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**Datasheet for the decision
of 28 January 2021**

Case Number: T 1271/16 - 3.2.05

Application Number: 05803992.6

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Language of the proceedings: EN

Title of invention:
Holder and method for shaping a sound tube

Patent Proprietor:
GN ReSound A/S

Opponent:
Sivantos Pte. Ltd.

Relevant legal provisions:
EPC 1973 Art. 54, 56, 100(a)
RPBA Art. 12(4)
RPBA 2020 Art. 25(2)

Keyword:
Novelty - main request (yes)
Inventive step - main request (yes)
Late-filed document - admitted (yes)

Decisions cited:

T 0606/89, T 0432/12



Beschwerdekammern

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Case Number: T 1271/16 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 28 January 2021

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
15 March 2016 concerning maintenance of the
European Patent No. 1819500 in amended form.**

Composition of the Board:

Chairman P. Lanz
Members: B. Spitzer
A. Bacchin

Summary of Facts and Submissions

- I. The opponent and the patent proprietor appealed against the interlocutory decision of the opposition division maintaining European patent No. 1 819 500 as amended according to the second auxiliary request.
- II. During the opposition proceedings, the opponent had raised the grounds for opposition according to Article 100(a) EPC in conjunction with Articles 54 and 56 EPC (lack of novelty and lack of inventive step).
- III. In agreement with both parties, oral proceedings before the board of appeal were held on 28 January 2021 as a video conference.
- IV. The requests of appellant II (patent proprietor) were that the decision under appeal be set aside and that the patent be maintained as granted (main request) or, as an auxiliary measure, that the decision under appeal be set aside and that the patent be maintained according to one of the first to sixth auxiliary requests filed with the statement setting out the grounds of appeal.
- V. The request of appellant I (opponent) was that the decision under appeal be set aside and that the patent be revoked.
- VI. The documents cited during the appeal proceedings include the following:

D1: DE 39 39 352 A1

D2: WO 99/04601 A1

D3: US 6,228,307 B1

D6: EP 1 448 014 A1

VII. Claim 1 according to the main request reads as follows:

"**[M1.1]** A holder (100) for shaping a sound tube (14) for a BTE hearing aid (10), the sound tube (14) having a first end that is attached to a first connector for coupling of the sound tube (14) to the BTE housing (12) and a second end that is attached to a second connector for coupling of the sound tube (14) to an earpiece (16) of the BTE hearing aid, the holder (100) having **[M1.2]** an external surface (112, 114) for imparting the shape of the surface (112) to the sound tube (14), **[M1.3]** a first attachment element (116) that is adapted to receive and hold the first connector, **[M1.4]** a second attachment element (118) that is adapted to receive and hold the second connector thereby keeping the sound tube (14) in abutting contact with at least parts of the external surface (112) whereby the external surface (112) imparts the shape of the surface (112) to the sound tube (14)."

Claim 14 according to the main request reads as follows:

"**[M14.1]** A method of shaping a sound tube (14) for a BTE hearing aid (10) **[M14.2]** utilizing a holder (100) according to any of the preceding claims, **[M14.8]** comprising the steps of unreeling a desired length of sound tube (14) from a storage reel, **[M14.9]** cutting the desired length of sound tube (14), **[M14.10]** overmoulding a first connector, **[M14.11]** overmoulding a second connector, **[M14.12]** mounting the sound tube (14) onto the holder (100) by

attaching the first connector to the first attachment element (116),
bending the sound tube (14) along the external surface (112, 114) and
attaching the second connector to the second attachment element (118), and [M14.13] heating the holder (100) with the sound tube (14),
[M14.14] cooling the holder (100) with the sound tube (14), and [M14.15] removing the sound tube (14) from the holder (100)."

VIII. Appellant I's arguments can be summarised as follows:

Admission of document D6

Document D6 should be admitted into the proceedings because it was explicitly cited in the patent in suit (see paragraph [0005]). In addition, it was an application of the patent proprietor. Document D6 disclosed a resilient fibre and therefore was relevant for claim 12 of the second auxiliary request which the opposition division had considered allowable. Document D6 had already been introduced during the oral proceedings in opposition proceedings. However, its admission had not been discussed at that stage for reasons of procedural economy.

Main request, lack of novelty

The features of claim 1 had to be interpreted in a broad sense. The holder (M1.1) was not limited with respect to the complexity of the holder, i.e. whether it was composed of one or several parts. A holder having movable parts was covered by claim 1. Such a holder was shown in Figures 9 to 11 of the patent in suit. The holder according to claim 1 just had to be

suitable for shaping a sound tube for a BTE (behind-the-ear) hearing aid.

Claim 1 specified neither whether the functional features were related to the beginning or the end of the shaping process. The external surface (feature M1.2) was not limited regarding the shape of the surface. Its shape was subject-matter of dependent claims 2 and 4.

