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D E C I S I O N
of 17 March 1994

Case Number: T 0863/90 - 3.2.5

Application Number: 83113048.9

Publication Number: 0112566

IPC: B21K 1/74

Language of the proceedings: EN

Title of invention:
Process for manufacturing universal joint

Patentee:
Aida Engineering Ltd.

Opponent:
NACAM S.A.

Headword:

Relevant legal norms:
EPC Art. 54, 56

Keyword:
"Novelty (yes)"
"Inventive step (yes, after amendment)"

Decisions cited:

Catchword:

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0863/90 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 17 March 1994

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office dated 11 September 1990 revoking European patent No. 0 112 566 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: C. V. Payraudeau
Members: H. P. Ostertag
M. H. M. Liscourt

Summary of Facts and Submissions

I. An opposition was filed against the European patent No. EP-B-0 112 566 (application no. 83 113 048.9).

II. The Opposition Division revoked the patent by decision dated 11 September 1990, considering that neither the new amended Claim 1 according to the main request nor Claim 1 according respectively to the auxiliary request A and to the auxiliary request B satisfied the requirements of Articles 52 and 56 EPC.

III. The Appellants (Patentees) appealed against this decision on the 8 November 1990, requesting the revocation of the impugned decision and the maintenance of the patent on the basis of the above mentioned main or auxiliary requests. A cheque covering the fee for appeal was enclosed with the letter of appeal. The statement setting out the grounds of appeal was filed on the 10 January 1991.

V. Among the numerous documents cited during the opposition proceedings, only the following ones were considered as relevant in the appeal proceedings:

(a) R-A-2 458 002
(b) FR-A-2 448 068
(c) FR-B-1 515 051
(c1) FR-B-94 333
(d) FR-A-2 441 759
(e) FR-A-2 446 958
(f) Techniques de l'ingénieur métallurgie "travail des métaux en feuilles"
(g) FR-A-2 525 129
(h) FR-A-2 525 130

VI. At the oral proceedings before the Board of Appeal, the Appellants requested the maintenance of the patent in amended form on the basis of a single claim filed during the oral proceedings.

VII. Said single claim reads as follows:

" A process for manufacturing a universal joint, comprising of:

- a punching step to punch a blank (6) out of a sheet metal material, said blank being integrated with one contiguous sheet metal from a hub member portion (2), lug member portions (7,12) on opposite ends of the hub member portion (2) and a pair of fork member portions (4) projecting at right angles from one of the side edges of the said hub member portion (2);

- an extruding step to squeeze each opposite edge of the lug member portions (7,12) to form projections (9) at the same time as squeezing bottom cavities (8) for bolt holes thereon with said projections (9) having a length corresponding substantially to that of the bottom cavities (8);

- a bending step to bend each root portion of the fork member portion (4) so as to provide a necessary difference of height between the hub member portion (2) and the fork member portions (4);

- a forming step to form the said hub member portion (2) to a cylindrical shape;

- a bending step to form both of the hub and lug member portions to project said lug member portions (7) in parallel to each other from said hub member portion (2), with said projections (9) being of said lug

member portions (7,12) being arranged in opposed relationship to each other at a certain interval between the lug member portions, said interval being dimensioned to form marginal space for bolting the lug member portions (7) and

- a boring step to form bolt holes (14) on the lug members (12) by using the said bottom cavities (8) as guide means, thus removing the center portions of said projections (9) but leaving their side portions in order to stabilize the position of the lug portions when being bolted."

VIII. In support of their request, the appellants pointed out the fact that the underlying problem of the invention is not limited to improving the structural strength of the lug portions and to reduce the amount of material and that an important additional purpose of the invention is to improve the stability of the bolting.

According to the Appellants, the specification gives information concerning the way the latter problem is solved, namely by dimensioning the length of the projections in such a way that the total length of the bolt to be inserted in the holes of the lug portions is surrounded and guided by the structure of the lug portions of said projections, ensuring a stable position of the bolt and enabling an exact attachment to the rotary driving shaft.

IX. The Respondents requested that the appeal be rejected and submitted in support of their request essentially the following points:

- the claim is not clear because it contains expressions which are undetermined, like "certain distance" or "marginal space" which cannot be used to

define the corresponding parts of a joint and which cannot be used further to characterise a process for making the same. The word extruding is not adapted for the method step consisting in changing the form of the lugs in a certain manner;

- the claimed invention is a process while most of the arguments which are given in favour of inventiveness are directed to the product which is obtained by it;

- the succession of method steps is nothing but what is usually performed in a factory specialised in forming pieces out of a flat metal blank.

- there is no relation between the process which is claimed and the product which is obtained and there is no process feature which could lead to particular features for the product obtained directly by said process;

- the method steps through which the claimed process differs from the state of the art are only features characterising the universal joint which is manufactured and are not such that they could let appear an inventive step in the subject-matter of the claim.

