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Datasheet for the decision of 26 September 2014

Case Number: T 1240/13 - 3.2.08

Application Number: 07116776.1

Publication Number: 1903221

IPC: F16B19/05, F16B5/02, F16B35/04

Language of the proceedings: EN

Title of invention:
Sleeved interference fasteners for composite materials

Patent Proprietor:
Alcoa Global Fasteners, Inc.

Opponent:
Lisi Aerospace

Headword:

Relevant legal provisions:
EPC Art. 100(a), 100(b), 100(c), 84, 123(2), 54, 56
RPBA Art. 13(1), 13(3), 15(1)

Keyword:
Novelty - main request (no)
Claims - clarity - auxiliary request (yes)
Inventive step
Late-filed auxiliary requests - admitted (yes)

Decisions cited:

Catchword:

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Case Number: T 1240/13 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 26 September 2014

Appellant: (Patent Proprietor)	Alcoa Global Fasteners, Inc. 3000 West Lomita Boulevard Torrance, California 90505 (US)
Representative:	Trinks, Ole Meissner, Bolte & Partner GbR Widenmayerstraße 47 80538 München (DE)
Appellant: (Opponent)	Lisi Aerospace Tour Gamma A 193 Rue de Bercy 75012 PARIS (FR)
Representative:	Blot, Philippe Robert Emile Cabinet Lavoix 2, place d'Estienne d'Orves 75441 Paris Cedex 09 (FR)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 22 March 2013 concerning maintenance of the European Patent No. 1903221 in amended form.**

Composition of the Board:

Chairman	I. Beckedorf
Members:	M. Foulger
	M. Alvazzi Delfrate

Summary of Facts and Submissions

I. Appellant I (opponent) lodged an appeal against the interlocutory decision of the Opposition Division which was dispatched on 22 March 2013. The Opposition Division held that account being taken of the amendments made by the patent proprietor during the opposition proceedings, the patent and the invention to which it related, in the version according to then valid second auxiliary request, met the requirements of the EPC. In particular, the subject-matter of the independent claim 1 was found to be new and inventive over the cited documents. Moreover, the grounds of opposition according to Articles 100(b) and (c) EPC did not prejudice the maintenance of the patent in this amended form.

Appellant II (patent proprietor) likewise lodged an appeal against said decision.

Both appeals were duly filed and reasoned.

II. Oral proceedings took place before the Board of Appeal on 26 September 2014. At the beginning of the oral proceedings, appellant II withdrew its main request (patent as granted) and first auxiliary request filed with letter of 26 August 2014. The subsequent requests filed with the aforementioned letter were renumbered accordingly and discussed with the parties.
For the course of the oral proceedings, reference is made to the minutes of the oral proceedings.

III. The parties' final requests

Appellant I requested
that the decision under appeal be set aside

and
that the European patent No. 1903221 be revoked
and
that the appeal of appellant II be dismissed.
Appellant II requested
that the decision under appeal be set aside
and
that the patent be maintained in amended form on the basis of one of the sets of claims filed as second auxiliary request (new main request) and as third to seventh auxiliary requests (new first to fifth auxiliary requests), all filed with letter of 26 August 2014
and
that the appeal of appellant I be dismissed.

IV. The following documents are referred to in this decision:
D2 : US 4,102,030 A
A7 : US 4,850,771 A
A9 : US 5,176,481 A
A10 : US 4,557,033 A
A15 : EP 0 248 122 A
A16 : HUCK Engineering Standards, page nos. SK12296-1, SK12296-2, SK12296-3, SK12296-4, SK12296-5
A17 : "Huck Aerospace Fasteners for Composite Structures" brochure

V. Claim 1 of the new main request (hereinafter: the main request) reads:

"A sleeved interference fastener (10) adapted to be installed in aligned holes (125, 130) through two or more workpieces (105, 110), the sleeve interference fastener (10) comprising:
- a sleeve member (20) having an enlarged head (85) at

one end and a tubular portion (80), the tubular portion (80) having an inner diameter (90) and an outer diameter (95), wherein the outer diameter (95) of the tubular portion (80) is foreseen to be less than an inner diameter of the aligned holes (125, 130) of the structure (105, 110); and