The first and second attachment elements (features M1.3 and M1.4) were merely defined as being adapted to receive and hold the first and second connectors, respectively, and for the second attachment element "thereby keeping the sound tube in abutting contact with at least parts of the external surface". The attachment element could be composed of one or several parts. Reference was made to paragraphs [0015], [0064] and [0065] of the patent in suit and to Figures 9 to 11, where an attachment element in the form of a gripping device was mentioned. The attachment element according to claim 1 could be composed of a single protrusion as mentioned in dependent claim 9 or paragraph [0057] of the patent in suit. A simple pin might fall under the term "protrusion". Alternatively, in dependent claim 7, the attachment element might be a groove for receiving the sound tube that ended in a compartment accommodating the first connector. It was not claimed that the connector exactly fitted into the compartment. This was shown by referring to the embodiment of Figure 7 of the patent in suit and its schematic drawings as filed during the oral proceedings (see its drawings below). Figure 6 of the patent in suit was also referred to in which the connector (shown in appellant I's drawings below) merely abutted a surface of the attachment element 118 (shown in

appellant I's drawings below). Consequently, a surface might be an attachment element within the meaning of the patent in suit.

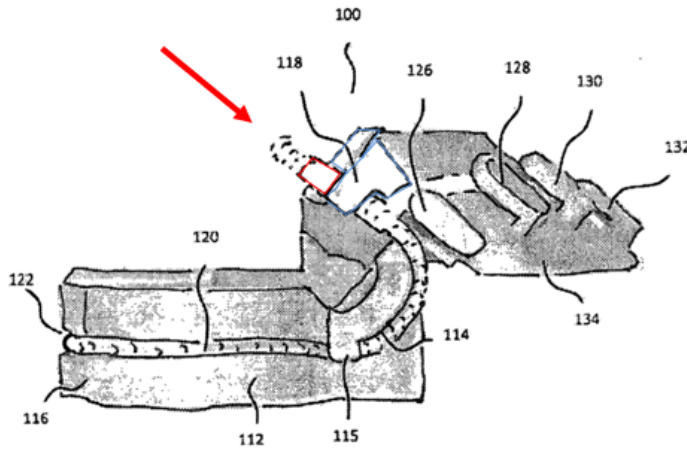
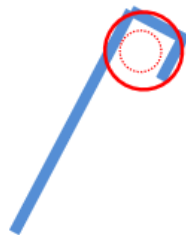
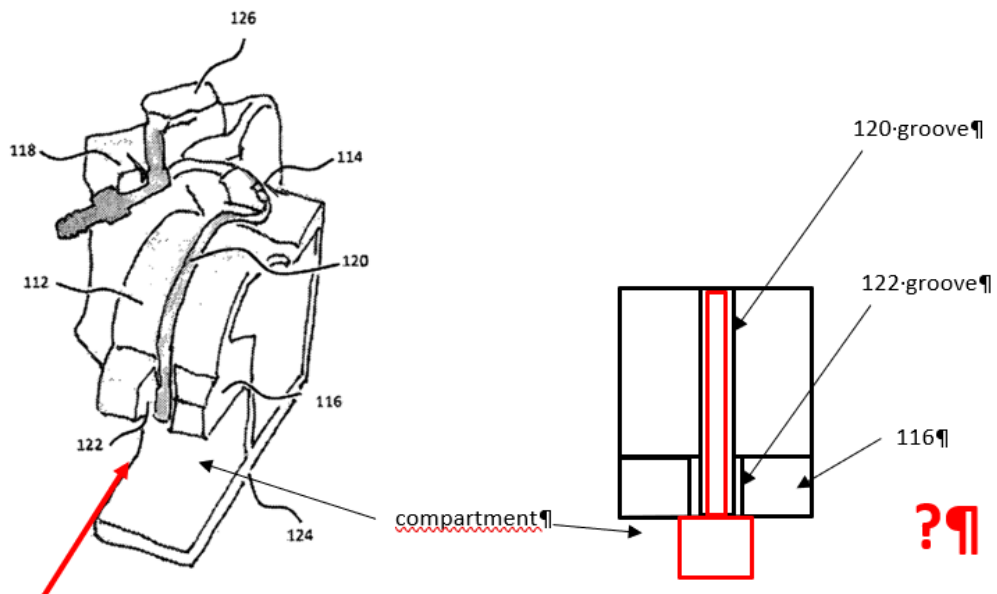


Fig. 6



[0056] "The attachment element is shaped as a protrusion... or as a fork or a "U" for reception and accommodating of the second connector." ¶



Novelty of the subject-matter of claim 1 was contested vis-à-vis document D3. The holder according to claim 1 had an external surface, a first attachment element and a second attachment element. The remaining features were merely functional features. Document D3 disclosed a method and a device for bending a component in the field of personal care appliances (see column 1, lines 12 to 18). To bend a tube-shaped section (see Figure 2: 14), there was a holder 24, having engagement surfaces 18 and 26 on the upper side and surface 27 on the lower side. These surfaces were adapted to receive and hold a first or second connector. The functional feature did not specify the structure of the connectors and had to be interpreted in its broadest sense. Conical connectors like the tip 17 in document D3 (see Figure 1) were comprised in the definition of claim 1 of the patent in suit.

Item 2.2 of the decision under appeal stated that the tube length in document D3 amounted to approximately 8 mm, which was too short compared to the length needed

for sound tubes for BTE hearing aids. The opposition division derived this length from Figure 1 by proportionally transferring the bore diameter (see column 1, lines 44 to 45). However, the figures of document D3 were not true to scale. Furthermore, document D3 referred to products such as a dental care, hair care or kitchen apparatus. Hence, the length varied over a broad range of up to 50 mm or more for kitchen apparatuses, for example. Furthermore, claim 1 of the patent in suit remained silent about the length and the shape of the sound tube. BTE hearing aids for a child and an adult had different dimensions. The tube might have one bend only. This could be seen from dependent claims 2 and 4.

