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**Datasheet for the decision  
of 2 December 2025**

**Case Number:** T 0084/23 - 3.2.03

**Application Number:** 15837147.6

**Publication Number:** 3240931

**IPC:** E02D7/22

**Language of the proceedings:** EN

**Title of invention:**

METHOD FOR ANCHORING AN OBJECT TO THE GROUND

**Patent Proprietor:**

High Five Solutions B.V.

**Opponents:**

Eurodrill GmbH  
terra infrastructure GmbH

**Headword:**

**Relevant legal provisions:**

EPC Art. 54, 56, 83, 111(1)  
RPBA 2020 Art. 11, 12(3)

**Keyword:**

Novelty - main request (yes) - implicit disclosure (yes/no)  
Inventive step - obvious combination of known features - main  
request (no) - auxiliary request (yes)  
Sufficiency of disclosure - (yes)  
Appeal decision - remittal to the department of first instance  
(no)  
Remittal - special reasons for remittal (no)

**Decisions cited:**

G 0003/14

**Catchword:**



**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

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Case Number: T 0084/23 - 3.2.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.03**  
**of 2 December 2025**

**Appellant:** terra infrastructure GmbH  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
2 November 2022 concerning maintenance of the  
European Patent No. 3240931 in amended form.**

**Composition of the Board:**

**Chairman**            C. Herberhold  
**Members:**            R. Baltanás y Jorge  
                              F. Bostedt

## **Summary of Facts and Submissions**

- I. European patent No. 3 240 931 relates to a "Method for anchoring an object to the ground".
- II. Eurodrill GmbH (opponent 1) and terra infrastructure GmbH (opponent 2) each filed an opposition against the patent, based on Articles 100(c) EPC, 100(b) EPC and 100(a) EPC in conjunction with Articles 54 EPC and 56 EPC.
- III. The present appeal is against the interlocutory decision of the opposition division, which found that the auxiliary request 5 filed during oral proceedings met the requirements of the EPC.

This decision was appealed by opponent 2 (appellant).

Opponent 1 did not file an appeal and was a party as of right in the appeal proceedings.

- IV. In a communication pursuant to Article 15(1) RPBA, the Board indicated its preliminary opinion.
- V. On 18 September 2025, opponent 1 announced that it would not be attending the oral proceedings.
- VI. Oral proceedings were held on 2 December 2025 in the absence of opponent 1; pursuant to Rule 115(2) EPC and Article 15(3) RPBA, opponent 1 was treated as relying solely on its written case.

VII. Requests

The appellant requested that the decision under appeal be set aside and the patent be revoked. The appellant requested that the case be remitted to the opposition division if any auxiliary request were to be treated, and that auxiliary requests E to N not be admitted into the appeal proceedings.

In its written submissions, opponent 1 agreed with the appellant's requests that the decision under appeal be set aside and the patent be revoked, and also with the request that the case be remitted to the opposition division if any auxiliary request were to be treated.

The patent proprietor (respondent) requested that the appeal be dismissed and, in the alternative, that the patent be maintained in amended form on the basis of the claims of one of auxiliary requests A to N.

VIII. Claim 1 as maintained (main request in appeal proceedings; auxiliary request 5 in opposition proceedings), including the numbering of its features as adopted by the parties, reads as follows:

- M1.1** *Method for anchoring an object (15) to the ground with at least one anchor pile that gets inserted into the ground, comprising the steps of:*
- M1.2** *- positioning a sonic drill apparatus at a position where the anchor pile is to be inserted into the ground;*
- M1.3** *- providing an assembly of a head section (6) and one or more rod sections (20), in which the rod sections (20) are connectable to the head section (6) and to each other while extending in*

*a longitudinal direction (x) for forming the anchor pile;*

- M1.4** *- inserting the anchor pile into the ground;*
- M1.5** *wherein the head section (6) comprises a drilling portion,*
- M1.6** *wherein the inserting of the anchor pile into the ground comprises a drilling of the head section (6) with its drilling portion in rotation directly into the ground by means of the sonic drill apparatus (5),*
- M1.7** *repeatedly connecting one of the rod sections (20) thereto and then drilling the connected head and rod sections (6; 20) further into the ground by means of the sonic drill apparatus (5),*
- M1.8** *wherein during at least part of this drilling, a sonic vibration is introduced into the connected sections (6; 20);*
- M1.9** *wherein the provided assembly comprises hollow tube sections as rod sections (6; 20), characterized in that,*
- M1.10** *the head section (6) is closed or substantially closed in a longitudinal direction (x) at its front side;*
- M1.11** *wherein the provided assembly comprises one or more outlet openings (11) in its head section (6) which openings (11) connect to a feed channel inside the hollow tube sections,*
- M1.12** *wherein during at least a final stage of the drilling of the connected sections (6; 20) into the ground, a curable substance is fed pressurized through the feed channel,*
- M1.13** *which curable substance gets injected via the one or more outlet openings (11) into the ground to form a volume (22) of a mixture of the*