- a pin member (15) having an enlarged pin head (35, 37) at one end, a threaded portion (50) at an opposite end, and a smooth cylindrical shank portion (45) therein between, wherein the smooth shank portion (45) is located below the enlarged pin head (35, 37) and has a diameter greater than the inner diameter of the tubular portion (80) of the sleeve member (20),

wherein the sleeve member (20) is adapted to expand radially over the smooth cylindrical shank portion (45) to form an interference fit between the outer diameter of the sleeve member (20) and the aligned holes (125, 130) through the two or more workpieces (105, 110) so as to provide an installed position of the sleeve interference fastener (10),

characterized in that

the fastener (10) further comprises a transition portion (55) between the smooth cylindrical shank portion (45) and the threaded portion (50), the transition portion (55) having a configuration that allows a reduction in the radius between the smooth cylindrical shank portion (45) and the threaded portion (50) of the pin member (15) for minimizing the installation force required for installing the pin member (15) into the sleeve member (20), wherein the coefficient of friction between the inner surface of the sleeve member (20) and the smooth cylindrical shank portion (45) of the pin member (15) is so chosen as to be less than the coefficient of friction between the outer surface of the sleeve member (20) and the inside diameter surface (135) of the aligned holes (125, 130)

through the two or more workpieces (105, 110) in order to reduce the amount of stretch of the sleeve member (20) thereby allowing the smooth cylindrical shank portion (45) to expand the sleeve member (20) into an interference fit with the two or more workpieces (105, 110)."

VI. Claim 1 of the new first auxiliary request (hereinafter: the first auxiliary request) is based on claim 1 of the main request with the additional features:
"wherein the transition portion (55) is a tapered transition portion having an angle less than or equal to 20 degrees from the smooth cylindrical shank portion (45) as the diameter decreases radially from the smooth shank portion (45) to the threaded portion (50)."

Independent claim 2 of the first auxiliary request is based on claim 1 of the main request plus the features:
"wherein the transition portion (55) is a transition portion having a length of between 0.254 mm (0.010 inches) and 0.737 mm (0.0290 inches), the diameter of the transition portion decreasing radially between 0.102 mm (0.004 inches) and 0.127 mm (0.005 inches) as it extends from the smooth cylindrical shank portion (45) to the threaded portion (50)."

VII. The independent claim of the new second auxiliary request (hereinafter: the second auxiliary request) is based on claim 1 of the main request with the additional features:
"wherein the transition portion (55) is a tapered transition portion having an angle less than or equal to 20 degrees from the smooth cylindrical shank portion (45) as the diameter decreases radially from the smooth shank portion (45) to the threaded portion (50), and

wherein the inner surface of the sleeve member (20) is coated with a low friction coating to reduce the amount of friction as the smooth cylindrical shank portion (45) of the pin member (15) enters the sleeve member (20)."

VIII. The other auxiliary requests do not play a part in this decision.

IX. Appellant I argued essentially as follows:

Main request

That the subject-matter of the independent claim 1 of the main request was not new with respect to A7. Fig. 1a of this document showed a fastener with a sleeve and a pin. The pin comprised a threaded portion and a smooth shank portion. These two portions were connected by a transition portion. That the sleeve member was adapted to expand radially to form an interference fit with the workpieces was described in A7, col.4, l. 44-49. Furthermore, all features relating to the workpieces in claim 1 should be ignored because the workpieces were not part of the claimed subject-matter. Moreover, the term "minimizing" in claim 1 was not clearly defined. Furthermore, that if the sleeve expanded as described then the coefficients of friction must also be as claimed.

First auxiliary request

The first auxiliary request was not admissible because it contained an independent claim that had been replaced in proceedings before the opposition division; this claim must therefore be regarded as being abandoned. Furthermore the request was late-filed.

