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Datasheet for the decision of 3 February 2015

Case Number: T 0858/12 - 3.2.08

Application Number: 01948624.0

Publication Number: 1295046

IPC: F16B19/05

Language of the proceedings: EN

Title of invention:
SWAGE COLLAR WITH INTERNAL SEALING INSERT

Patent Proprietors:
HI-SHEAR CORPORATION
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 Art. 56

Keyword:
Inventive step - (yes)

Decisions cited:

Catchword:

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Case Number: T 0858/12 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 3 February 2015

Appellant I: (Patent Proprietor 1)	HI-SHEAR CORPORATION 2600 Skypark Drive Torrance, CA 90509-2975 (US)
Appellant I: (Patent Proprietor 2)	The Boeing Company 100 North Riverside Plaza Chicago, IL 60606-2016 (US)
Representative:	Boult Wade Tennant Verulam Gardens 70 Gray's Inn Road London WC1X 8BT (GB)
Appellants II: (Opponents 1 to 5)	Airbus Operations GmbH/Airbus Operations SAS (FR)/ Airbus Operations Limited (GB) / Airbus Operations S.L. (ES)/Airbus SAS (FR) Kreetslag 10 21129 Hamburg (DE)
Representative:	Isarpatent Patent- und Rechtsanwälte Friedrichstrasse 31 80801 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 13 February 2012 concerning maintenance of the European Patent No. 1295046 in amended form.**

Composition of the Board:

Chairman	I. Beckedorf
Members:	P. Acton
	M. Alvazzi Delfrate

Summary of Facts and Submissions

I. The duly filed and reasoned appeals of appellants I (patent proprietors 1 and 2) and appellants II (opponents 1 to 5) are directed against the interlocutory decision of the opposition division posted on 13 February 2012 maintaining European patent No. EP 1 295 046 in amended form.

II. Oral proceedings took place before the board of appeal on 3 February 2015.

Appellants I requested that the decision under appeal be set aside, that the patent be maintained in amended form on the basis of the set of claims filed as (new) main request with letter of 12 December 2014 and that the appeal of appellants II be dismissed.

Appellants II requested that the decision under appeal be set aside, that European patent No. 1295046 be revoked and that the appeal of appellants I be dismissed.

III. The following documents were used in the present proceedings:

E1: DE-A-28 55 712,
E3: US-A-3 550 498,
E7: US-A-5 454 675
E9: Fastener Design Manual, NASA Reference Publication 1228, March 1990, p. 26 - 34
E13: US-A-4 867 625
E16: Handbook of Bolts and Bolted Joints, J. H. Bickford, S. Nassar, Marcel Dekker, Inc., page 3

IV. Claim 1 according to the main request reads:

"A swage collar apparatus for sealing a connection of a fastener (7) through a composite assembly of workpieces (11) together and for preventing leakage through the connection, the fastener (7) including a shaft (8) having an externally threaded or grooved section (10), the swage collar apparatus comprising a hollow, generally cylindrical swage collar (3) adapted to be disposed over the shaft (8) of the fastener (7), the swage collar (3) having a main body portion (1) with a main central bore (2), and a base portion (4) with an internal shoulder (6) formed in the main central bore so as to form a seal receiving guide, the internal shoulder (6) having a diameter that is larger than the diameter of the main central bore, and an internal sealing material (5) disposed in the swage collar (3) over the fastener (7),

characterized in that:

the internal sealing material comprises an internal sealing insert (5, 85) having a surface defining an annular rounded exterior flange (87) (Feature 8),

and the internal shoulder (6, 86) of the main central bore (2, 82) of the swage collar (3, 83) has a surface defining a corresponding rounded channel or groove (89) (Feature 9)

into which the annular rounded exterior flange (87) interfits, to thereby lock the internal sealing insert (5, 85) into place within the internal shoulder (6, 86) of the main central bore (2, 82) (Feature 10)."

The references to features 8 to 10 were introduced by the board.