*curable substance and ground particles around the head section (6),*

**M1.14** *and wherein the introduced sonic vibration is used during said final stage of the drilling for compacting the mixture of the curable substance and ground particles around the head section (6)*

**M1.15** *after which the curing of the mixture takes place,*

**M1.16** *and after which the object to be anchored to the ground is coupled to a proximal end of the connected sections (6; 20) of the anchor pile.*

Claim 1 of the main request is identical to the granted version of claim 1.

IX. Claim 1 of auxiliary request A is based on claim 1 of the main request, with the addition of the following feature M1.17 at the end of the claim:

**M1.17** *and wherein the head section (6) comprises a hollow tube section (8), and in which the drilling portion of the head section (6) comprises a spiral screw blade (10) along at least part of an outer circumference of the hollow tube section (8)*

X. Prior art

The following documents, which are relevant to this decision, have been cited both in the grounds of appeal and during the opposition proceedings:

D6: WO 2014/049278 A1

D12: EP 1 795 656 A2

D15: Brochure "Neue Wege in der Ankertechnik",  
Friedr. Ischebeck GmbH, W 29/1192/5.93/3 0  
Störring · Druck Ennepetal

The respondent cited the following document, which is relevant to this decision, in its reply to the statement of grounds of appeal:

W3: "Resonance: the science behind the art of sonic drilling", P.A. Lucon, PhD Thesis, Montana State University, 2003 (retrievable at <https://scholarworks.montana.edu>)

XI. The arguments of the appellant and of opponent 1 relevant to this decision can be summarised as follows:

(a) Main request, sufficiency of disclosure

The patent did not disclose how to implement the alternative that involved just one rod section, since feature M1.7 required the rod sections to be **repeatedly** connected. The reasoning of the opposition division in point II.5.2.1 was flawed, since the interpretation of claim 1 suggested by the division contradicted the wording of feature M1.7, which defined "repeatedly connecting one of the rod sections" in a non-optional manner. Furthermore, it was not obvious to the skilled person how the rod sections could be connected once the anchor pile had already been inserted into the ground (feature M1.4).

(b) Main request, novelty and inventive step in view of D15

The subject-matter of claim 1 was not novel over D15.

Even though D15 did not mention sonic vibrations, this feature was implicitly disclosed, since a sonic vibration represented simply a vibration, and any drilling device that applied a vibration had to produce some sound, as was the case in D15. Thus, it was a sonic drill apparatus applying sonic vibrations. Document D15 disclosed in point 5 on page 4 that the vibrating device worked as a concrete vibrator ("Rüttelflasche"), and such devices were known to produce vibrations in the ultrasound frequency range. In any case, the expression "schwingende Bohrstange" on page 4 left no doubt that vibrations were applied during drilling.

Furthermore, any drilling device that applied a regular impulse axially (e.g. pneumatically or hydraulically) resulted in sound being produced - whether or not it was audible to humans -, thus corresponding to a sonic drill apparatus.

Furthermore, the subject-matter of claim 1 of the main request was obvious when starting from D15 and combining it with the teaching of D6, which disclosed the use of sonic vibrations for more effective soil drilling.

It had to be noted that, starting from D15, document D6 was the secondary teaching for the skilled person, and that it was thus not required that all features of claim 1 or of D15 had to be shown there in order to consider that the combination was obvious. The field of application of D6 was not as relevant as the fact that it related to soil drilling and that it showed the benefit of sonic vibrations for this purpose.

The arguments of the respondent relating to the alleged shape of the drilling head of D6 were mere unsubstantiated allegations which could not be retained.

(c) Auxiliary request A, remittal

The case was to be remitted to the opposition division for consideration of auxiliary request A. The appeal proceedings served the purpose of reviewing the decision of the first instance. Since the opposition division had not dealt with the auxiliary requests, this was a special reason justifying the remittal of the case.

(d) Auxiliary request A, inventive step

There was no synergistic effect between the distinguishing features "sonic vibration" and "spiral screw blade". Therefore, an approach based on partial problems was justified, thus treating each distinguishing feature separately. Paragraph [0019] of the patent specification was not credible evidence for an alleged combined effect of the distinguishing features, since the sonic vibration acted in an axial direction whereas the spiral screw blade acted in a radial direction. Consequently, the skilled person would not derive from the patent application or the patent specification that a combined effect could arise.

