BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS | BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE | CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 162/91 - 3.2.1

Application No.: 84 900 651.5

Publication No.: 0 134 231

Title of invention: Fixing element for knocking into a drilled hole

Classification: F16B 13/14

D E C I S I O N
of 25 August 1992

Proprietor of the patent: Telefonaktiebolaget LM Ericsson

Opponent: J.H. de Wit en Zonen B.V.

Headword:

EPC Art. 54, Art. 56

Keyword: "Novelty (yes)"
"Inventive step (yes)"

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 162/91 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 25 August 1992

Appellant : (Proprietor of the patent)	Telefonaktiebolaget L.M. Ericsson S-12625 Stockholm (SE)
Representative :	Baumbach, Thorkild et al Ankarvägen 4 S-761 40 Norrtälje (SE)
Respondent : (Opponent)	J.H. de Wit en Zonen B.V. Kanaaldyk Z.0.90 NL-5705 BE Helmond (NL)
Representative :	Müller, Gerd Patentanwälte Hemmerich-Müller-Grosse-Pollmeier-Mey-Valentin Hammerstrasse 2 W-5900 Siegen 1 (DE)
Decision under appeal :	Decision of Opposition Division of the European Patent Office dated 27 December 1990 revoking European patent No. 0 134 231 pursuant to Article 102(1) EPC.

Composition of the Board :

Chairman : F. Gumbel
Members : P. Alting van Geusau
J. de Preter

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 134 231, based on patent application No. 84 900 651.5, which was filed on 25 January 1984 as the international application PCT/SE84/00023, was published on 11 January 1989.

II. The Respondent (Opponent) filed on opposition an 6 October 1989 requesting the revocation of the patent for reasons of lack of novelty and inventive step of its subject-matter with regard to the disclosure of US-A-1 499 071 (D1).

III. By the decision of 27 December 1990 the Opposition Division revoked the patent. The Opposition Division held that when disregarding the non-distinctive characteristics of the particular intended use such as the features following "for knocking" ... "for fastening" ... and also the features following the expressions "preferably" which must be considered entirely optional, the subject-matter of the claim lacked novelty when compared to a fixing element known from D1, in particular the element according to Fig. 9 to 12.

IV. An appeal was lodged against this decision on 19 February 1991 and the appeal fee was paid on 20 February 1991. The Statement of Grounds of appeal was filed on 6 May 1991.

V. In a communication issued together with the summons to oral proceedings as auxiliarily requested by the Appellant, the Board expressed its provisional opinion according to which in D1, even taking into account that the disclosure of D1 is not restricted to the use of screws as expansion members, only expansion members comprising a screw thread on their shaft are disclosed. Further, considering the plug materials referred to in

this document and the screw and plug arrangement of figure 11, which was considered particularly relevant in the opposition procedure, a "knocking" into place of this known fixing element - which functional statement in accordance with EPO practice restricts the scope of the claim to fixing elements which are suitable for the defined manner of use - did not appear to be considered practicable by the skilled person.

Therefore the subject-matter of the claim as granted was considered to be novel with regard to D1.

A more suitable prior art as a starting point for the determination whether the subject-matter of the claim involves an inventive step appeared to be disclosed in DE-A-2 607 338 (D3) cited by the Respondent in the appeal proceedings. This document would disclose a fixing element comprising the precharacterising features of the claim of the contested patent except for the feature that the hole is provided with four internal longitudinal ridges.

VI. At the oral proceedings the Appellant filed a new claim and amended columns 1 to 3 of the description. He requested that the decision under appeal be set aside and that the patent be maintained on the basis of these documents together with the drawings as granted.

The current claim reads as follows:

"Fixing element for knocking into a pre-drilled hole in concrete or the like material in so-called straight-through fixing for fastening wall panels, studs etc., said fixing element consisting of a plug (1) with a nail (2) or the like expansion means coacting therewith, said plug preferably being manufactured in a rigid plastic material and including an expandable portion (3) extending from the

inner end (4) of the plug in a fixed condition and preferably provided with a diametral slit (8), said portion (3) merging into a non-expandable zone (5) terminating at the outer end of the plug in a collar (6), the plug being formed with a central hole (7) starting from the end provided with the collar (6), the hole being adapted to the nail (2) and preferably tapering conically towards the inner end of the plug (4) in the expandable portion (3), characterised in that the inner surface of said hole in the expandable portion (3) is provided with four internal longitudinal ridges (9), the exterior surface of the expandable portion being provided with a plurality of longitudinal grooves (10) which together with the ridges (9) are formed such that the expandable portion has a substantially constant cross-sectional area along the greater portion of its length and the sum of the cross-sectional areas of the expandable portion (3) and the steel nail (2) being substantially equal to the cross-sectional area of the pre-drilled hole of nominal diameter."