Referring to the arguments that a surface per se could not hold a component and that in document D3 separate elements were necessary to hold the component 10, it was emphasised that the "attachment element" feature had to be interpreted in a broad sense. Claim 1 of the patent in suit did not define when the functional features had to be fulfilled. As it might be at the end of the bending and as Figure 2 of document D3 showed the situation after bending, the holder 24 of document D3 fell under the scope of claim 1.

Moreover, the attachment element in claim 1 was not limited to a single piece. Thus, the whole holding device of document D3 (see column 5, lines 11 to 13; Figure 2: 27, 36) could be compared to the holder according to claim 1 of the patent in suit. The holder of document D3 had an external surface (see Figure 2: 28). Figure 3 of document D3 comprised an outer forming tool 44, which, however, was optional. The surface 26 (see Figure 2) together with "a holding device not illustrated in this Figure" (see column 5,

lines 12 to 13) constituted the first attachment element. Bending tool 36 and surface 27 formed a second attachment element (see Figure 2). These elements also fulfilled the functional features that they were adapted to receive and hold the shank 12 and the tip 17, respectively. Tool 36 kept the element 10 in abutting contact with at least parts of the external surface 28. Therefore, the functional feature for the second attachment element "thereby keeping the sound tube in abutting contact with at least parts of the external surface" was also anticipated by document D3.

The holder (26, 28, 27, 36) of document D3 was also suitable for shaping a sound tube for a BTE hearing aid. Like in the patent in suit, a plastic tube was formed and shaped by bending a straight tube and fixing it with the application of heat. The component made by this device found application in a personal care appliance such as a dental care, a hair care, a kitchen apparatus or the like (see column 1, lines 16 to 18). The inner diameter of a few tenths of millimetres (see column 1, lines 45 to 46) was within the preferred range for sound tubes of 0.9 mm or less (see paragraph [0005] of the patent in suit, document D6, paragraph [0012]).

Main request, lack of inventive step, document D3 alone

In case the board of appeal concluded that the subject-matter of claim 1 was new vis-à-vis document D3, the claimed subject-matter lacked an inventive step. Document D3 was the closest prior art since it was concerned with the bending of tubes in a similar field. It also showed applications for personal care appliances, i.e. for the human body, like BTE hearing aids.

The objective technical problem was the adaptation of the device to the geometry of a sound tube for a BTE hearing aid. This would have been within the common general knowledge of the skilled person because the tip and the shank of component 10 (see Figure 1 of document D3) were comparable to the connectors of a sound tube. Only simple adaptations were necessary. Furthermore, claim 1 of the patent in suit did not specify a particular material or complex shape of the connectors. Due to the functional characteristics of features M1.3 and M1.4, the attachment elements had to be interpreted in a broad sense.

For these reasons, the subject-matter of claim 1 lacked an inventive step starting from document D3.

Main request, lack of inventive step, combination of document D2 with document D1

Claims 1 and 14 lacked an inventive step starting from document D2, which disclosed a BTE hearing aid with a sound tube 12 and connectors 16 and 18 at the ends (see Figure 1; page 7, lines 18 to 20). The sound tube 12 was shaped "by any known preforming process, such as heat forming or UV-light forming" (see page 8, lines 11 to 12). The tube was bent by a formed wire positioned within the tube and then heated for the tube to retain the shape (see page 8, lines 18 to 21).

According to paragraph [0009] of the patent in suit, such a method was slow and labour intensive. This indicated that the objective technical problem was to improve the shaping.

The skilled person would have considered document D1, which disclosed a device for bending plastic tubes by heating. It was directed to plastic tubes in general having a small diameter (see column 1, lines 3 to 13). Although tubes for the automotive sector were mentioned, the dimensions were in the same range as in document D2. Document D1 was for tubes having a diameter from 4 mm to 20 mm (see column 1, line 11) compared to an outer diameter of about 3 mm for sound tubes in document D2 (see page 9, line 1). The application in document D1 was not limited to the automotive sector, which was merely listed as an example. The bending of plastic tubes with a small diameter was a generally known and simple technique, which could be applied broadly to other fields. Document D1 was concerned with the same problem since it mentioned in column 1, lines 30 to 48, that known processes were laborious.

Figure 1 of document D1 showed a holder (M1.1) having a groove where the tube was held. The holder had a surface with several bends (M1.2). To position the sound tube correctly, the skilled person would have used surface 10 in document D1 (see Figure 1) as the contact surface for the connector members 28 and 30, which had been overmoulded onto the ends 16 and 18 of the sound tube 12 (see document D2, page 8, lines 11 to 16). Features M1.3 and M1.4 were, thus, known from Document D1.

The opposition division argued in the decision under appeal that the tube in document D1 was already fixed by pressing it into the groove. Hence, the skilled person would not have been prompted to provide a first and a second attachment element (see page 10 of the

decision under appeal). However, by simply pressing the tube into the groove, the relative position between the connectors was not yet fixed. Therefore, the skilled person would have realised there was a need for additional attachment elements. For this, they could have used the surface 10. Due to the broad definition of the attachment element in claim 1 (see above under lack of novelty), a surface fell under the scope of claim 1. Even in the patent in suit (see Figures 3 and 4 and dependent claim 7), a groove 122 for receiving and holding the sound tube in addition to the attachment element for the connector was not excluded.