Moreover the subject-matter of independent claims 1 and 2 of this request did not involve an inventive step with regard to A7 and the knowledge of the person skilled in the art. The paragraph of the patent, from which the amendments to the independent claims was taken did not specifically relate the claimed features to any technical effect. Hence as there was no technical effect then the subject-matter of the independent claims did not involve an inventive step. Moreover the distinguishing features were arbitrary and accessible to the skilled person without involving any inventive step.

Second auxiliary request

This request was late-filed and consequently was not be admitted into the proceedings.

The content of claim 1 went beyond that of the application as originally filed because the low friction coating was only disclosed in combination with a rough outer sleeve surface.

Claim 1 was not clear because the term "low friction" was a relative term and thus unclear. Moreover, the patent specification [0043] mentioned both a sealant and a low friction coating and thus implied that the sealant could not be the low friction coating. D2 showed that a sealant when wet could act as a low friction coating. Thus this lead to a contradiction which meant that the claim was not clear. Moreover A9, column 2, lines 20-28 showed that the boundary between "lubrication" and "coating" was not clear. A10, column 7, lines 44-61 moreover illustrated that there was no clear distinction between "coating" and "lubricant".

Furthermore the subject-matter of claim 1 did not involve an inventive step with respect to A7 as closest prior art in combination with A10 and the knowledge of the person skilled in the art. Although A10 disclosed a fastener with a split sleeve, it was clear that the teaching of A10 was intended to extend to non-split sleeves, Appellant I referred to column 1, lines 45-47 in this respect.

Alternatively, the subject-matter of claim 1 did not involve an inventive step with respect to A16/A17 as closest prior art in combination with A7/A15, A10 and the general knowledge of the person skilled in the art. A16/A17 were to be regarded as state of the art and as a single document. A17 was state of the art because it had a printing date well before the priority date of the contested patent and was a brochure such as would be freely distributed to potential clients. Moreover A17 was published by the company "HUCK" which now belongs to Appellant II so that it would up to Appellant II to disprove the availability to the public of A17. A17 stated that "Engineering standards pages are available on request"; this clearly referred to A16 because the product references corresponded in these documents.

A17 disclosed all features of claim 1 except that the pin has a threaded portion, the transition portion is a tapered transition portion having an angle less than or equal to 20 degrees from the smooth cylindrical shank portion as the diameter decreases radially from the smooth shank portion to the threaded portion,
and in that the inner surface of the sleeve member is coated with a low friction coating to reduce the amount of friction as the smooth cylindrical shank portion of

the pin member enters the sleeve member.

That the pin could have either a threaded portion or a grooved portion in accordance with circumstances was shown by A7 or A15. The feature that the inner surface of the sleeve member is coated with a low friction coating to reduce the amount of friction as the smooth cylindrical shank portion of the pin member enters the sleeve member, was made obvious by A10 or the knowledge of the person skilled in the art. The taper angle was likewise made obvious by the knowledge of the person skilled in the art, as argued for the first auxiliary request.

The subject-matter of claim 1 of the second auxiliary request did not therefore involve an inventive step.

X. Appellant II argued essentially the following:

Main request

When analysing claim 1 it was not correct to ignore all features relating to the workpieces. The transition portion defined in claim 1 had a double function - firstly to connect the shank with the threaded portion - and secondly to expand the sleeve radially. It was emphasized that the transition portion defined in claim 1 had a configuration which allowed the installation force required for installing the pin member to be minimised. This differed from the fastener of A7 because in A7 the shank did not contact the sleeve and the coefficient of friction was not chosen as defined in the claim. Moreover the materials disclosed in A7 did not lead to the coefficients of friction defined in the claim. Therefore the subject-matter of claim 1 was novel over A7.

First auxiliary request

The request was to be admitted into the proceedings because the claims had been modified with regard to the claims filed with the statement of grounds of appeal in order to take account of issues raised by the Board in the communication according to Article 15(1) RPBA. This request contained different claims compared with the request replaced in proceedings before the opposition division.