As was concluded with regard to the main request, the distinguishing feature of "sonic vibration" was obvious when starting from D15 taking into consideration the teaching of D6.

As a first line of attack against the second distinguishing feature, the "spiral screw blade", it was noted that the respondent did not propose any technical effect relating to it. Consequently, this feature was an arbitrary selection or a routine modification that could not justify the presence of an inventive step.

Second, even if the spiral screw blade was accepted to have a positive effect, this effect would be known to the skilled person since spiral screw blades were standard in the technical field.

Taking into account the technical effect of increasing the pulling force in an anchor pile as disclosed in paragraph [0020] of the patent specification, the objective technical problem of how to achieve higher pulling forces would have to be considered. The fact that paragraph [0020] of the patent specification linked the technical effect to certain dimensions was irrelevant, as the skilled person would understand that dimensions were only of secondary importance in this respect.

The obvious solution to this technical problem, as also mentioned in paragraph [0003] of the patent specification, was to use spiral screw blades as disclosed e.g. in D12. Starting from D15, the skilled person would look for a solution to the posed problem and would find the head section comprising the distinguishing feature in document D12 (detail of Figure 3). D12 mentioned as an advantage the fact that larger tensile forces could be withstood by means of a spiral screw blade (see paragraphs [0002] and [0011]), which provided the skilled person with a clear motivation to combine this teaching with D15.

XII. The arguments of the respondent relevant to this decision can be summarised as follows:

(a) Main request, sufficiency of disclosure

The invention of claim 1 was sufficiently disclosed when the claim was interpreted in a technically reasonable manner.

(b) Main request, novelty and inventive step in view of D15

The publication date of D15 was not satisfactorily established during the opposition proceedings.

Furthermore, D15 disclosed 84 possible combinations of anchors (four possibilities), installation methods (three possibilities) and ways of drilling (7 possibilities), thus failing to provide a single disclosure of all features as it would be required for a novelty objection. Consequently, there was no direct and unambiguous disclosure of e.g. a substantially closed head section (feature M1.10) in combination with the rest of the features of claim 1 which could eventually be found in the different embodiments of D15.

Moreover, D15 related to a hammer drill (see the reference to "drehschlagend" on page 10). These devices work by periodically striking the drilling tool in a longitudinal direction. This differed from the general meaning of "vibration", which implied an oscillating movement with a given amplitude. The hammer drill of D15 provided at most some "swinging" as a result of the hammering action but not a vibration according to the

generally acknowledged meaning of the term. This "swinging" was the "vibration" disclosed on page 11 of D15, which did not correspond to a real vibration.

Regarding D15 again, this document did not disclose that the anchor was drilled by rotation into the ground and vibrated simultaneously, since it made a clear distinction between the drilling ("Bohren") and the compression ("Verpressen") steps (see page 10 of D15). "Vibrations" were only applied during the latter step, as disclosed on page 11. The reference to a concrete vibrator in point 5 on page 4 related only to the result obtained, not to the means used to achieve it.

Concerning inventive step, document D6, unlike D15, did not belong to the field of foundation technology, but to that of soil reinforcement (see page 1). For this reason alone, the skilled person would not consider the teaching in D6 to be applicable to the devices of D15. In particular, the application of "umbrella anchors" shown in D6 was not intended to connect any object to the pile, but rather to reinforce the ceiling of a tunnel by interconnecting the soil layers above it and preventing shear stress.

Therefore, the skilled person would not consider D6 when looking for a solution to the objective technical problem of reducing the necessary power for drilling (the consequence of the technical effect mentioned in paragraph [0011] of the patent) starting from D15 since D6 required a cased hole to be made ("drillhole (F)"; see abstract), relied on the use of a flushing fluid ("fluide de forage"; see page 2, line 5), and stated that the entire drill pipe was filled with grout ("coulis de scellement"; see page 2, line 3), which could optionally comprise a metallic bar protruding

from the sealing grout (see page 3, lines 10 to 13). The position of the boring tube of D6 was adjusted after boring (see page 7, lines 27 to 32), something which was not possible for the pile foundations created by the devices of D15.

Moreover, the skilled person would note that according to D6 a flushing liquid was needed to drive the pile into the ground. Thus, using this technique in a device that did not use flushing liquid as in D15 would not be an option likely to succeed.