The argument that the holder of document D1 did not need any additional attachment element since the tube was fixed in the groove could not be accepted. The surfaces 10 in document D1 defined a fixed distance for the connectors. The question of whether there were further attachment elements was not relevant. In fact, the patent in suit also disclosed further attachment elements (see Figure 4: 126 to 132; 114, 115).

Consequently, the subject-matter of claim 1 was rendered obvious by a combination of documents D2 and D1.

The same arguments applied for the method of claim 14. Features M14.8 and M14.9 (unreeling and cutting) were normal measures since sound tubes were typically delivered in continuous length on rolls. The overmoulding steps (see features M14.10 and M14.11) were known from document D2 (see page 8, lines 14 to 16). The mounting of the sound tube according to feature M14.12 resulted from the use of the holder of document D1. The same was true for method steps M14.13 to M14.15 (see document D1, column 1, lines 1 to 9).

Therefore, the subject-matter of claim 14 was not inventive.

Main request, lack of inventive step, combination of document D6 with document D1

The same arguments for the combination of documents D2 with D1 applied when starting from document D6. Document D6 disclosed a BTE hearing aid with a sound tube 20 (see paragraph [0010]). The objective technical problem was to find a suitable method for shaping such a plastic tube. For the same reasons as mentioned above, the skilled person would have taken into consideration the teachings of document D1 and arrived at the claimed invention. The arrangement of connectors at each side of the sound tube would have been obvious for the skilled person.

IX. Appellant II essentially argued as follows:

Non-admission of document D6

Document D6 was late-filed and should not be admitted into the proceedings. It was correct that this document showed a resilient fibre. However, the resilient fibre was a feature of dependent claim 12 as granted and could therefore not serve as justification for the late filing of document D6. In accordance with T 432/12, a sound and plausible reason was required for filing a new document only in the appeal proceedings. As document D6 was mentioned as background art in the patent in suit, there was no proper justification for its late filing. Moreover, the opponent did not raise any objections against the subject-matter of independent claim 12 considered allowable by the opposition division (see decision under appeal, item

4.3). Finally, document D6 was not prima facie highly relevant as it did not disclose a holder for shaping a sound tube.

Main request, novelty

The holder of document D3 was not suitable for shaping tubes having dimensions falling within the range of sound tubes for BTE hearing aids. Sound tubes of hearing aids had a smaller diameter and were much longer compared to component 10 of document D3. The device worked for short tubes only. This was confirmed in the decision under appeal. Due to the complex shape of sound tubes for BTE hearing aids and in view of the required accuracy, the device of document D3 could not be used as a holder for shaping a sound tube for a BTE hearing aid.

There were more differences since document D3 did not disclose a first attachment element adapted to receive and hold the first connector and a second attachment element adapted to receive and hold the second connector. The decision under appeal considered the straight engagement surfaces 26 and 27 of document D3 to be first and second attachment elements. However, a straight or plane engagement surface could not be adapted to receive and hold a connector. No connectors were shown in document D3; only a tip and a shank of a tube were shown. Document D3 did not disclose a holder for shaping a sound tube. Rather, it related to a device for bending a component for which a separate holder was required (see column 5, lines 11 to 13, and column 1, lines 57 to 58; Figure 6: 70). Therefore, claim 1 was novel in view of document D3.

The whole device of document D3 was a shaping tool and

could not be considered a holder. Surface 28 was not an external surface as it was facing the outer forming tool 44 (see Figure 3). Moreover, surface 27 and the bending tool 36 were not adapted to receive and hold a connector. The bending tool 36 moved towards the forming tool 24, thus bending the tube until it engaged the forming face 28 (see column 5, lines 21 ff). Although the attachment element of claim 1 might have many forms, e.g. gripping means, its function was to receive and hold the connector. Surface 27 abutted the tip 17 of element 10 but did not receive it. The same argument applied for the first attachment element 26 together with a holder not illustrated in the figures of document D3. Document D3 did not disclose how the shank 12 of element 10 was fixed to surface 26. The end parts of element 10 were not received but pushed towards the surface 27 or 26. This did not work for hearing aids, in which the connectors were made of a separate material and did not have to withstand so much pressure. Additionally, in Figures 3 and 4 of document D3, heat was applied only to the tube and not to the holder as a whole.

Main request, inventive step, document D3 alone

The closest prior art was normally directed to a similar use and required a minimum of structural and functional modifications to arrive at the claimed invention (see T 606/89).

Document D3 was not a suitable starting point since it was directed to the bending of personal care appliances, like for dental care, i.e. simple and cheap products for single use. BTE hearing aids were complex technical devices requiring high accuracy that had to provide long-term use. They could not be compared to

single-use products. Furthermore, document D3 did not disclose features M1.1, M1.3 and M1.4. Thus, there were significant differences. As document D2 related to BTE hearing aids and a forming method, the skilled person would rather have taken document D2 as the starting point.

