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**Datasheet for the decision
of 10 January 2025**

Case Number: T 1711/22 - 3.2.04

Application Number: 16809208.8

Publication Number: 3362623

IPC: E05D3/16, E05D7/04, E05D9/00

Language of the proceedings: EN

Title of invention:
INVISIBLE CONCEALED HINGE FOR DOORS

Patent Proprietor:
Kuantica S.r.l.

Opponents:
ANSELMINI & C. S.R.L.
Simonswerk GmbH

Headword:

Relevant legal provisions:
EPC Art. 123(2), 54, 56

Keyword:

Amendments - allowable (yes)

Novelty - main request (yes)

Inventive step - main request (yes)

Decisions cited:

Catchword:



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Case Number: T 1711/22 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 10 January 2025

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
6 May 2022 concerning maintenance of the
European Patent No. 3362623 in amended form.**

Composition of the Board:

Chairman A. Pieracci
Members: J. Wright
 C. Heath

Summary of Facts and Submissions

- I. The appeals were filed by the proprietor and opponent 2 against the interlocutory decision of the opposition division finding that, on the basis of the auxiliary request 1, the patent in suit met the requirements of the EPC.
- II. The opposition division decided that the subject matter of the main request extended beyond the content of the application as filed.
- III. In preparation for oral proceedings before the Board, the Board issued a communication on 13 June 2024, setting out its provisional opinion on the relevant matters. Oral proceedings were held on 10 January 2025 in the absence of the party as of right, opponent 1, which had been duly summoned.
- IV. The appellant-proprietor requests that the decision under appeal be set aside and that the patent be maintained in amended form according to the main request or in the alternative according to one of auxiliary requests 1 to 19, all refiled with the grounds of appeal.

The appellant-opponent 2 requests that the decision under appeal be set aside and that the patent be revoked.

The opponent 1 made neither submissions nor requests in appeal.

V. The independent claim of the main request reads as follows:

"Invisible concealed hinge (1) for doors comprising:
- a first connecting body (2a) intended to be inserted within a respective housing cavity formed in the jamb or in the leaf of the door, the first connecting body (2a) extending: in depth along a first direction (X1) in the space which coincides with the direction of insertion in the respective housing cavity in the jamb or in the leaf; in width along a second direction (Y1) in the space perpendicular to the first direction (X1); in length along a third direction (Z1) in the space perpendicular to both the first (X1) and the second (Y1) directions;
- a second connecting body (2b) intended to be inserted inside a respective housing cavity formed in the jamb or in the leaf of the door, the second connecting body (2b) extending: in depth along a fourth direction (X2) in the space which coincides with the direction of insertion in the respective housing cavity in the jamb or in the leaf; in width along a fifth direction (Y2) in the space perpendicular to the fourth direction (X2); in length along a sixth direction (Z2) in the space perpendicular to both the fourth (X2) and the fifth (Y2) directions;
- an articulation device (3) that interconnects the first (2a) and the second (2b) connecting bodies allowing their relative movement between a closed condition, corresponding to the closing of the door, and a condition of complete opening, corresponding to the complete opening of the door;
in the closed condition the first (2a) and the second (2b) connecting bodies defining, in combination between each other, a seat in which is enclosed the articulation device (3), the first (2a) and/or the

second (2b) connecting body comprising a supporting structure (4a, 4b), which in turn comprises:

- a central part (40a, 40b) intended to accommodate part of the articulation device (3);
 - two end portions (41a, 41b), placed on opposite sides of the central part (40a, 40b) along the length direction (Z1, Z2) of the respective connecting body (2a, 2b) and intended to interact with and/or accommodate fixing means of the connecting body (2a, 2b) to the jamb or the leaf;
 - the first (2a) and the second (2b) connecting bodies having two sides (21a, 22a; 21b, 22b) opposite with respect to a plane defined by the depth direction (X1, X2) and by the length direction (Z1, Z2), of said two sides (21a, 22a; 21b, 22b) the inner one (21a, 21b) being the side that in the opening-closing movement of the hinge (1) runs the shorter trajectory path, the outer one being the other (22a, 22b);
- characterized in that: the supporting structure (4a, 4b) is shaped from a single metallic sheet in a single concave piece having concavity facing in a direction opposite to the depth direction (X1, X2) of the connecting body (2a, 2b) and defined by a bottom (42a, 42b) of the supporting structure (4a, 4b) and by side walls (43a, 43b) of the supporting structure (4a, 4b) which carry out a continuous perimeter edge of the bottom (42a, 42b), joined to the bottom (42a, 42b) without interruption in the material which said single metallic sheet is made of and completely surrounding the bottom (42a, 42b) in accordance with a closed curve around the depth direction (X1, X2) of the connecting body (2a, 2b), the side walls (43a, 43b) enclosing the bottom (42a, 42b) on all sides both in the central part (40a, 40b) and in the two end portions (41a, 41b) seamlessly".

VI. Reference is made to the following documents:

D11: US1083622 B1
D12: US1114026 B1
D25: CN2557653Y and its translation
D30: DE102005039509 B3
D34: DE3835391 A1

VII. The arguments of the parties relevant to the decision are set out in the reasons for the decision presented below.

Reasons for the Decision

1. The appeals are admissible.

2. Background

The invention relates to an "invisible", that is concealed hinge. This type of hinge generally comprises two connecting bodies, one mounted on the jamb side and the other on the door side, which are connected to each other by an articulation device (see published patent specification, paragraphs [0001] and [0002]).

3. Main request, added subject matter

3.1 Claim 1 as granted is based on claim 1 as originally filed. Both define an invisible concealed hinge having first and second connecting bodies, interconnected by an articulation device. Amongst other things, the first and/or the second connecting body comprises a supporting structure. This supporting structure has a

central part and two end portions on opposite sides of the central portion.

- 3.2 During opposition proceedings, the main request was formulated which adds the following feature to the end of claim 1 as granted: *the side walls (43a, 43b) enclosing the bottom (42a, 42b) on all sides both in the central part (40a, 40b) and in the two end portions (41a, 41b) seamlessly.*

Although the wording as such was taken from the description (see published application, page 12, lines 5 to 15), the opposition division considered it formed part of a description of the particular embodiments shown in figures 4 to 6 and that extracting the feature from this context constituted an unallowable intermediate generalisation. In its decision (see reasons, points 18 and 19) the division found that the amendment to claim 1 changed the subject matter of claim 1 so that it covered [hypothetical] embodiments whereby the end portions contained flat portions [end portions not bounded by side walls], whereas in the originally disclosed embodiments the entire end portions were concave and the side walls defined a perimeter edge of the supporting structure. Therefore, the opposition division did not allow the main request.

- 3.3 The Board disagrees with this aspect of the decision. In the Board's view, the explicit features of claim 1 as originally filed already excluded the hypothetical embodiments considered by the opposition division and implied the feature added to the main request, for the reasons which will now be explained.

3.3.1 Claim 1 as originally filed defines that the supporting structure is "*shaped from a single metallic sheet in a single concave piece having concavity [...] defined from a bottom of the supporting structure and side walls of the supporting structure which carry out a continuous perimeter edge of the bottom, joined to the bottom without interruption in the material [of the metallic sheet] and completely surrounding the bottom in accordance with a closed curve around the depth direction of the connecting body*".

Contrary to how the appellant-opponent 2 has argued, the Board considers a supporting structure [...] *in a single concave piece* means that the supporting structure as a whole constitutes a concave form, rather than it merely having a concave part and possibly other parts which are not concave. In original claim 1, this idea is confirmed by the structure being defined *from its bottom and side walls*, the latter completely surrounding the bottom as a *continuous perimeter edge*.