In any case, the skilled person would understand the teaching of D6 as involving a vibration of the tool, but not necessarily rotating the latter during drilling, since rotation was only described as an option (see page 2, lines 12 to 17, page 2, lines 24 and 25, page 6, lines 17 to 20, 23 to 26, and page 7, lines 24 to 26). Thus, in order to arrive at the invention of claim 1, the skilled person would first have to isolate the vibration aspect and then, as a second step, include the optional rotation aspect, which speaks against the obviousness of the proposed combination of features.

The skilled person would further note that document D6 did not disclose a closed or substantially closed front side within the meaning of the patent. Therefore, the use of sonic vibrations in this documents was not directly applicable to the substantially closed drilling heads of D15. The reference to a tool "*plein face*" in D6 referred to a hollow tube with a flat linear structure and teeth arranged along a diameter of the tube and at its end. This was because an open head was essential for the use of the drilling fluid shown in D6. This was incompatible with the substantially

closed head section within the meaning of claim 1 of the main request.

Furthermore, the anchor pile of D15 was not suitable for accommodating vibratory loads during insertion, as such piles were manufactured as a relatively narrow thin-walled hollow tube (see pages 2, 4 and 5 of D15). The range or r.p.m. shown in D15 were also much lower than the frequencies required by the sonic vibration shown in D6. Thus, the skilled person would be reluctant to use such vibration in D15, as it would require major modifications.

Finally, the skilled person would also be reluctant to vibrate the anchor pile of D15 during insertion because this document disclosed that vibrations densify the soil (see page 11 of D15), which would increase the insertion force required.

(c) Auxiliary request A, remittal

No position was expressed on this point.

(d) Auxiliary request A, inventive step

The subject-matter of claim 1 of auxiliary request A involved an inventive step when starting from D15 even if D6 and D12 were taken into account.

When starting from D15, The skilled person had no incentive to take into consideration the teaching of D12, since they had no reason to believe that the spiral screw blade as shown in D12 was suitable for use with sonic vibrations. D12 only disclosed the use of a spiral screw blade without any kind of vibrations.

Furthermore, the patent disclosed a combined effect of the distinguishing features "sonic vibration" and "spiral screw blade" in paragraph [0019]. This combination improved the mixing and compacting of the injected curable substance and ground particles. The skilled person would not doubt this, since sonic vibrations acted not only in axial direction as alleged by the appellant. Given this combined effect of the sonic vibrations and the spiral screw blade, the partial problem approach proposed by the opponent was not justified.

## **Reasons for the Decision**

1. Main request
- 1.1 Sufficiency of disclosure - Article 83 EPC
  - 1.1.1 No further submissions regarding sufficiency of disclosure were made after the communication under Article 15(1) RPBA. The Board thus maintains its opinion as advanced in the communication.
  - 1.1.2 The appellant argued that the patent did not disclose how to implement the alternative that involved just one rod section, since feature M1.7 required that rod sections be **repeatedly** connected. Furthermore, the appellant brought forward that it was not obvious to the skilled person how the rod sections could be connected once the anchor pile had already been inserted into the ground (feature M1.4).
  - 1.1.3 The objection of the appellant relating to the adverb "repeatedly" is not persuasive. It concerns a lack of

clarity rather than an insufficient disclosure of the patent, and a lack of clarity is not objectionable in opposition appeal proceedings for a granted claim, see G 3/14. The skilled person would immediately recognise the contradiction between "repeatedly connecting one of the rod sections" (feature M1.7) and the embodiment comprising the head section and just one rod section (feature M1.3). They would realise that a "repeated" connection of the rod sections is impossible in this context and that this feature only applies to the alternative "**or more** rod sections" in feature M1.3. They would also be aware that the number of rod sections depends on the depth to be reached (see paragraph [0004] of the patent specification). Thus, the skilled person would understand the correct meaning of the claim in the light of their common general knowledge: it is impossible to make a "repeated" connection when using just one rod section.

- 1.1.4 The argument related to the alleged problem of how to connect a rod section once the anchor pile has been inserted into the ground is also not persuasive. First, feature M1.4 does not define a complete insertion of the anchor pile into the ground, but rather the act of inserting the anchor pile to an undefined extent. Second, the skilled person knows from their common general knowledge that a connection cannot be established when the parts to be connected are inaccessible, and would thus automatically reject such an understanding of feature M1.4. Third, the patent discloses how to establish a connection between the head section and/or the rod sections once the anchor pile has been inserted as defined in feature M1.4 (see paragraph [0043]). Finally, the respondent is correct in stating that the step of "connecting" in feature M1.7 forms part of the insertion step defined in

feature M1.4. Thus, the alleged problem is rather related to an incorrect interpretation of claim 1.