V. The arguments of appellants II may be summarised as follows:

The subject-matter of the preamble of claim 1 differed from the apparatus disclosed in E1 only in that it referred to a swage collar instead of a nut.

E1 also disclosed a nut with a shoulder with a main central bore, having an internal shoulder defining a rounded channel or groove, as shown in Figure 7. This groove **corresponded** with the seal insert, which formed an "annular rounded exterior flange" when inserted into the internal shoulder of the central bore as described at the top of page 6 and shown in Figure 5 (Feature 9). Since page 6, lines 6 and 7 indicated that the sealing insert lay against ("anliegt") the shoulder 40, E1 disclosed further that the sealing insert had a "**rounded exterior flange**" as required by Feature 8. In this context it had to be stressed that the characterising portion of claim 1 did not imply that the sealing insert had a rounded exterior flange in its uninstalled condition, nor did the patent in suit in any of its parts explicitly describe this specific geometry.

Moreover, E1 indicated on line 7 of page 6 that the sealing insert was held in place by the lip 32 in a friction fit ("Reibungssitz"), hence disclosing explicitly that the rounded groove in the central bore's shoulder and the sealing insert corresponded to each other and that they **interfitted** (Feature 10).

Therefore, since E1 disclosed the whole characterising part of claim 1, the subject-matter of claim 1 differed from the apparatus disclosed in E1 only in that it referred to a swage collar apparatus instead of to a nut.

Since E3 disclosed a swage collar apparatus, it followed that, irrespective of whether the skilled person started from E1 or E3 as representing the closest prior art, he would arrive at the subject-matter of claim 1 in an obvious way. Hence the subject-matter of claim 1 did not involve an inventive step.

VI. The arguments of appellants I may be summarised as follows:

The sealing insert of E1 had a generally annular shape (see page 5, last two lines) and took the shape of a rounded flange only when pressed into the recess of the nut's wall when the latter was screwed onto the bolt. On the contrary, it was clear from Feature 8 of claim 1 that the claimed "rounded exterior flange" was an inherent attribute of the sealing which was present before its insertion into the annular collar of the main central bore of the swage collar. This intrinsic characteristic was stressed further by the wording of the subsequent two features, which required that the main central bore had a surface defining a "corresponding rounded channel or groove into which the annular rounded exterior flange interfits, to thereby lock the internal sealing insert". Hence, the sealing insert of E1 did not have an "**annular rounded exterior flange**" which existed independently of the internal nut's shape, as required by Feature 8.

The shoulder of the central bore of the nut according to E1 had a recess which could indeed be considered to represent a rounded channel or groove. However, this form was not conceived in order to **correspond** specifically with the sealing insert's geometry, since – as stated above – the sealing insert of E1 did have a generally cylindrical shape with an exterior flange. Hence E1 did not disclose Feature 9 either.

Since the sealing insert did not have an annular rounded exterior flange, it could not interfit with and be locked within the internal shoulder of the main central bore as required by Feature 10.

Hence the subject-matter of claim 1 differed from the apparatus according to E1 not only in that it defined a swage collar apparatus instead of a nut, but also in all features of the characterising portion.

E3 referred to a swage collar apparatus, but undisputedly did not disclose or suggest any of the features of the characterising portion of claim 1.

Therefore, irrespective of whether E1 or E3 were considered to represent the closest prior art, even if the skilled person combined the teaching of E1 with that of E3 he would not arrive at the subject-matter of claim 1 according to the main request.

Reasons for the Decision

1. The appeals are admissible.

2. Inventive step

2.1 Documents E7, E9, E17 and E16 have been used in the appeal proceedings for the purpose of showing the different principles underlying the nut-bolt and the swage-collar fastening principles, to argue whether the same principles could be applied to either fastening system, and to assess whether E1 or E3 should be considered as representing the closest prior art. Since, in view of the following considerations, it is irrelevant for the outcome of this case to determine conclusively whether E1 or E3 represents the closest prior art for the claimed subject-matter, these documents are not further discussed in the present decision.