Thus, original claim 1 (and as granted) defines perimeter side walls which rise from the bottom of the cavity to laterally delimit the entire supporting structure on all sides, just as the bottom delimits the the entire supporting structure in the depth direction. Contrary to how the appellant-opponent 2 has argued, this excludes the claim covering a [non-disclosed] supporting structure with flat, that is non-concave, end portions extending laterally beyond the side walls. Moreover, since the entire supporting structure includes a central part and the end portions, not just the central part but also each end portion comprises part of the bottom and is bounded by side walls. Thus, original claim 1 implicitly defines the supporting structure to have a bottom that is *enclosed by the side*

walls both in its central part and its two end portions. This is also consistent with all the embodiments, including those of figures 4 to 6 as the appellant-proprietor has argued.

Furthermore, given that original claim 1 defines that the support structure is made from a *single metallic sheet* and that its side walls form a *continuous outer edge of the bottom without interruption in the material*, it is also implicit that the side walls enclose the bottom *seamlessly*.

3.3.2 Thus, rather than constituting a new teaching as the opponent 2 has argued, the added feature in claim 1 of the main request (the *side walls enclosing the bottom on all sides both in the central part and in the two end portions seamlessly*) merely renders explicit what was already implicitly disclosed in claim 1 as originally filed. Therefore, the objected feature does not add subject matter extending beyond claim 1 as originally filed.

3.4 The Board concludes that claim 1 of the main request meets the requirements of the Article 123(2) EPC.

4. Main request, claim 1, novelty with respect to D25

D25 discloses a concealed hinge for doors. In its communication (see points 4.2.6 and 4.2.7) the Board considered the matter of novelty with respect to D25 and concluded that D25 did not take away novelty of the subject matter of claim 1 of the main request. Amongst other things, the Board was of the opinion that D25 did not disclose a *supporting structure shaped from a single metallic sheet in a single concave piece*. The Board wrote the following:

4.2.6 The Board is also of the opinion that D25 does not directly and unambiguously disclose the feature of the supporting structure being shaped from a single metallic sheet in a single concave piece (feature 1.13). Rather, it leaves open how it is formed. The appellant-opponent 2 did not address this issue in its reply to appeal of 18 January 2023, point 2. However, it did discuss the same feature in its appeal grounds, section IV in the context of inventive step of auxiliary request 1 (as maintained). There, the appellant-opponent 2 identified it as a differing feature with respect to D25.

Neither in written proceedings nor at the oral proceedings did the parties comment further on this part of the Board's preliminary opinion, in particular the issue as to whether the supporting structure of D25 was *shaped from a single metallic sheet*. Therefore, the Board confirms its preliminary opinion that D25 does not disclose this feature and thus, at least for this reason, does not take away the novelty of the subject-matter of claim 1.

5. Main request, claim 1, inventive step starting from D30 with D34
- 5.1 D30 (see abstract and its figure) discloses a concealed hinge having first and second connecting bodies. It also has an articulation device 6 that connects the connecting bodies. As shown in figure 3, each connecting body has a respective supporting structure having a concave central part and, at its opposite sides, two end portions for accommodating fixing means.

5.2 D30 does not explain how its *supporting structure* is produced. At most it only explains that the *articulation device* can be cast (see paragraph [0012] and claim 15). Therefore, the subject matter of claim 1 differs from D30 at least in that the supporting structure is shaped from a single metallic sheet. Based on this difference, opponent 2 (see the reply to the patent proprietor's appeal dated 18 January 2023, page 8, second complete paragraph) held that the skilled person must select a suitable production process for D30's supporting structure. This has been considered as the objective technical problem to be solved by opponent 2 and is accepted by the Board to its advantage.

5.3 The opponent 2 furthermore argued that the skilled person would find such a suitable process in D34, namely a punch-press production process (cf. column 1, lines 1 to 14 with figure 1), and in so doing they would arrive at a concealed hinge according to the subject matter of claim 1.