1.1.5 In view of the above, the invention defined in claim 1 of the main request is sufficiently disclosed (Article 83 EPC).

1.2 Document D15, Novelty - Article 54(2) EPC

1.2.1 Public availability of D15

The opposition division decided that document D15 constituted prior art within the meaning of Article 54(2) EPC, providing a detailed reasoning (see point II.6.1 of the contested decision).

The respondent did not contest this reasoning in a substantiated manner during the appeal proceedings. A brief statement in the respondent's written submissions regarding the allegedly not established publication date of D15 does not suffice in this respect (see reply to the appeal dated 13 July 2023, point 4.2), since it does not explain why the reasons given in the contested decision are considered to be incorrect.

Therefore, the allegation was not substantiated within the meaning of Article 12(3) RPBA, and this issue was not to be considered in the appeal proceedings.

1.2.2 Different embodiments in D15

The respondent argued in writing that D15 disclosed 84 possible combinations of anchors (four possibilities: See page 3 of D15), installation methods (three possibilities: Vertical, sloping and horizontal) and ways of drilling (seven possibilities: See page 9).

This meant that a single disclosure of all features, as required for a novelty objection, was not provided.

This is not persuasive.

First, claim 1 is not restricted to a particular installation method (i.e. vertical, sloping or horizontal) for the drilling device.

Second, D15 discloses a "new method" in the anchoring technique (i.e. the principle behind the TITAN drilling and injection anchor, see page 2 of D15) (features M1.1 and M1.4), which is applicable to all head sections and applications disclosed in the document. This method includes the final compression stage ("Verpressen"), which is disclosed on page 11 (see also point 3 on page 4 of D15), and involves injecting a curable substance while the device is rotated (features M1.12 and M1.13).

Thus, the question is whether using the method for anchoring an object (feature M1.16; see also the applications on page 3) as disclosed on page 11 of D15, when working with the head section substantially closed in a longitudinal direction (features M1.5 and M1.10) provided with outlet openings (feature M1.11) for feeding a pressurised curable substance (features M1.13 and M1.15) connected (feature M1.3) to hollow tubes as rod sections (feature M1.9) as disclosed on page 9 (see e.g. third device from the top, comprising outlet openings as in the example of Figures 6a and 6b of the contested patent), results in a method comprising all the features of claim 1.

- 1.2.3 Sonic drill apparatus (features M1.2, M1.6 and M1.7) and sonic vibration (features M1.8 and M1.14)

The appellant and opponent 1 acknowledged that D15 did not explicitly mention sonic vibrations, but argued that this feature was implicitly disclosed, since a sonic vibration represented simply a vibration, and given the fact that any drilling device that applied a vibration had to produce some sound (be it audible to humans or not), including the devices of D15. The D15 drilling devices thus qualified as a sonic drill apparatus applying sonic vibrations.

This is not persuasive, since "sonic drilling" is a generally recognised concept in the technical field of soil drilling and it involves applying specific (adjustable) frequencies to the drilling device to create resonance, which optimises drilling performance (see e.g. W3, second to fourth paragraphs of page 3, pages 6 to 9, and first paragraph of page 39, or D6, page 8, lines 18 to 25). The skilled person would know that not all vibrations applied to a drilling device result in "sonic drilling", a method which, at the time, represented an improvement on previous perforation methods used in soil drilling.

As the appellant acknowledged, D15 makes no mention of the type of vibrations applied; the reference to a concrete vibrator in point 5 on page 4 only concerns the **effect** produced by the vibrating drilling tool. Therefore, it cannot be considered that the drilling device of D15 is directly and unambiguously disclosed as a sonic drilling apparatus that applies a sonic vibration.

Consequently, even though other aspects of features M1.2 (positioning a drilling apparatus at a position where the anchor pile is to be inserted into the ground: Implicit; see also pictures on page 7), M1.6

(the inserting of the anchor pile into the ground comprises a drilling of the head section with its drilling portion in rotation directly into the ground by means of the drill apparatus: See arrows on the left side of page 9), M1.7 (repeatedly connecting one of the rod sections thereto and then drilling the connected head and rod sections further into the ground by means of the sonic drill apparatus: See page 9, third and fifth example from the top), M1.8 (see next point) and M1.14 (the introduced vibration is used during said final stage of the drilling for compacting the mixture of the curable substance and ground particles around the head section: See point 5 on page 4, and also the word "*Vibration*" on page 11) are disclosed in D15, no sonic drill apparatus producing sonic vibrations is disclosed therein.