The subject-matter of claims 1 and 2 of this request was both new and inventive with regard to the cited documents. If A7 were to be taken as the closest prior art and as disclosing all features of claim 1 of the main request then the technical effect of the characterising features, which relate to the transition portion, would be to diminish sleeve stretch compared with the "bull nose" geometry of the prior art. During the oral proceedings, drawings illustrating the technical effects of the invention were referred to. The problem to be solved could then be formulated as being to improve the fastener of A7 so as to allow longer grip lengths without diminishing sleeve strength and avoiding premature sleeve failure. There was no motivation in the cited prior art for the person skilled in the art to modify A7 to arrive at the claimed fastener.

Second auxiliary request

The request was to be admitted into the proceedings because the claims had been modified with regard to the claims filed with the statement of grounds of appeal in order to take account of issues raised by the Board in

the communication according to Article 15(1) RPBA.

The additional features of this claim were taken from paragraph [0042] of the application as originally filed so that the requirements of Article 123(2) EPC were met.

Claim 1 was clear because the term "low friction coating" had a generally recognised meaning. There was furthermore no contradiction with the terms used in the description.

Moreover its subject-matter involved an inventive step over the prior art cited, in particular it was not obvious to combine the teachings of A10 with either A7 or A17 because A10 concerned a different arrangement with a reusable mandrel rather than a pin which was part of the fastener.

A16 and A17 were not to be regarded as prior art because Appellant I had produced no evidence to that effect. Appellant I had not indicated when or how these documents were obtained. The burden of proof had not therefore been discharged by Appellant I. Even if these documents were to be regarded as state of the art then the subject-matter of claim 1 would involve an inventive step.

Reasons for the Decision

1. The appeals are admissible.

2. Main request

2.1 Interpretation of claim 1

The Board considers that it is not correct to ignore the features relating to the workpieces in claim 1 as suggested by Appellant I. However claim 1 unambiguously defines the fastener as comprising a sleeve member and a pin member. The fastener is, according to the claim, "adapted to be installed in aligned holes through two or more workpieces". This can only be interpreted as meaning that the fastener is merely suitable for being installed in the holes through the workpieces, since the workpieces themselves are not part of the claimed fastener.

2.2 Novelty

2.2.1 A7 discloses the features of the preamble of claim 1:

a sleeved interference fastener **(10)** adapted to be installed in aligned holes through two or more workpieces, the sleeve interference fastener **(10)** comprising:
- a sleeve member **(18)** having an enlarged head **(flange 32)** at one end and a tubular portion **(30)**, the tubular portion **(30)** having an inner diameter and an outer diameter, wherein the outer diameter of the tubular portion is foreseen to be less than an inner diameter of the aligned holes **(see fig. 1a)** of the structure;

and
- a pin member **(16)** having an enlarged pin head **(22)** at one end, a threaded portion **(26)** at an opposite end, and a smooth cylindrical shank portion **(24)** therein between, wherein the smooth shank portion **(24)** is located below the enlarged pin head and has a diameter greater than the inner diameter of the tubular portion of the sleeve member **(see fig. 1a and column 3, lines 40-44),** wherein the sleeve member is adapted to expand radially over the smooth cylindrical shank portion to form an interference fit between the outer diameter of the sleeve member and the aligned holes through the two or more workpieces so as to provide an installed position of the sleeve interference fastener **(see fig. 1a and column 4, lines 44-47).**
Therefore the features are the preamble of claim 1 are known from A7.

2.2.2 The remaining features of claim 1 relating to the transition portion and the coefficients of friction are discussed below.

2.2.3 Transition portion

The Board considers that A7 discloses the following features of A7 relating to the transition portion:
the fastener **(10)** further comprises a transition portion **(the conical portion shown in fig. 1a)** between the smooth cylindrical shank portion **(24)** and the threaded portion **(26),** the transition portion having a configuration that allows a reduction in the radius between the smooth cylindrical shank portion and the threaded portion of the pin member for minimizing the installation force required for installing the pin member into the sleeve member **(as can be seen in fig. 1a the threaded portion (26) has a smaller diameter**

than the smooth portion (24)).