5.4 The Board does not find this convincing. As seen in D30, figure 3, the geometry of the single piece supporting structure 4 manifests wide variations in thicknesses across its structure as well as sharp angles. On the other hand, D34's punch-press process, starting as it does from thin sheet steel, appears to provide a supporting structure of simple geometry with substantially uniform thickness and rounded angles. The Board is not convinced that, given the geometry of D30's supporting structure, D34's punch-press process would be suitable for its manufacture. In the Board's view, the latter process would always result in a thin walled piece of approximately uniform thickness, rather than one having the geometry of a supporting structure

as shown in D30, figure 3. Therefore the skilled person would not combine the teachings of D30 and D34 in the hope of solving the objective problem (finding a suitable production process for D30's supporting structure).

- 5.5 Moreover, the Board is not convinced that the arrangement shown in D30, figure 3, has side walls which form the periphery of a bottom in the end portions of the supporting structure, that is those portions intended to interact with and/or accommodate fixing means, as the Board understands claim 1 to require. Rather, in D30, the end portions with their fixing-screw holes 13, are flat extensions of the supporting structure without a bottom bounded by side walls.
- 5.6 At the oral proceedings before the Board, the appellant-opponent 2 argued to both these points that the skilled person, having decided to produce D30's supporting structure by a punch-press process, would suitably adapt the device shown in D30, figure 3 so that it could be formed by punch-pressing a thin sheet. In so doing, so the appellant-opponent 2 argued, the skilled person would arrive, amongst other things, at a supporting structure having respective end portions with a bottom bounded by peripheral side walls as claimed, rather than being flat.
- 5.7 The Board does not find this convincing. If using the punch-press process would require an adaptation of D30's supporting structure, the skilled person would simply not combine the teachings of D30 and D34 in the first place. Even if the skilled person were to consider combining these teachings (the Board holds that they would not), the necessary further steps of

geometrical adaptation of D30's supporting structure would go beyond the mere application of the skilled person's routine skills. Therefore, the Board is not convinced by the appellant-opponent 2's objection that the subject matter of claim 1 lacks inventive step starting from D30 in combination with D34.

6. Inventive step starting from D11 or D12 in combination with D25

6.1 D11 (see for example figures III and VI) discloses a support structure for a concealed hinge having a concave central part and end portions on opposite sides. D11 does not disclose that a respective end portion has a bottom enclosed by side walls (cf. appellant-opponent 2's reply to the proprietor's appeal, page 9 section 2). Indeed, the end portions are flat plates with fixing holes 10' (cf. page 1, line 108 to page 2, line 4 with figure III).

6.2 D12 discloses a support structure for a concealed hinge which has a similar structure to that of D11. It has a central part *i* which is concave and end portions made of flat plates *g* and *h* (see page 1, lines 52-55 and figure 3).

Therefore, claim 1 differs from both D11 and D12 at least with regard to the feature of side walls enclosing the bottom on all sides including in the two end portions.

6.3 The appellant-opponent 2 has argued that the objective technical problem to solve is one of increasing the strength of the end parts and that the skilled person would recognise in D25 that the presence of a concave area in the end parts would increase strength.

Therefore, the skilled person would replace the flat plate end portions of D11 or D12 with concave end portions having peripheral side walls surrounding a bottom, and thus, so the argument goes, arrive at the subject matter of claim 1 as a matter of obviousness.

6.4 Whether starting from D11 or D12, the objections are predicated on D25 disclosing end portions with a concavity defined by peripheral side walls and a bottom. The opposition division (see impugned decision, reasons, point 42) considered that D25 did not disclose this feature, and the Board agrees with this assessment.

6.5 D25 (see figures 1 and 2 and its translated description) discloses a concealed hinge for a door. It has two symmetrical hinge bases, thus two supporting structures, each of which has a central part and two end portions for fixing means. The appellant-opponent 2 does not dispute that the end portions of D25's respective supporting structures are neither described as having a concavity nor a bottom and side walls. According to D25 "*the hinge base is concave in the middle, and the upper and lower sides [end portions] are fixed mounting panels*" (see translation, page 1, description, first three lines). Therefore, if the disputed feature (end portions with part of the bottom and peripheral side walls) were to be disclosed in D25 it could only be found in the drawings.