- 1.2.4 Feature M1.8 (during at least part of this drilling, a sonic vibration is introduced into the connected sections)

The respondent argued that D15 did not disclose that the anchor was drilled into the ground and vibrated simultaneously, since this document made a clear distinction between the drilling ("*Bohren*") and the compression ("*Verpressen*") steps (see page 10 of D15), with vibrations only being applied during the latter, as disclosed on page 11. Document D15 related to a hammer drill (see reference to "*drehschlagend*" on page 10) working by periodically striking the drilling tool in a longitudinal direction while drilling. This differed from the general meaning of "*vibration*", which implied an oscillating movement with a given amplitude. The hammer drill of D15 provided at most some "*swinging*" during drilling as a result of the hammering action but not a vibration according to the generally

acknowledged meaning of the term. According to the respondent, the reference to a concrete vibrator in point 5 on page 4 related only to the result obtained and not to the means used to achieve it.

This is not persuasive.

Even though the Board considers that no sonic vibration is disclosed in D15 (see the preceding point 1.2.3), this document shows in point 5 on page 4 that a vibration is applied during drilling ("**...schwingende Bohrstange beim Bohren** und Verpressen..."; emphasis added). The disclosures on pages 9 and 11 do not contradict this.

The respondent acknowledged that the alleged periodic striking of the drilling tool produced at least some "swinging". The skilled person would understand that such "swinging" - which would necessarily be as periodic as the alleged striking - corresponds to a vibration with a given amplitude and frequency, even if both parameters of the resulting vibration might be very different from those corresponding to a sonic vibration.

Therefore, the only aspect of feature M1.8 that is not disclosed in D15 is that the vibration is a "**sonic** vibration".

#### 1.2.5 Conclusion

The subject-matter of claim 1 differs from D15 in features M1.2, M1.6, M1.7, M1.8 and M1.14 with regard to the "sonic vibration" aspect.

#### 1.3 Inventive step starting from D15 - Article 56 EPC

1.3.1 Distinguishing features, technical effect and objective technical problem

As the respondent argued, the technical effect of the distinguishing features with respect to the "sonic vibration" aspect (see points 1.2.3 and 1.2.4 above) is that less power is required for drilling, as disclosed in paragraph [0011] of the patent specification (see column 3, lines 47 to 50).

The related objective technical problem can thus be formulated as how to reduce the necessary power for drilling.

This is undisputed.

1.3.2 Obviousness in view of D6

The arguments of the respondent regarding obviousness, which largely correspond to those of the opposition division, are not convincing for the following reasons.

The skilled person would consult D6 when seeking to reduce the necessary power for drilling starting from D15, because D6 relates to drill pipes that inject grout. In this context, it is irrelevant whether or not the applications of the pile created by D6 (e.g. "umbrella anchors" provided in tunnel roofs) are identical to those of the pile created by D15, or whether the pile can still be lifted at the end of the drilling operation. The skilled person would consult D6 because it deals with the general concept of drilling a hole of comparable dimensions into the soil using comparable tools.

The respondent argued that D6 required the use of a flushing liquid. While this is correct, the alleged difference between D15 and D6 in the use of a flushing fluid to evacuate the loosened ground (see page 7, lines 1 to 6 of D6) is irrelevant to the question of how to reduce the necessary power for drilling (i.e. the objective technical problem). D6 does not suggest that the flushing fluid plays any role in this respect, and the respondent's arguments relating to the alleged advantage of the **flushing** fluid in softening the ground are unsubstantiated. In any case, D15 discloses drilling tools with a substantially closed distal end (see e.g. page 9, third drill head from above), which are suitable for using a flushing fluid in amounts comparable to those required for the embodiment with a substantially closed head in D6 (see the arrows indicating the movement of fluid in D15, page 9; "outil pleine face", D6, page 3, lines 3 to 5, see the corresponding discussion below). Consequently, even if the skilled person considered that D6 required sonic vibration to be used in combination with a flushing fluid, they would have no difficulty in implementing both features simultaneously in D15. Therefore, this alleged difference does not justify that the skilled person would disregard D6 nor that they would consider the solution based on sonic vibrations as being technically incompatible with D15.

Concerning the arguments of the respondent and the opposition division about an alleged difference in the dimensions of the drilling tools of D6 and D15, D6 does indeed disclose a drilling method involving the use of a flushing liquid (see page 3, lines 6 and 7) wherein the drill pipe is filled with sealing grout (see page 3, lines 14 to 21). However, it provides no information on the dimensions of the head section (12a, 14, 16) and

its attached rod sections (12b, 12c). In fact, D6 discloses that the head section (12a, 14, 16) and rod sections (12b, 12c) remain in the drilled hole (see page 7, line 27 to page 8, line 2; the final adjustment of the drilling tool is irrelevant in this respect), as it is also the case in D15, where grout is also injected through the drilling pipe (see figure on page 11 of D15). Therefore, the skilled person would have no reason to believe that the dimensions of the drilling pipe of D6 are substantially different to those of the drilling pipe of D15. This alleged difference cannot therefore justify a technical prejudice against the use of sonic vibrations in D15.