The Board is not convinced by the argument that the transition portion of A7 was not "for minimizing the installation force required for installing the pin member (15) into the sleeve member" as claimed. The reason being that the term "minimizing" is clearly meant in the sense of reducing as far as practical because the claim covers embodiments, e.g. a taper of 10°, that reduce more than other embodiments, e.g. a taper of 15°. Thus it is clearly not meant in the sense of providing an absolute minimum value. Therefore whilst the transition portion described in the contested patent would reduce the installation force compared to A7, the transition portion of A7 would in turn reduce the installation force compared to a blunter transition portion. Both the fastener of A7 and the contested patent may therefore be regarded as "minimizing", in the sense of reducing, the installation force. As this feature does not allow a clear distinction to be made between the claimed fastener and the fastener of A7 then this feature must be regarded as being known from A7.

2.2.4 Coefficient of friction

The Board considers that the following feature is known from A7:
the coefficient of friction between the inner surface of the sleeve member and the smooth cylindrical shank portion of the pin member is so chosen as to be less than the coefficient of friction between the outer surface of the sleeve member and the inside diameter surface of the aligned holes through the two or more workpieces in order to reduce the amount of stretch of the sleeve member thereby allowing the smooth

cylindrical shank portion to expand the sleeve member into an interference fit with the two or more workpieces.

The Board is not convinced by the argument that the materials disclosed in A7 would not lead to the claimed coefficients of friction. The coefficient of friction between the pin and the inside diameter of the sleeve is a function of the respective pin and sleeve materials. According to the claim this coefficient of friction should be less than the coefficient of friction between the outer surface of the sleeve member and the inside diameter surface of the aligned holes through the two or more workpieces. However as the workpieces are not part of the claimed subject-matter then the claim can only be regarded as being limited insofar as the coefficient of friction between the pin and the inside diameter of the sleeve should be **suitable for being** less than the coefficient of friction between the outer surface of the sleeve member and the inside diameter surface of the aligned holes through the two or more workpieces. As it would be possible to select a workpiece material where this condition was fulfilled, then this feature must be regarded as being known from A7.

Moreover, the Board is not convinced by the argument that in A7 the materials were not chosen so to provide a coefficient of friction less than the coefficient of friction between the outer surface of the sleeve member and the inside diameter surface of the aligned holes through the two or more workpieces. The reason being that how the coefficient of friction is chosen is not a feature of the fastener itself but of the design process that led to the fastener. Therefore this feature also cannot contribute to the novelty of the

subject-matter of claim 1.

2.2.5 Consequently, the subject-matter of claim 1 of the main request is not new (Articles 54(1) & (2) EPC).

3. Auxiliary request I

3.1 Admissibility

Appellant II filed this request after the Board had issued the communication pursuant to Article 15(1) RPBA and had summoned to oral proceedings.

This request contained two independent claims 1 and 2 together with dependent claims 3-6. Independent claim 1 of this request was substantially the same as independent claim 1 of the third auxiliary request filed on 6 February 2013 and which was replaced in proceedings before the Opposition Division (see paragraph 3.2 of the minutes of the oral proceedings of 6 March 2013). The request filed on 6 February 2013 consisted of a single independent claim and dependent claims 2-7.

The Board admitted this request into the procedure (Article 13(1) and (3) RPBA) because having two independent claims in this request meant that it was a different request to that withdrawn before the Opposition Division. Moreover the independent claims of this request corresponded to those of the third auxiliary request filed with the reply to the statement of grounds filed of appeal filed by Appellant I; the difference with the previous request on file being the deletion of dependent claim 7 which was a reaction to comments made by the Board in the invitation to oral proceedings. Thus this request did not present any

issues which the Board or the other party could not be reasonably be expected to deal with during the oral proceedings. The Board consequently admitted this request into the proceedings.

3.2 Novelty

The novelty of the subject-matter of the independent claims of this request was not disputed.

3.3 Inventive step

It is uncontested that A7 is the most relevant prior art. A7 discloses the features of claim 1 identified above.