Should they nevertheless have started from document D3, the objective technical problem would be to provide a more expedient and cost effective way of producing sound tubes for BTE hearing aids with the required accuracy of the position of the bends and/or rotational position of the connectors. However, the skilled person would have found no indication in document D3 on how to modify the holder. The device of document D3 comprised several independent parts, including at least bending tool 36, inner forming tool 24 and outer forming tool 44. As could be seen from Figure 6 of document D3, the shaping device had three different rotational axes and was a complex device. The attachment elements were not adapted according to the patent in suit and applied a pressure. This was not suitable for the connectors of a BTE hearing aid. The skilled person would not have adapted the attachment elements without hindsight.

In addition, the device of document D3 would not have been suitable for shaping longer parts, like sound tubes for hearing aids, which, in addition, had a complex shape. In particular, in document D3, heating and cooling had to be performed separately for each tube. This would not have been suitable for automation.

Main request, inventive step, combination of document D2 with document D1

Document D2 might be regarded as the closest prior art since it related to a similar purpose as the claimed invention. It taught to position a wire within the sound tube, thus bending it to the desired shape. After heating and cooling, the wire was removed. Document D2 did not disclose a holder as a wire was not a holder. There were no first and second attachment elements adapted to receive and hold the first and second connectors.

These differences had the technical effect of allowing handling sound tubes by their ends, snapping the connector ends of the sound tube into the respective attachment element of the holder. Thus, sound tubes for BTE hearing aids were produced in a more expedient and cost effective way. The objective technical problem was to provide a more expedient and cost effective way of producing sound tubes for BTE hearing aids with the required accuracy of the position of the bends and the rotational position of the connectors.

Document D1 disclosed a process for forming small thermoplastic tubes. The known method was improved by fixing thermoplastic tubes over the whole length. The apparatus of document D1 was used in the automobile engineering, which was a completely different field. The tubes had no connectors. The diameter was larger: 4 mm to 20 mm compared to 0.5 mm to 2.0 mm in the patent in suit (see paragraph [0026]) or to an outer diameter of about 1.6 mm or less (see document D2, page 3, line 27). The hardness of the tubes was also different. Sound tubes of BTE hearing aids had a hardness of

around 65 to 85 Shore D (see paragraph [0012] of document D6). Hence, they could not be easily compressed and press-fitted into the holder of document D1. Due to these reasons, the skilled person would not have turned to document D1 for a solution to the above technical problem.

Even if the skilled person would have considered document D1 in combination with document D2, they would only have shaped a part of the sound tube without any attachment means as the tube was clamped into the holder (see document D1, column 1, lines 54 to 58). According to document D1 (see column 1, lines 45 to 53 and lines 54 to 58), additional locking elements were disadvantageous. However, the attachment means for the connectors were important since they had to be aligned to each other to get the hearing aid to function correctly and the first and second connectors positioned correctly.

Thus, neither document D1 or D2 disclosed any attachment element for receiving and holding the connectors of the sound tube. Reference was also made to item 3.2 of the decision under appeal, where it was stated that the skilled person could have but would not have provided surfaces being adapted to receive and hold the first and second connectors as the tube was already fixed to the form along its entire length.

Moreover, surface 10 was not adapted to receive and hold connectors for BTE hearing aids.

Method claim 14 of the main request referred to utilising a holder according to any of the preceding claims and, thus, was equally new and inventive.

Main request, inventive step, combination of document D6 with document D1

Document D6 disclosed a BTE hearing aid with a resilient fibre. It did not discuss any holder for shaping a sound tube and would therefore not have been selected as the closest prior art. Otherwise, the same arguments applied as set out above for document D2 in combination with document D1.

Reasons for the Decision

1. Admission of document D6

1.1 Legal basis

The appeal has been filed by letter dated 12 May 2016. Therefore, according to Article 12(4) RPBA 2007, which continues to apply to these proceedings (Article 25(2) RPBA 2020), the board, in the exercise of its discretion, may hold inadmissible facts, evidence or requests which could have been presented or were not admitted in the first-instance proceedings.

1.2 In the case at issue, document D6 had been filed during the opposition proceedings after the expiry of the time limit for filing the opposition under Article 99 EPC 1973. During the oral proceedings in opposition proceedings (see item 6.2 of the minutes of the oral proceedings before the opposition division), appellant I had requested that the opposition division admit this document. However, the opposition division did not decide on the this issue because it was considered unnecessary as document D6 would not have changed the opponent's argumentation with respect to

inventive step. In addition, the board notes that document D6 is a patent application by the proprietor of the patent in suit which it had already cited in the application documents for the patent in suit (see [0005] of the description). Documents cited in a contested European patent do not, in theory, automatically form part of the opposition or opposition appeal proceedings unless they are indicated as closest prior art (T 0536/88, Headnotes I and II). However, they constitute facts the board may take into account in the exercise of its discretion when deciding on the admittance of such a document into the appeal proceedings since the content of a document cited in the contested European patent and stemming from the patent proprietor itself cannot be held to surprise the patent proprietor.

It was also not disputed by the parties that document D6 was relevant for the features of claim 12 of the second auxiliary request, which the opposition division had considered allowable, as well as of further auxiliary requests.

Finally, the rationale of decision T 432/12, which was referred to by appellant II, is not applicable in the present case as there "the decisive issue was whether there was a sound and plausible reason in this specific case for filing documents only in the appeal proceedings (see Case Law of the Boards of Appeal of the European Patent Office, 9th edition, 2019 A. 4.11.3a)". By contrast, in the case at hand, document D6 was not filed only in the appeal proceedings but had already been submitted in the first-instance proceedings.