2.2 E1 undisputedly discloses a

nut for a nut-bolt apparatus for sealing a connection of a fastener through a composite assembly of workpieces together and for preventing leakage through the connection (see page 3, second paragraph), the fastener including a shaft having an externally threaded or grooved section, the apparatus comprising a hollow, generally cylindrical nut (10) adapted to be disposed over the shaft of the fastener, the nut (10) having a main body portion with a main central bore (22), and a base portion (12) with an internal shoulder (40) formed in the main central bore so as to form a seal receiving guide, the internal shoulder (40) having a diameter that is larger than the diameter of the main

central bore, and an internal sealing material (34) disposed in the nut over the fastener.

2.3 It is disputed whether E1 discloses the characterising portion of claim 1 as well.

2.3.1 In this context appellants II dispute that either the combination of Features 8 to 10 or the rest of the patent in suit discloses or suggests that the sealing insert has to show an "annular rounded exterior flange" when it is not fitted in the swage collar, i.e. as an intrinsic property. They further argue that the wording of Feature 9 in combination with Feature 10 requires only that the sealing insert and the shoulder of the main central bore correspond to each other when assembled together in order to be able to interfit and lock the sealing insert. Exactly this relation between the sealing insert and the nut was shown in Figure 5 and described in the first paragraph of page 6 of E1.

2.3.2 It is true that E1 shows in Figure 7 an internal shoulder of the nut's main central bore with a shape which could be considered to represent "a rounded channel or groove". This geometrical aspect of the nut, however, does not cover the whole of Feature 9. The claimed feature requires namely that this channel or groove corresponds to the annular rounded exterior flange of the sealing insert.

E1 clearly describes in the paragraph bridging pages 5 and 6 that the sealing insert is defined as a sealing ring ("Dichtungsring") made in a generally annular shape with an external diameter which is essentially the same as that of the internal shoulder of the main bore. Nowhere does this passage indicate or suggest that an "annular rounded exterior flange" is present on

the external surface of the sealing ring of E1 as required by Feature 8.

As pointed out by appellants I, this paragraph further indicates that the sealing ring is inserted under friction in the larger opening of the bore in such a way that it lies against the shoulder 40 and is held in place by the lip 32. The described interaction between sealing ring and internal bore might indeed cover the requirement of Feature 10 for the annular rounded exterior flange to lock the internal sealing insert into place within the internal shoulder. However, E1 does not indicate that the insert's flange and the shoulder's groove interfit, i.e. that they are of such size and shape as to fill exactly a given space, or conform properly to the contour of their counterpart.

Hence, E1 does not disclose the features of the characterising portion of claim 1.

2.4 It has not been argued that the features of the characterising portion are suggested by E3 or by any prior art used in the appeal proceedings, or that these features are obvious in the light of the common technical knowledge and practice of the person skilled in the art.

Indeed, neither E1 nor E3 suggests modifying the nut in relation to the swage collar apparatus in order to attain the claimed geometry. Finally, even taking into account the prior art used during the appeal proceedings, it is not obvious to modify the internal geometry of the nut-bolt apparatus according to E1 or of the swage-collar apparatus according to E3 in such a way as to provide the sealing insert with an annular rounded external flange, as required by claim 1.

2.5 Therefore, irrespective of whether the skilled person starts from E1 or from E3 as the closest prior art, the combination of all features of E1 and E3 does not add up to all features of claim 1, and the subject-matter of claim 1 involves an inventive step.

Order

For these reasons it is decided that:

1. The appeal of appellants II (opponents 1 to 5) 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 12
   filed with letter of 12 December 2014 as (new) main request
   description page 2a (comprising two sheets)
   filed with letter of 12 December 2014 as "Version 1 - Main Request and Auxiliary Request 1 to 4"
   pages 3 to 5
   of the patent as granted
   figures all
   of the patent as granted.

The Registrar: The Chairman:

V. Commare I. Beckedorf

Decision electronically authenticated