VII. In support of his request the Appellant essentially submitted the following arguments.

It is agreed that D3 discloses the nearest prior art and relates to a fixing element comprising the precharacterising features of the claim.

In this known arrangement it has been attempted to achieve sufficient resistance to withdrawal by supplying the expandable portion of the plug with a large amount of material and by forming cut-outs at right angles to the longitudinal axis on the exterior surface of the expandable portion. However, fastening elements of the type plug + screw are still preferred because of their higher withdrawal resistance.

By applying the combination of characterising features of the claim it is possible to achieve values for withdrawal which correspond to those achieved with a plug + screw fastening of high quality.

Although the fixing element disclosed in D1 shows some features of the claim it does not disclose means for or give a hint to the idea of the filling factor being close to 1 which is an essential factor when withdrawal force is concerned. Even when considering Fig. 11 of D1, it is clear that the slits are not filled up and thus no annular appearance - as is referred to in the description of the patent in column 3, lines 26 to 32 - will be achieved when the plug is placed in the hole and the nail is driven in. Moreover, D1 must be considered as incompatible with a fixing element in accordance with the precharacterising portion of the claim mainly because D1 relates to bolt anchors which are conceived to permit a particular sized bolt anchor to be used with the greatest possible range of screws which has nothing to do with the problem of increasing withdrawal resistance for fixing elements of the knocking-in type.

Since no incentive can be derived from D1 to adopt the fixing element disclosed in D3 to include the characterising features of the claim, its subject-matter must be considered to involve an inventive step.

VIII. The Respondent requested that the appeal be dismissed. The counterarguments can be summarised as follows:

Novelty of the subject-matter of the claim is no longer disputed but no inventive activity is involved for arriving at the claimed fixing element when taking into account the prior art disclosed in D3 and D1.

As agreed by the Appellant, all the features mentioned in the precharacterising portion of the claim are known from D3.

Considering D1 it can be derived from Fig. 5 and 6 and the description on page 2, lines 16 to 28 that the longitudinally extending ribs 4 are progressively decreasing in height from the outer end 5 to the inner end 6 of the bolt anchor. Longitudinally extending valleys 8 of increasing depth are arranged parallel to the ribs 4 and are in substantial radial alignment with them.

Since, further, according to the description on page 2, lines 82-105 and in view of Fig. 11, the screwing in of a large screw will exert expansion so that the exterior voids formed by the valleys will be filled up and practically eliminated, the skilled person will arrive at the conclusion that the element must have a substantially constant cross-sectional area along its length and in the expanded state fills up the hole almost completely. This is essentially what is defined in the characterising portion of the claim under discussion.

When looking for a solution to the underlying problem of the patent the skilled person will certainly be led to apply the teaching of D1 because this document, in particular when having regard to Fig. 11 and the text on page 2, lines 90-108, concerns the expansion of the fixing element and it is generally known that the higher the expansion, the better the resistance against withdrawal will be.

It is true that in Fig. 11 the slits 11 are not fully filled up with material but this effect cannot unambiguously be derived from the contested patent and, therefore, cannot be taken into account.

Therefore the skilled person would arrive in an obvious manner at the subject-matter of the claim when applying the teachings of the prior art disclosed in D3 and D1 and for this reason the subject-matter of the claim does not relate to a patentable invention.

Reasons for the Decision

1. The appeal is admissible.

2. Amendments

2.1 The current claim essentially corresponds to the granted Claim 1 but is now related in its precharacterising portion to the closest prior art as disclosed in D3. It further contains a clarification as regards the position of the internal ridges on the inner surface of the hole and is restricted to a filling factor close to 1 by deletion of the alternative "or fall to a minor extent below" on lines 11 and 12 of the granted claim.

These amendments do not contravene Art. 123(2) and (3) EPC.

3. Prior art

3.1 The prior art as disclosed in D3 shows a fixing element for knocking into a pre-drilled hole comprising a combination of a plug and a nail according to the features of the precharacterising portion of the current claim of the patent in suit including the optional features. Although his document was cited for the first time in the appeal procedure, the Board allows its introduction into the procedure in accordance with Art. 114(1) EPC because it represents the closest prior art.

This known fixing element comprises a slotted plug with cut-outs at right angles to the longitudinal axis on the exterior surface of the expandable portion to form claw-like engagement means which will grip into the wall of the hole.

3.2 The further document cited, D1, discloses a ductile bolt anchor which is of particular configuration so that it will permit a particular sized bolt anchor to be used with the greatest possible range of screws or other expanding means of different sizes or diameters (page 1, lines 10-15). The bolt anchor is in fact a plug formed of any suitable material such as lead or an alloy, is provided with a collar, has a uniform outer circumference 2 and an inclined bore 3 with longitudinally extending ribs 4 of progressively decreasing height from the outer end 5 to the inner end 6 of the bolt anchor. These interior longitudinally extending ribs form interior longitudinally extending voids 7.