For these reasons, the board exercised its discretion under Article 12(4) RPBA 2007 and decided to admit document D6 into the proceedings.

2. Main request - Lack of novelty of claim 1

Novelty of the subject-matter of claim 1 was contested vis-à-vis document D3. In one line of argument, the forming tool 24 of document D3 was considered a holder according to claim 1 (see item 2.2 below). In a further line of attack, the whole device of document D3 was regarded a holder within the meaning of claim 1 (see item 2.3 below). Since claim 1 comprises few structural technical features, which are further defined in functional terms, the interpretation of these features is important for the assessment of novelty.

2.1 Interpretation of features

Feature M1.1

"A holder for" should be interpreted as "A holder suitable for". Feature M1.1 requires that the holder be suitable for shaping a sound tube for a BTE hearing aid. The sound tube is defined as having a first end attached to a first connector for coupling the sound tube to the BTE housing and a second end attached to a second connector for coupling the sound tube to an earpiece of the BTE hearing aid.

To be suitable for shaping such a sound tube, the holder has to be suitable for shaping tubes having in general very small dimensions in the magnitude of less than a few millimetres. As the sound tube has two ends with connectors, the holder has to be suitable for handling a tube which has connectors or corresponding

parts at each end.

The board agrees with appellant I that there are no limitations in claim 1 restricting the holder to one single part. The holder might comprise several parts which could also be movable. This is reflected, for instance, in Figures 9 to 11 of the patent in suit.

Feature M1.2

Essentially the same interpretation applies to feature M1.2. Claim 1 does not define a specific shape of the sound tube. It is thus important to note that the holder's external surface for imparting the shape of the surface to the sound tube is not directed to a specific shape as defined, for instance, in dependent claims 2 and 4.

Features M1.3 and M1.4

Features M1.3 and M1.4 define a first/second attachment element adapted to receive and hold the first/second connector. The first and second attachment elements are further specified in dependent claims 7 and 9, respectively. Feature M1.4 contains the additional requirement of "thereby keeping the sound tube in abutting contact with at least part of the external surface".

Appellant II outlined that the attachment elements were very important for the sound tube "since the connectors for the sound tube need to be aligned to each other correctly in order to get a correct functioning of the hearing aid and correct positioning of the first and second connectors" (see letter 1 December 2016, page 4, penultimate paragraph). The board draws attention to

the fact that claim 1 is silent about any particular accuracy requirement regarding the positioning of the bend(s) and/or rotational positioning of the connectors.

Appellant I put forward that in accordance with the patent in suit (see Figures 9 to 11, paragraphs [0015], [0064], [0065]), an attachment element as defined in features M1.3 and M1.4 could comprise several parts which could also be movable, such as a gripping device.

The board agrees with appellant I on this point.

According to appellant I, an attachment element within the meaning of features M1.3 and M1.4 could simply be a surface. As shown in Figures 4 and 7, the groove 122 receiving the sound tube ended in a compartment accommodating the first connector. Appellant I argued that this compartment was very large and that the first connector abutted a surface. It also argued that the second connector abutted a surface, i.e. the surface of part 118. This can be seen in Figures 6 or 7 of the patent in suit.

The board emphasises that a simple surface cannot be considered an attachment element adapted to receive and hold the first/second connector. Rather, the cited embodiments corresponding to dependent claims 7 or 9 have to meet the functional requirements of features M1.3 and M1.4 of claim 1, i.e. to receive and hold a connector. Since this is generally not the case for any surface, the first and second attachment elements of features M1.3 and M1.4 cannot be interpreted in this way.

2.2 Novelty in view of forming tool 24 of document D3

As put forward by appellant I, part 24, a forming tool, shown in Figure 2 of document D3, can be considered a holder for shaping a component 10 (feature M1.1). The diameter of the component 10 (see column 1, lines 44 to 46) lies in the same range as the diameter of a sound tube for a BTE hearing aid (see paragraph [0026] of the patent in suit). However, part 24 alone is not suitable for the claimed purpose. The forming face 28 (see Figure 2) corresponds to feature M1.2.

Appellant I considers the straight engagement surface 26 of the forming tool 24 to be a first attachment element as it rests against the engagement surface 18 of the component 10 and the engagement surface 27 to be a second attachment element as it abuts the engagement surface 21 of the tip 17 (see Figure 2).

The board is of the view that, although the shank 12 and the tip 17 could be regarded as elements corresponding to the first and second connectors, the surface 26 alone cannot be considered a first attachment element adapted to receive and hold the connector (feature M1.3). Flat surfaces, such as surface 26, cannot receive and hold a component (see item 2.1 above). The same applies to surface 27 which, as such, cannot be considered the second attachment element (feature M1.4).

To hold component 10 on the holder 24, a further holding device is necessary (see column 5, lines 12 to 13). The tip 17 is held by the bending tool 36 (see Figure 2), and the shank is held by a separate holding device (see column 5, lines 11 to 12).

Therefore, features M1.3 and M1.4 are not anticipated by holder 24 of document D3, which is consequently not suitable for shaping a sound tube in accordance with claim 1.