The skilled person would learn from D6 that using sonic vibrations increases the drilling/insertion speed (see page 6, lines 23 to 26 and page 8, lines 15 to 25) and that this is done in combination with the rotation of the drilling pipe (see page 2, lines 12 to 18, and also page 6, lines 17 to 20). Contrary to the respondent's argument, D6 explicitly discloses the combination of sonic vibration and rotation (see page 6, lines 17 to 26). The sentence "***De préférence, pendant le forage, on fait également tourner le tube de forage***" (emphasis added) in lines 15 and 16 on page 2 does not imply that the skilled person would have to make two choices in order to arrive at the combination of sonic vibrations and rotation; instead it merely introduces a new embodiment comprising both features. It is further noted that the passage in lines 24 to 26 of page 7 of D6, which was cited by the respondent, relates to the injection of grout after drilling has finished, rather than to the drilling step itself.

The skilled person would apply the teaching of D6 combining sonic vibration and rotation to address the

objective technical problem in the method of D15, which is particularly compatible with D6 given that they have a similar construction - namely, a drilling pipe comprising a head section configured to inject grout.

According to the respondent, the skilled person would be discouraged from applying the teaching of D6 to D15 due to the different construction of the drilling head, which in the case of D6 was allegedly open.

This is not persuasive since, even though the "*élément de coupe diamétral*" described from line 31 of page 2 to line 2 of page 3 might correspond to a flat linear structure provided with teeth arranged along a diameter of the tube as suggested by the respondent, D6 immediately afterwards describes in a direct and unambiguous manner that "*L'élément de coupe diamétral peut être étendu de sorte que l'outil de coupe est un outil « pleine face » comportant au moins une perforation*" (translation by the Board: "The diametrical cutting element can be extended so that the cutting tool is a 'full face' tool comprising at least one perforation"). This is precisely the type of device disclosed in D15 (see e.g. third device from the top on page 9) (see also the embodiment of Figures 6a and 6b of the contested patent, for comparison). The skilled person would thus be aware that such a substantially closed head section is suitable for use with sonic vibrations.

The arguments of the respondent about an alleged difference in the thickness of the drilling tube between D15 and D6 are mere unsubstantiated allegations which do not justify any technical incompatibility of the drilling tools of D15 with respect to sonic vibrations. Neither D6 nor D15 makes any reference to

wall thickness, and the figures in both documents are merely schematic, so that no conclusions can be drawn from them in this respect.

The fact that the range of r.p.m. disclosed in D15 is far removed from the frequencies used when applying sonic vibrations does not imply any technical incompatibility of the device of D15 operating under such vibrations, since the document does not exclude the use of any particular range of frequencies. The alleged need of major modifications to enable such use is thus another mere unsubstantiated allegation.

Finally, the respondent argued in writing that the skilled person would be reluctant to vibrate the anchor pile of D15 during insertion, since this document disclosed that vibrations densified the soil (see page 11 of D15), which would increase the force required for insertion. This corresponds to the "technical prejudice" referred to in the contested decision in the context of combining it with common general knowledge (see point II.8.2.2.1 of the decision).

However, this is not persuasive. D6 explicitly states that sonic vibration is advantageous for drilling into the ground (see page 6, lines 23 to 26 and page 8, lines 15 to 25). When consulting D6, the skilled person would accept this teaching, particularly since the references to vibrations in D15, referred to by the opposition division and the respondent, actually relate to the densification of the grout after drilling is completed, rather than to the densification of the ground to be perforated. D15 discloses in point 5 on page 4 that the vibrations have the same effect as a concrete vibrator **in the concrete** ("*...wie eine Rüttelfalshche in Beton...*"), but not in the ground

being drilled. It is in this context that the disclosure of page 11 ("*Vibration leistet Verdichtungsarbeit*") is understood by the skilled person.

### 1.3.3 Secondary indicia

The respondent argued in writing that the presence of an inventive step was justified by secondary indicia, such as the alleged commercial success of the invention and the fact that nobody apparently thought about it despite D15 having been available for several years.

Since the invention was obvious in the light of the combination of D15 and D6 (see point 1.3.2 above), no "secondary indicia" can compensate for this.