The outer surface comprises longitudinally extending valleys 8 with progressively increasing depth from the outer end to the inner end of the bolt anchor. These longitudinally extending valleys form exterior voids which are arranged parallel and in radial alignment with the interior longitudinally extending ribs 4 (see page 2, lines 11 to 38).

In Fig. 11 the bolt anchor is shown with the largest size screw which can be used with that anchor.

This large screw exerts such an expansion that the internal and external voids are filled up and are practically eliminated (see page 2, lines 90-105).

Although D1 does not explicitly disclose that the plug has a constant cross-sectional area along its length the Board follows the Respondent's view that, considering the progressively decreasing height of the ribs 4 and the valleys 8 of progressively increasing depth together with the condition of page 2, lines 100-105 that the metal of the ribs will be readily forced radially and fill up the voids formed by said valleys, this can only be achieved when the plug has a substantially constant cross-sectional area along its length and that this feature is thus implicitly known from D1.

However, the Board cannot follow the Respondent's view that the sum of the cross-sectional areas of the expanded portion and the screw is substantially equal to the cross-sectional area of the pre-drilled hole of nominal diameter since clearly in Fig. 11 of D1 the slots 11, permitting a more ready expansion of the bolt anchor (see page 2, lines 39-41), are not filled up.

4. Novelty

4.1 As follows from the above analysis of the available prior art, neither D1 nor D3 discloses the combination of features of the claim under discussion and therefore its subject-matter must be considered novel within the meaning of Art. 54 EPC.

5. Inventive step

5.1 Fastening elements intended for knocking in of the type described in D3 have the drawback that their resistance to withdrawal is less than that of a plug + screw arrangement.

The object of the patent in suit is to provide a fastening element with the aid of which it is possible to achieve values for withdrawal resistance which correspond to those achieved with a plug + screw fastening of high quality, (see also column 1, lines 35 to 40 of the patent specification). This object is achieved with the combination of features of the claim which make clear that the plug and nail are adapted to each other so that when the plug and the nail are knocked into the wall the area of the fixing assembly is substantially equal to the cross-sectional hole area which means that the filling factor is as close as possible to 1.

5.2 Although D1 discloses some of the features of the claim this document cannot, in the Board's opinion, be considered pertinent for the following reasons.

Firstly, D1 deals with a fully different problem to be solved, i.e. the provision of a bolt anchor (plug) which is conceived so that it can be used with the greatest possible range of screws. Having regard to this difference concerning the problems to be solved, it is questionable whether the skilled person would have considered this prior art when searching for a solution to the underlying problem of the patent.

Certainly, when using the largest possible screw for a given plug (see Fig. 11 of D1) an expansion of the known plug is achieved by which plug material will be forced radially and the voids are filled up in a manner similar to that referred to in the patent in suit. However, this example only illustrates the functioning of the plug for one particular screw size and when seen in the context of the disclosure of D1 cannot be considered to give a teaching that this example would be particularly advantageous when looking for a solution to the problem of

achieving high withdrawal resistance. Moreover the filling factor of this example cannot be considered as being close to 1 since the slots 11 are not filled up and no teaching whatsoever can be derived that further expansion should take place to improve withdrawal resistance.

In this respect the Respondent argued that the plug disclosed in the patent in suit may also have slots and that it is not said in the patent specification that these slots are also filled up. This argument is not considered convincing in view of the fact that the patent under discussion explicitly deals with the filling factor being close to 1 with a view of improving the resistance to withdrawal of a plug + nail combination thus leading to the conclusion that when a slot is used such a slot must be filled up in order to meet the condition of the claim. That such is the case is also clearly derivable from column 3, lines 26 to 32 of the patent.

5.3 Thus considering the cited prior art the Board comes to the conclusion that even when combining the teachings of D3 and D1, this would not provide the skilled person with sufficient further information so that he would arrive in an obvious manner at the claimed subject-matter. As a consequence, the subject-matter of the claim is to be considered to involve an inventive step (Art. 56 EPC).

5.4 Summarising, in the Board's judgment, the proposed solution to the technical problems underlying the patent in suit defined in the single claim is patentable and therefore this claim can form the basis for maintenance of the patent (Article 52(1) EPC).

6. The description and drawings are in agreement with the actual wording and scope of the claim and are also suitable for maintenance of the patent in the amended form.

Thus, taking into consideration the amendments made by the Appellant, the patent and the invention to which it relates meet the requirements of the EPC and the patent as amended may be maintained in this form (Article 102(3) EPC).

Order

For these reasons, it is decided that:

1. The contested decision is set aside.

2. The case is remitted to the first instance with the order to maintain the patent with the documents presented at the oral proceedings of 25 August 1992 and the drawings as granted (see point VI of this decision).

The Registrar: The Chairman:

S. Fabiani F. Gumbel