6.6 Figure 1 shows a top view of the hinge. Each of the supporting structures is shown with a double lined perimeter. The appellant-opponent 2 has argued that it is generally known that such lines represent side walls and the skilled person would conclude that, not only the central part of each supporting structure but also

its end portions comprise bottoms bounded by side walls.

6.7 The Board does not find this convincing for the following reasons: Figure 2 shows the support structures of figure 1 in cross section along the plane AA that is indicated in figure 1 (in the recessed central part). In figure 2, the cut-through of the side walls of the central part are shown in cross-hatch and their width is about the same as the spacing between the double perimeter lines shown in figure 1. However, looking towards the side parts shown, the open ends of the side walls of each respective supporting structure are joined by a horizontal line (at the bottom of figure 2). This can but represent the outer extent of the end portions in the vertical direction. Therefore, according to figure 2, the end portions seen do not have a bottom bounded by peripheral side walls but rather are flat and lie flush with the side walls in the central part. Whilst it might be that the double peripheral lines in figure 1 could represent side walls seen from above, including in the end portions, no such side wall is present in figure 2.

In this regard, the appellant-opponent 2 (cf. its appeal grounds, page 9) has argued that D25, figure 2, being a cross sectional view, would only be accurate along the cut plane AA but not elsewhere (where the end portions are shown) since the latter need not be accurately represented in such a patent drawing. The Board is not aware of any convention in patent drawings by which in a cross sectional view, only components that are cut through should be accurately represented. In other words, the opponent 2 has not convincingly explained why the Board should consider figure 1 of D25 accurate but figure 2 to be inaccurate. In the Board's

view, at the very least there is a discrepancy between the two drawings with regard to the representation of the end portions, the one showing them to be flat without side walls bounding them and the other possibly showing them to have a bottom bounded by side walls. In the light of this discrepancy, the Board holds that D25 does not directly and unambiguously disclose end portions having side walls as claimed. Consequently, however obvious the combinations of D11 or D12 with D25 might be, they would not result in a hinge with a supporting structure with side walls enclosing the bottom on all sides, including in the end portions as claimed. Therefore the opponent 2's inventive step objections starting from D11 or D12 with D25 are not convincing.

7. Main request, claim 1, inventive step starting from D25 with D34

The appellant-opponent 2 has also argued that D25 discloses all features of claim 1 except for its supporting structure being shaped from a single metallic sheet. It argued that this feature would be obvious to the skilled person in the light of D34. However, as the Board has explained above (section 6), D25 does not directly and unambiguously disclose at least a further feature, namely that in the end portions, side walls enclose the bottom. Nor has it been argued that this feature might be disclosed in D34. Therefore, the appellant-opponent 2's argument that the combined teachings of D25 and D34 would lead the skilled person to all the features of claim 1 and thus take away inventive step of the claim, is moot.

8. From the above, the Board concludes that the subject matter of claim 1 of the main request is both new and involves an inventive step with regard to the prior art cited by the appellant-opponent 2. The Board reaches this conclusion based only on consideration of the arguments submitted by the opponent 2. In the light of this, the request of the opponent 2 for the non-admittance of submissions made by the appellant-proprietor with regard to novelty and inventive step of the main request, made for the first time at the oral proceedings before the Board, is moot.

9. No further objections against the main request were on file at the end of the oral proceedings before the Board, an objection of insufficiency of disclosure against the main request was withdrawn by the opponent 2 at the oral proceedings. Nor did the parties or the Board see any need to adapt the description. Since, contrary to the opposition division's findings, the Board finds that the main request does not add subject matter extending beyond the content of the application as filed and that other objections raised against the main request by the appellant-opponent are not convincing, the Board must set aside the decision. Pursuant to Article 101 (3) (a) EPC, the patent can therefore be maintained as amended according to the main request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent in the following version:
 - claims 1 - 39 according to the Main Request filed with the Grounds of Appeal,
 - description and drawings according to the patent specification.

The Registrar:

The Chairman:



G. Magouliotis

A. Pieracci

Decision electronically authenticated