2.3 Novelty in view of the whole device of document D3 (see Figures 1 to 3)

Appellant I put forward that alternatively the whole device for bending shown in Figures 1 to 3 of document D3 could be considered a holder according to feature M1.1. The forming face corresponded to feature M1.2; the holding device (see column 5, lines 11 to 12) together with surface 26 corresponded to a first attachment element (feature M1.3); and the bending tool 36 together with surface 27 corresponded to a second attachment element (feature M1.4).

The board agrees with appellant II that a holder according to M1.1 might comprise one or more parts (see item 2.1). This aspect is thus not sufficient for distinguishing the subject-matter of claim 1 from the arrangement known from document D3.

Feature M1.2 is anticipated by forming face 28 shown in Figure 2 of document D3. The board does not share appellant II's opinion that, in view of the presence of outer forming tool 44 (see Figure 3), the forming face 28 was not an external surface as defined by feature M1.2. The term "external" is not further specified in claim 1. According to Figure 3 of document D3, forming face 28 is an external surface of holder 14 which faces the surface of component 10. Since it imparts the shape of the surface to component 10, forming face 28 anticipates feature M1.2.

The holding device, which is not illustrated in Figure 2, together with the surface 26 (see Figure 2, column 5, lines 12 to 13) holds the shank 12 of component 10 and is regarded as a first attachment element. However, since the holding device is neither shown in the drawings nor further specified in the text, its configuration is not disclosed in document D3. Therefore, it cannot be clearly and unambiguously derived from document D3 whether the (unspecified) holding device is adapted to receive and hold a first connector of a BTE hearing aid. Consequently, feature M1.3 is not disclosed in document D3.

Essentially the same arguments apply for the second attachment element of feature M1.4. In document D3, bending tool 36 moves towards the forming tool 24 by which section 14 of component 10 is bent until the frustoconical engagement surface 21 at the tip 17 abuts the second straight engagement surface 27 (see Figures 1 and 2, column 5, lines 21 to 33). Surface 27 together with bending tool 36 serves as an attachment element for the tip 17. The condition defined in the functional aspect of feature 1.4 "thereby keeping the sound tube in abutting contact with at least parts of the external surface whereby the external surface imparts the shape of the surface to the sound tube" is met. However, the surface 27 and the tool 36 are not adapted to receive and hold the second connector of a BTE hearing aid. Even if an attachment element according to the patent in suit might be implemented in the form of a gripping element (see paragraphs [0015], [0064], [0065] and Figures 9 to 11), this gripping element must fulfil the requirements of claim 1, i.e. to receive and hold the connector of a BTE hearing aid. In Figure 3 of document D3, the tip is gripped between the bending tool 36 and the surface 27 and thus held but not received in the

attachment element. This means that feature M1.4 is not anticipated by document D3.

As the bending device shown in Figures 1 to 3 does not have attachment elements according to features M1.3 and M1.4, the holder M1.1 is not suitable for shaping a sound tube for a BTE hearing aid, the sound tube having a first end attached to a first connector for coupling the sound tube to the BTE housing and a second end attached to a second connector for coupling the sound tube to an ear piece of the BTE hearing aid. The further argument of appellant II that the connectors were made of a different material and were separate parts overmoulded onto the sound tube is not relevant as these aspects are not reflected in claim 1.

2.4 To conclude, the subject-matter of claim 1 is novel over document D3, Article 54(1) and (2) EPC 1973.

3. Main request - Lack of inventive step

3.1 Starting point

The claimed subject-matter relates to a simplified manufacturing method for providing a sound tube for use in a BTE hearing aid with a pre-formed shape. Thus, it belongs to the technical field of hearing aids and their design and manufacturing methods. Its purpose is to provide a more expedient and cost effective method of producing a sound tube with a pre-formed shape.

Pursuant to the Case Law of the Boards of Appeal (see Case Law of the Boards of Appeal of the European Patent Office, 9th edition, 2019, I.D.3.1 to 3.4), "the closest prior art for assessing inventive step is normally a prior art document disclosing subject-matter

conceived for the same purpose or aiming at the same objective as the claimed invention and having the most relevant technical features in common, i.e. requiring the minimum of structural modifications (see in this chapter I.D.3.2.). In a number of decisions, the boards have explained how to ascertain the closest prior art constituting the easiest route for the skilled person to arrive at the claimed solution or the most promising starting point for an obvious development leading to the claimed invention (see in this chapter I.D.3.4. and I.D.3.5.)".

The closest prior art for the purpose of objectively assessing inventive step is regularly that which corresponds to a similar use requiring the minimum of structural and functional modifications (see e.g. T 606/89, Reasons 2).

In view of these considerations, document D2 constitutes the most promising starting point. It belongs to the same technical field, i.e. it discloses a BTE hearing aid and its manufacturing method (see Figure 1 and page 8, lines 11 to 22). Moreover, it is directed to a similar purpose, i.e. shaping sound tubes for BTE hearing aids.

The board considers D3 a less promising starting point as it has fewer features in common (see item 2.3) and belongs to a different technical field. Although it discloses a method and device for bending a component made of a thermoplastic material (see column 1, lines 12 to 13), it is directed to personal care appliances such as a dental care, a hair care, a kitchen apparatus or the like (see column 1, lines 16 to 18). BTE hearing aids, or even more general sound tubes, are not mentioned in document D3. Sound tubes for BTE hearing

aids are technical devices used over a long time that require special technology and designs to, *inter alia*, improve sound transmission and reduce noise interference. Thus, sound tubes for BTE hearing aids have different requirements in terms of accuracy compared to simple products designed for single use in the field of personal care appliances. It is not apparent that the method and device disclosed in document D3 could be suitable for the purpose of shaping a sound tube for hearing aids.