The subject-matter of claim 1 therefore differs in that:
the transition portion is a tapered transition portion having an angle less than or equal to 20° from the smooth cylindrical shank portion as the diameter decreases radially from the smooth shank portion to the threaded portion.

The subject-matter of claim 2 differs in that:
the transition portion is a transition portion having a length of between 0.254 mm (0.010 inches) and 0.737 mm (0.0290 inches), the diameter of the transition portion decreasing radially between 0.102 mm (0.004 inches) and 0.127 mm (0.005 inches) as it extends from the smooth cylindrical shank portion to the threaded portion.

The Board considers that the person skilled in the art would recognise that changing the geometry of the transition portion would have an influence on the axial force required to insert the pin into the sleeve, thus

affecting sleeve stretch which is directly related to the axial loading of the sleeve.

The problem to be solved is therefore regarded as being to propose a fastener which is optimized to minimize sleeve stretch during installation.

In seeking to solve the above problem the skilled person would examine the geometry of the transition portion because it is generally known that with a more tapered transition, objects are easier to insert into holes. Moreover as part of his daily work the person skilled in the art would be obliged to select the fastener dimensions. Such daily activities, in particular the optimisation of dimensions, do not involve an inventive step for the skilled person.

For these reasons the subject-matter of independent claims 1 and 2 does not involve an inventive step.

4. Auxiliary Request II

4.1 Admissibility

Appellant II filed this request after the Board had issued the communication pursuant to Article 15(1) RPBA and had summoned to oral proceedings.

Appellant II had modified the request filed with the reply to the statement of grounds filed of appeal filed by Appellant I by deleting a feature which could have been regarded as unclear in the light of comments made by the Board in its communication.

The Board admitted this request because its filing could be seen as a reaction to comments made by the

Board in the invitation to oral proceedings. Moreover, this request did not present any issues which the Board or the other party could not be reasonably be expected to deal with during the oral proceedings.

4.2 Article 123(2) EPC

The Board is not convinced by the argument of appellant I that the feature "low friction coating" was only disclosed in combination with the outer surface having a rougher surface than the inner surface. The Board considers that the basis for the feature of "low friction coating" is to be found in §42 of the description as originally filed. Here the low friction coating is not mentioned in connection with the rougher surface. There is therefore a basis in the application as originally filed for this amendment and consequently the requirements of Article 123(2) EPC are met.

4.3 Article 84 EPC

The Board considers that the term "low friction coating" to be clear in the context of the patent. The skilled person would consider a "low friction coating" to be a layer applied to the sleeve and which provided lower friction than the sleeve material on its own.

Moreover the argument of appellant I that this expression was in contradiction to there being sealant provided is not convincing. The Board agrees that providing a sealant is known from D2 however whether or not a sealant could be regarded as a low friction coating depends on the properties of the sealant. In the specific example of the description [0043] there is a low friction coating and a sealant. However the claim merely requires a low friction coating, it does not

exclude the presence of a sealant but neither does it require it. The Board can see no contradiction in this which would lead to the claim not being clear. Furthermore, although A9 uses the terms "lubricating film" and "coating" apparently interchangeably and A10 uses "lubricant", this does not alter the fact that the person skilled in the art would understand the language of the claim and would be able to determine the extent of protection sought.

Thus the person skilled in the art would know whether a given fastener fell within the scope of the claim and consequently the claims are clear (Article 84 EPC).

4.4 Inventive step

4.4.1 State of the art

The Board considers A17 to be state of the art according to Article 54(2) EPC because its date of printing (i.e. 1992) was several years before the priority date of the contested patent (i.e. 21 September 2006). Moreover as a brochure then it is the sort of document that would be freely distributed to the public.

The Board notes that A16 was last revised in 1985 and A17 was printed several years later. Whilst both documents refer to the same part reference numbers, it cannot be excluded that the fasteners themselves have been changed in the intervening years. Thus A16/A17 cannot be regarded as being a single document. Whilst A17 is the type of document that would be publically available, the same cannot be considered proven of A16. The Board therefore considers A17 to be state of the

art according to Article 54(2) EPC but not however A16.