### 1.3.4 Conclusion

In view of the above, the subject-matter of claim 1 of the main request does not involve an inventive step with regard to the combination of D15 with D6 (Article 56 EPC).

## 2. Auxiliary request A

### 2.1 Request for remittal - Articles 111(1) EPC and 11 RPBA

The appellant requested that the case be remitted to the opposition division to treat auxiliary request A. The appellant argued that the appeal proceedings served the purpose of reviewing the decision of the first instance and that, since the opposition division had not dealt with the auxiliary requests, this constituted a special reason to remit the case.

The Board does not agree. It should be noted that reviewing the decision under appeal is the primary object of the appeal proceedings (see Article 12(2) RPBA), but it is not the only one. In the present case, the framework of the discussion remains the same relating to the auxiliary requests (see point 2.2 below). It is common practice for the Boards of Appeal to deal with auxiliary requests that were not the subject of the appealed decision, and the mere fact that a request has not been dealt with in the decision under appeal does not qualify as a special reason for remittal within the meaning of Article 11 RPBA.

The Board thus exercised its discretionary power under Article 111(1), second sentence, EPC and did not remit the case to the opposition division.

2.2 Inventive step starting from D15 - Article 56 EPC

2.2.1 Technical effect and objective technical problem

It is uncontested that the added feature M1.17 (*"wherein the head section comprises a hollow tube section, and in which the drilling portion of the head section comprises a spiral screw blade along at least part of an outer circumference of the hollow tube section"*) is not anticipated by D15.

Thus the subject-matter of claim 1 differs from D15 by features M1.2, M1.6, M1.7, M1.8 and M1.14 with regard to the "sonic vibration" aspect (see points 1.2.3 and 1.2.4 above) and also by feature M1.17 ("spiral screw blade").

The appellant argued that no common effect between the distinguishing features "sonic vibration" and "spiral

screw blade" could be acknowledged in view of the different direction of the mechanical effect involved by each of them. They also argued that either the screw blades *per se* were without effect during drilling, in which case they could not justify an inventive step, or they had a positive effect for drilling, and then this effect was known and obvious to the skilled person.

This is not persuasive.

Paragraph [0019] of the patent specification discloses that the combination of a spiral screw blade with sonic vibrations "*advantageously may help to further improve the mixing and compacting of the injected curable substance and ground particles.*"

The skilled person would have had no reason to question this technical effect. No considerations about the implications of the directions of vibration and of extension of the spiral screw blade are derivable from this passage or from the common general knowledge of the skilled person. The arguments of the appellant about two incompatible working directions are mere unsubstantiated allegations. This is particularly the case since sonic vibrations will inevitably spread to some extent in directions other than the pure axial direction. Furthermore, at least the radial surfaces of the spiral screw blade will work on the surrounding mixture of grout and ground even if they are vibrated axially.

The Board thus considers that the sonic vibrations and the spiral screw blade have a combined effect, leading to the objective technical problem of how to improve the mixing and compacting of the injected curable substance and ground particles in D15.

Since the appellant has failed to demonstrate that D12 addresses this technical problem, the objection fails already for this reason alone. The skilled person would not be motivated to consult two documents (D6 and D12) to solve a single technical problem, particularly when neither of them addresses the posed technical problem or mentions the combined technical effect of the distinguishing features.

The approach based on partial problems relating to each of the distinguishing features individually (the second partial problem being an arbitrary selection or a routine modification or may be formulated as how to achieve higher pulling forces) is not appropriate for the present case. It cannot be applied in view of the combined technical effect of the distinguishing features, which are more than a mere aggregation of features.

Consequently, the appellant's arguments regarding the alleged obviousness of the second distinguishing feature in view of the teaching of D12 - which discloses the use of a spiral screw blade for withstanding larger tensile forces - and the respondent's counterarguments concerning the lack of suitability of the spiral screw blade of D12 for use in combination with sonic vibrations need not be addressed in this decision.

### 2.3 Adapted description

The opponent had no objection to the adapted version of the description submitted during oral proceedings before the Board. The Board does not have any objection in this respect either.

## **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 amended form in the following version:

#### Claims:

No. 1 to 8 according to auxiliary request A filed on 13 July 2023

#### Description:

Paragraphs [0019] and [0030] filed at the oral proceedings before the Board

Paragraphs [0001] to [0018], [0020] to [0029] and [0031] to [0057] of the patent specification

#### Drawings:

of the patent specification

The Registrar:

The Chairman:



C. Spira

C. Herberhold

Decision electronically authenticated