X. During the oral proceedings, the Respondents raised the objection that the claim should have been drafted in the two-part form according to Rule 29(b) EPC. It was observed by the Board that in the present case, the two-part form would be inappropriate to draft a claim for the process according to the invention.

Reasons for the Decision

1. *Admissibility of the appeal*

1.1 The admissibility of the appeal has been put in doubt by the Respondents without any substantiation of said doubts except the fact that he has not been made aware of how and when the appeal fee has been paid.

1.2 As indicated above, the appeal fee has been paid with a cheque attached to the notice of appeal received on 8 November 1990. Said cheque has been paid.

1.3 The Board has further checked of its own motion the admissibility of the appeal and has come to the conclusion that the appeal is admissible, the conditions of Article 106 to 108 and of Rule 64 being fulfilled.

2. *Allowability of the new claim under Article 100(c) EPC*

2.1 The present claim is based on the granted Claim 1 in which features taken from the description and represented on the drawings have been introduced, namely:

- the feature now claimed that the projections have a length corresponding substantially to that of the bottom cavities is disclosed in column 2, lines 53-56 of the granted patent;

- the feature that the projections (9) of said lug member portions (7,12) are arranged in opposed relationship to each other at a certain interval between the lug member portions, said interval being dimensioned to form marginal space for bolting the

lug member portions is disclosed in column 3, lines 35-38 of the patent; and

- the feature that a boring step is used to form bolt holes (14) on the lug members (12) by using the said bottom cavities (8) as guide means, thus removing the centre portions of said projections (9) but leaving their side portions in order to stabilize the position of the lug portions when being bolted is disclosed in Claim 2 and in column 3, lines 44-55 of the granted patent.

2.2 The Board is therefore of the opinion that the claim satisfies the requirements of Article 100(c) EPC.

3. *Novelty*

3.1 The document representing the state of the art which is the nearest to the claimed process is document (a) which describes an universal joint and gives indications about its manufacturing steps.

3.2 It is already known from this document (a), which belongs to the same technical field as the invention, to produce universal joints starting from a blank punched out of sheet metal material and forming a hub member portion and lug member portions on the opposite ends of the hub member portion and a pair of fork member portions projecting at right angles from one of the side edges of the hub member portions.

3.3 According to this document the lug member portions (13) are submitted to an extruding step in the region around the bolt holes in order to form a boss around said hole, the boss being directed towards the direction opposite to the other lug member.

3.4 The method which is subject matter of the present claim differs from this state of the art inter alia in that:

- the projections are formed at the same time as the bottom cavities are squeezed,

- the projections are formed in opposed relationship to each other in the final product,

- the centre portions of the projections are removed leaving their side portions to stabilize the position of the lug portions when being bolted.

3.5 The other cited documents have much less feature in common with the claimed process.

3.6 The claimed process is therefore novel and this fact has not been challenged by the Respondents.

4. *Inventive step*

4.1 In the conventional universal joints referred to in the patent, produced out of a blank of sheet metal, the lug portions were bent in order to allow boring of the bolts holes and secure the bolting (see Fig. 2(b) of the patent).

4.2 According to document (a), the step of bending the lug portions which presents the drawback of needing more material and of necessitating a supplemental bending step is avoided by extruding around the bolt hole in each lug portions a boss extending above the outside surface of the lug portion. The purpose of said measure is to increase the resistance of the lug member portions to the efforts to which they are submitted when

tightening the bolts, and to obtain a better support for the screw and bolt when fitted together on the lug portions.

4.3 The problem of the stability of the bolting is however not completely solved with this prior art process since the length of the guiding portion of the bolt holes remains small and the bolts are not guided between the internal faces of the lugs.

4.4 According to the invention, this problem is solved by the given steps which allow obtaining a universal joint which can be manufactured with less material and with less manufacturing steps and which however insures a perfect guiding of the bolts in the lug portions.

4.5 The solution proposed by the invention is neither disclosed nor suggested by the document (a) since this document proposes to reinforce the bolt holes with bosses extending outside of the lug portions, i.e. in the other direction as the invention. Moreover, the document (a) does not give any precise indication as concerns the manufacturing steps of the universal joint and cannot therefore be considered as suggesting the claimed step of forming the projections at the same time as the bottom cavities are squeezed which spare one manufacturing step.

4.6 The other cited documents are further away from the invention as is document (a) and do not disclose a process comprising all the features of the Claim but only show that some individual features of the claim are known per se. The Respondents have not submitted that their teachings could be combined in any way with the teaching of document (a) in order to arrive at the process of the claim and the Board does not also see any possibility for such combination.

4.7 The process which is the subject-matter of claim is therefore seen as involving an inventive step.

5. Since the description has been amended in order to cite the document (a) and to refer to the new amended claim, the patent as amended complies with the other requirements of the EPC and can be maintained on this basis.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent on the basis of the description and claim filed by the Appellant during the oral proceedings and the drawings of the patent as granted.

The Registrar: The Chairman:

A. Townend C. Payraudeau