Document D6 discloses a BTE hearing aid which has a resilient fibre formed by heat forming or UV-light forming. However, it does not mention a method of shaping the sound tube. Its disclosure does not go beyond that of document D2.

As a consequence, document D2 is the most promising starting point for the assessment of inventive step in this case.

3.2 Differentiating features and technical effect

The BTE hearing aid shown in document D2 has a first connector 28 and a second connector 30 (see page 8, lines 12 to 15). It is manufactured by a formed wire positioned within the tube used for bending the tube to the desired shape (see Figure 1 and page 8, lines 11 to 22). Therefore, the wire can be considered a holder according to feature M1.1. The formed wire comprises an external surface as claimed in feature M1.2. However, document D2 does not disclose features M1.3 and M1.4 directed to the first and second attachment elements. The technical effect of the first and second attachment element adapted to receive and hold the first and second connector, respectively, is that the sound tube

can be held in a simpler way.

3.3 Objective technical problem

The objective technical problem is to find a more expedient and cost effective method of producing a sound tube with a pre-formed shape (see paragraph [0009] of the patent in suit).

3.4 Obviousness of the solution

The board does not agree with appellant I that the skilled person would have taken into account document D1 and that this prior art suggested the claimed solution.

Document D1 shows a device for shaping small polymer tubes by squeezing the tubes into a holder, heating and then cooling them (see column 1, lines 3 to 9). The tubes have a diameter in the range of 4 to 20 mm and are used in particular in the automotive sector (see column 1, lines 10 to 13). Document D1 is concerned with the problem of providing a holder for inserting and taking out bent tubes in an easy and efficient manner by avoiding the opening and closing of attachment means (see column 1, lines 54 to 58).

In the judgement of the board, the skilled person would not have considered document D1 when looking for a more expedient and cost effective method of producing a sound tube for BTE hearing aids with a pre-formed shape. Although the application of its disclosure is not restricted to tubes in the automotive sector, no other technical field is mentioned. More importantly, document D1 explicitly teaches away from providing attachment elements (see column 1, lines 54 to 58)

which form a central part of the claimed solution.

Even if the skilled person would have considered document D1, it does not disclose first and second attachment elements adapted to receive and hold the first and second connectors, respectively. Although the patent in suit does not exclude that the sound tube is held in a groove, there is no suggestion of attachment elements corresponding to features M1.3 and M1.4 in document D1. Appellant I explained that flat surface 10 in Figure 1 of document D1 had to be regarded as an attachment element according to feature M1.3 or M1.4. For the reasons provided under item 2.1, the board is of the view that a simple surface, like surface 10 of document D1, is not an attachment element adapted to receive and hold the first and second connectors of a BTE hearing aid.

Consequently, the subject-matter of claim 1 is not rendered obvious by a combination of documents D2 and D1.

3.5 Inventive step in view of documents D6 and D1

Document D6 shows a BTE hearing aid with a sound tube. However, it is silent on how the sound tube is shaped. Since its disclosure is not as close as the teaching of document D2 and in view of the foregoing, a combination of documents D6 and D1 is even less suitable for rendering obvious the subject-matter of claim 1.

3.6 Inventive step in view of document D3 alone

As set out above, the board also considers document D3 a less promising starting point for assessing inventive step than document D2. However, even if the skilled

person would have considered document D3 as a possible starting point, they would not have arrived at the claimed invention. Document D3 does not disclose features M1.1, M1.3 and M1.4 (see item 2.3). These differentiating features have the effect of attaching the connectors of a BTE hearing aid. Contrary to appellant I's opinion, there is nothing in document D3 which could render these features obvious. Although this document mentions a holding device for the shank 12 on one end of a tube, this device is not illustrated in the figures and not explained in any detail (see column 5, line 12 to 13; Figure 1). At the other end of the tube, there is a tip 17 held by tool 36, which bends the component 10 until the tip 17 abuts the engagement surface 27 (see column 5, line 29 to 34). Appellant I argued that the holding device corresponded to the first attachment element while the bending tool 36 together with the surface 27 corresponded to the second attachment element. However, the skilled person would have found no prompt in document D3 on how to adapt or modify these attachment elements for them to be adapted to receive and hold the connectors of a BTE hearing aid. This is particularly true given the lack of details regarding the holding device allegedly corresponding to the first attachment element. Moreover, the arrangement regarded as the second attachment element does not receive the tip but pushes it against engagement surface 27.

Document D3 alone can therefore also not render obvious the subject-matter of claim 1.

3.7 Consequently, the subject-matter of claim 1 is based on an inventive step within the meaning of Article 56 EPC 1973. This conclusion applies equally to the method of

claim 14 which utilises a holder according to claim 1.

4. For these reasons, the grounds for opposition according to Article 100(a) EPC 1973 in conjunction with Articles 54 and 56 EPC 1973 do not prejudice the maintenance of the patent as granted.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is maintained as granted.

The Registrar:

The Chairman:



N. Schneider

P. Lanz

Decision electronically authenticated