4.4.2 A7 as closest prior art.

The subject-matter of claim 1 differs from the fastener of A7 in that:
the transition portion is a tapered transition portion having an angle less than or equal to 20 degrees from the smooth cylindrical shank portion as the diameter decreases radially from the smooth shank portion to the threaded portion,
and in that
the inner surface of the sleeve member is coated with a low friction coating to reduce the amount of friction as the smooth cylindrical shank portion of the pin member enters the sleeve member.

4.4.3 A17 as closest prior art

It has not been disputed that the subject-matter of claim 1 differs from the fastener of A17 in that the pin has a threaded portion, the transition portion is a tapered transition portion having an angle less than or equal to 20 degrees from the smooth cylindrical shank portion as the diameter decreases radially from the smooth shank portion to the threaded portion,
and in that the inner surface of the sleeve member is coated with a low friction coating to reduce the amount of friction as the smooth cylindrical shank portion of the pin member enters the sleeve member.

The Board notes that A17 discloses fewer structural features of claim 1 than does A7. It is thus a less promising starting point to arrive at the claimed invention.

The Board did however consider that A15 and A7 showed that the provision of threaded portion on the pin, as claimed, was a well-known alternative to the grooved portion disclosed in A17.

4.4.4 The problem to be solved may therefore be regarded as being to propose a fastener which is optimized to minimize the installation force required for the high interference conditions resulting from installation. This problem may be derived from the patent [0048] where the technical effects associated with the transition portion geometry are explained. These technical effects were also illustrated by the documents submitted by Appellant II during the oral proceedings.

4.4.5 This problem is solved by the particular form of the transition portion in combination with the low friction coating on the inner surface of the sleeve.

4.4.6 A10 relates to a fastener with a split sleeve which is cold worked in place by a mandrel. The interior surface of the sleeve has a solid film lubrication (A10, col.7, l. 48-51). Hole lubrication is moreover costly (A10, col.1, 20-21).

The Board is not persuaded that non-split sleeves were also disclosed in A10 (A10, col. 1, l.45-47) because this disclosure relates to the background prior art discussed in A10. It is not disclosed whether the sleeves of these documents had a low friction coating or not. Therefore A10 can only be read as disclosing a low friction coating in combination with a split sleeve.

Given the above structural differences between the

fastener of A7, or indeed A17, and that of A10, and that A10 is moreover directed to the problem of providing precision sized holes which is not a problem that arises in the fastener of A7, A17 or the contested patent. The use of a mandrel rather than a pin as claimed is also significant because the mandrel is intended to be reused. Thus wear of the mandrel is a problem which would occur with the arrangement of A10 but not with the single use arrangement of A7 or A17. Therefore, the skilled person would not refer to A10 when seeking a solution to the problem posed.

Moreover, even if the provision of a low friction coating were to be considered as simply part of the knowledge of the person skilled in the art, then the claimed solution would also involve an inventive step. The skilled person would know that the provision of lubrication would reduce the installation force required for the pin. The skilled person would then have to further develop this idea by deciding where to place the lubrication and in what form. Given the amount of modifications that would have to be made to the fastener of A7, or indeed A17, and without a specific teaching or suggestion in the prior art then the person skilled in the art would not arrive at the subject-matter of claim 1 without an inventive step being involved.

4.5 Therefore the subject-matter of claim 1 of the second auxiliary request involves an inventive step in the sense of Article 56 EPC.

Order

For these reasons it is decided that:

1. The appeal of the opponent is dismissed.

2. The decision under appeal is set aside.

3. The case is remitted to the Opposition Division with the order to maintain the patent in amended form on the basis of the following documents:

claims:	1 to 5	filed as fourth auxiliary request with letter of 26 August 2014 (new second auxiliary request)
description:	columns 1 to 11	filed during the oral proceedings
figures:	1 to 10	of the patent as granted.

The Registrar: The Chairman:

V. Commare I. Beckedorf

Decision electronically authenticated