect to the sub panel 10A".

As shown in Fig. 22 and mentioned in column 4, lines 14-15 of the patent specification, the joints 24E-24H are generated by cuts in the panel while the other joints 24A to 24D (first joints within the meaning of the claim) are generated by grooves (see also [0002] of the patent specification). These cuts comprise intermeshing tabs and slots as disclosed in other embodiments of the patent specification. Such joints are able to absorb shear, twisting and/or tension loads as mentioned in the patent. Looking at Fig. 23 of the patent specification, the skilled person recognises, taking into account his common general knowledge, that there is a stabilizing interaction between the joints, such that each joint has the effect of retaining the angles of adjacent joints. This effect already occurs with two adjacent joints as claimed in claim 1, for example the joints 24A and 24E (first and second joints of claim 1), but also with a central joint 24A disposed between a second 24E and a third 24H adjacent joints (first joint disposed between a second and a third adjacent joints as mentioned in claim 9). When the expression "fabricating a second joint" (feature 1.2) is interpreted on the basis of Fig. 22-23 and paragraph [0036] of the patent specification, it is clear that it refers to a second joint of the panel in which the first joint is fabricated. Thus, the patent discloses at least one way of carrying out feature 1.2 and, thus, the claimed method.

3. Inventive step (Art. 56 EPC 1973)
 - 3.1 Starting from document D0 (see Fig. 4; page 14, third paragraph) as nearest prior art, the Board can agree with the delimitation of claim 1 in the two-part form as proposed by the Appellants (see Annex IA). Accordingly, the subject-matter of claim 1 is distinguished from the the method of D0 by the following features:
 - 1.1.2b the groove comprises a set of tabs and a corresponding set of slots;
 - 1.1.3b the set of tabs intermesh with the set of slots in response to bending the panel (10) along the groove; and that the method further comprises:
 - 1.2 fabricating a second joint, wherein the second joint substantially retains the angle of the first joint.
 - 3.2 Taking into account the effects achieved by the distinguishing features, the objective technical problem can be formulated as follows: to improve the method as defined in the preamble of claim 1 such as to fabricate an item with an enhanced stability versus weight ratio.
 - 3.3 The Board does not share the view of the Appellants in respect of the combination D0/D2. The method for fabricating a foldable protective article in D2 is not adapted for a panel as defined in D0 and comprising a first skin, second skin and a core as claimed. The panel of D2 is fabricated as a one-piece foamed plastics moulding (see claim 2) by compressing corresponding areas of the plastics blank immediately after foaming while the blank is still warm (see claim 9 depending from claim 2). The application of this

fabrication method to an item having a first skin and a second skin as known from D0 cannot lead to a groove "passing through the first skin" (see feature 1.1.1 of claim 1) and having tabs and slots. Moreover, the Board does not follow the Appellants when they allege that D2 would suggest a skilled person who seeks to enhance the stability of the item, to form a set of tabs and a corresponding set of slots when fabricating the groove. D2 does not fabricate any groove passing through a blank but directly forms hinges 5, projections 6, 8 and recesses 7, 9 by compression of the moulded blank. D2 also does not specifically mention stability as an object to be achieved by the protective article described in D2 but only refers to the possibility of folding the foamed protective article when it will be used in order to save volume for transportation and storage (column 1, lines 3-19).

3.4 Also the combination D0/D1 cannot lead in an obvious way to the method of claim 1. Contrary to the opinion of the Appellants, D1 does not disclose in Figs. 5 and 6 a method comprising feature 1.1.3, i.e. a method wherein "the set of tabs intermesh with the set of slots **in response to bending the panel** along the groove". Figures 5-6 of D1 show dovetails tenons 32 and dovetails slots 33 made at each end of two adjacent and separate panels 30, 31 and no groove fabricated in one and a single panel and delineating this panel in two panel portions. In fact, the inventor of D1 never contemplated that the tenons 32 and slots 33 intermesh in response to bending of a single panel: this is confirmed by the embodiment of Fig. 7-8 of D1 which shows two separate panels 34, 37 of which respective projection 35 and recess 36 cannot interengage without partly removing the backing strip 7.

- 3.5 In the same way, the combination D0/D3 cannot lead to the method of claim 1. The method for fabricating a joint in D3 is not adapted for a panel as defined in D0 and comprising a first skin, second skin and a core as claimed. The joint disclosed in D3 is obtained by joining two independent -separate- panels or plate of plywood. D3 makes use of projections 18 and recesses 16 in order to solve the problem of mounting these two panels in a correct position not only with respect to a longitudinal direction of the joint but also in respect of their relative angular position by merely displacing them along the longitudinal direction the joint (column 1, lines 39-47). This teaching is totally irrelevant to the problem as formulated above.
- 3.6 The same conclusion is reached in respect of the combination D0/D4. Document D4 refers to a corner piece for a spacer tube used to separate the panes of a multiple panes glazed unit. D4 does not show a groove made in a panel. It has nothing to do with the fabrication of items for an aerospace vehicle as defined in and known from D0 and it is of no help for a skilled person seeking to improve the method of D0. Furthermore, it is noted that the angle made by the two arms 12 after they are pivoted around the hinge 24 (see Fig. 1-2 of D4) is retained by friction (see feature c) of claim 1 in D4), Further, there is nothing like a second joint in this document (feature 1.2).
- 3.7 Starting from the method shown in D5, which, as admitted by the Appellants, is analogous to that shown in D0, the same reasoning as mentioned above with respect to the combination with any of the documents D1-D4 applies.

3.8 The Board therefore concludes that the subject-matter of claim 1 involves an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated