Düsseldorf Higher Regional Court, 2 U 14/19

Justiz NRW
Rechtsprechungsdatenbank ONLINE

Machine translation

Date:	10.08.2023
Court:	Düsseldorf Higher Regional Court
Panel:	2nd civil senate
Decision type:	Judgment
File number:	2 U 14/19
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Previous instance: Düsseldorf Regional Court, 4c O 76/17

Guiding principles:

1. If it is not possible to prove directly that the device is equipped with a certain feature (here: adjustable attenuator), the proof can also be furnished indirectly by showing the corresponding function for the challenged embodiment (or if this is undisputed) and by eliminating any possible substitute cause of function as that of the use of the invention.

2. It is necessary for the plaintiff to show - firstly - that only a conclusive number of constructive possibilities is conceivable for the technical function in question and - secondly - that he excludes each of these alternative possibilities for the challenged embodiment with certainty.

3. If the expert has therefore not been able to identify a certain design feature (e.g. an adjustable signal damping element required by the patent) in the challenged embodiment and has pointed out that the technical function in question can also be achieved in another way (e.g. by combining a constant signal damping element with a variable amplifier), the allegation of infringement cannot be justified by the fact that the block diagram known for the challenged embodiment does not offer any points for such an alternative solution (constant damper & variable amplifier). cannot be conclusively justified by the fact that the block diagram known

for the challenged embodiment offers no indications for such an alternative solution (constant attenuator & variable amplifier). Even if this should be the case, the conclusion from the function to a specific design is only valid if it is simultaneously claimed that there is no other alternative implementation possibility that could instead explain the function of the challenged embodiment.

4. Even if the defendant prevails in the legal dispute, he may be ordered to pay the costs of an objectively useless expert assessment which he caused to be carried out by his untruthful factual submissions on the alleged equipment and/or functioning of the contested embodiment (Section 96 ZPO).

Tenor:

I. On appeal, the judgment of the 4c Civil Chamber of the Düsseldorf Regional Court pronounced on February 14, 2019 is amended.

The action is dismissed.

II. The costs of the legal dispute (of both instances) are ordered to be borne by the plaintiff. However, the defendant shall first bear the costs of the taking of evidence insofar as they were incurred in connection with the second and third supplementary opinions of the expert.

III. The judgment shall be provisionally enforceable.

The parties may avert enforcement by providing security in the amount of 120% of the enforceable amount for the opposing party, unless the enforcing party provides security in the amount of 120% of the enforceable amount prior to enforcement.

IV. The appeal is not admitted.

V. The amount in dispute is set at € 5,000,000.

G r o u n d s :

I.

The applicant is the registered proprietor of the German part of the European patent X XXX XXX, which - claiming a German priority of Jan. 22, 1999 - was filed on Jan. 20, 2000, and whose grant was published on Dec. 22, 2004. The term of protection of the patent in suit expired on Jan. 20, 2020 - during the appeal proceedings. An action for nullity filed by the defendant was dismissed as unfounded by the Federal Patent Court in its judgment of Oct. 9, 2019 (BPatG judgment) (5 Ni 6/17 (EP)). The defendant's appeal against this decision was unsuccessful before the Federal Court of Justice (BGH decision of January 20, 2022 - X ZR 20/20).

The patent-in-suit relates to a device for adjusting the gain of a repeater. Claim 1 reads as follows in German procedural language:

Device for setting the gain of a repeater (1) having a downlink path (6) and an uplink path (7), preferably a mobile repeater, having an automatic level control (18, 19, 20) which simultaneously reduces the gain in the downlink path (6) and in the uplink path (7) when a setpoint level (Sp) in the downlink path (6) is exceeded,

characterized by

a detector (19) forming a control loop together with a control amplifier (20) and with a first attenuator (18) arranged in the downlink path (6),
which receives an output signal (Sv) generated in the downlink path (6) and monitors its level, a manipulated variable (SG) generated by the control amplifier (20) being fed simultaneously to the first attenuator (18) and to a processing device (21, 23, 24), which sets a second attenuator (22) arranged in the uplink path (7) by means of a control signal (ST) in such a way that the gain in the uplink path (7) corresponds to the gain in the downlink path (6)

The following Figure 1 of the patent application shows a preferred embodiment of the invention.

According to the undisputed findings of the District Court, the defendant's product range includes repeaters for use in railroad and metro lines as well as associated stations and operations centers. The D-1 series (contested embodiment) concerns repeaters for stationary use with a fiber optic connection as well as those for mobile use.

The plaintiff is of the opinion that the repeaters in question literally make use of the technical teaching of the patent in suit, which is why it is suing the defendant for injunctive relief, disclosure, invoicing, recall, removal from the distribution channels, destruction and a declaration of its liability for damages. In support of its allegation of infringement, the plaintiff relies on the results of inspection proceedings initiated by it in the run-up to the legal dispute (Düsseldorf Regional Court, 4c O 22/16), in which patent attorney Dipl.-Ing. S, as court-appointed expert, provided a written expert opinion (GutA, Annex K 12) dated December 2, 2016.

In the contested judgment, the Regional Court largely upheld the action - namely apart from claims for information, accounting and damages for the period from January 22, 2005 to December 31, 2008 - and found against the defendant as follows:

I. The defendant is ordered to cease and desist from selling in the Federal Republic of Germany 12

devices for adjusting the amplification of a repeater with a downlink path and an 13

uplink path, preferably a mobile repeater, with an automatic level control which simultaneously reduces the amplification in the downlink path and in the uplink path when a target level in the downlink path is exceeded.

To offer, place on the market or use, or to import or possess for the aforementioned purposes, if they have the following features: 14

a control amplifier together with a first attenuator in the downlink path 15
a detector forming a control loop together with a control amplifier and with a first attenuator arranged in the downlink path, which detector receives an output signal generated in the downlink path and monitors its level, wherein a manipulated variable generated by the control amplifier is simultaneously supplied to the first attenuator and to a processing device which adjusts a second attenuator arranged in the uplink path by means of a control signal in such a way that the gain in the uplink path corresponds to the gain in the downlink path.

II. for each case of violation of the prohibition according to item I., the 16
Defendant is threatened with a fine of up to EUR 250,000.00, in lieu of which it may be held in custody, or with imprisonment for up to 6 months, with the imprisonment to be served on its managing director.

III. it is hereby determined that the defendant is obligated to compensate the plaintiff 17

for all damage which the plaintiff has incurred since January 1, 2009 as a result of the actions pursuant to Item I. and will continue to do so in the future.

IV. The defendant is ordered to submit to the plaintiff - broken down by calendar quarter- 18

in writing and in an orderly form about the extent to which it has committed the acts referred to under I. since January 1, 2009, stating the following information Indication

a) of the individual deliveries (with presentation of the invoices and alternatively 19
delivery bills) with

aa) Delivery quantities, times and prices, 20

bb) trademarks of the respective products as well as all identification features, such as 21
Type designation, article designation, consecutive product number,

cc) the names and addresses of the commercial customers 22

b) of the individual offers (under presentation of written offers) with 23

aa) Offer quantities, times and prices, 24

bb) trademarks of the respective products as well as all identification features, such as 25
Type designation, article designation, consecutive product number, 26

cc) the names and addresses of the commercial offerees,

c) the prime costs broken down by the individual factors and the profit generated, 27

d) the names and addresses of manufacturers, suppliers and other previous owners, 28
each with the number of products manufactured, received or ordered,

whereby the defendant reserves the right to disclose the names and addresses of the non- 29
commercial purchasers and offerees instead of the plaintiff to a certified public accountant domiciled in the Federal Republic of Germany, to be designated by the plaintiff and bound to secrecy vis-à-vis the plaintiff, provided that the defendant bears the costs and authorizes him to inform the plaintiff upon specific request whether a certain purchaser or offeree is included in the list.

V. The defendant is ordered to surrender the repeaters in its direct or indirect possession 30
as described in to a bailiff to be appointed by the plaintiff for the purpose of destruction at the defendant's expense.

VI. The defendant is ordered to remove the products referred to under I., which are in 31
the possession of third parties, from the distribution channels of the

a) to recall the products by seriously requesting those third parties who have been 32
granted possession of the products by or with the consent of the Defendant's consent, are earnestly requested to return the Products to Defendant and, if the Products are returned, the third parties are promised a refund of the purchase price already paid, if any, and payment of the costs of the recall; and

b) to remove them permanently by the defendant taking possession of these products or 33
arranging for the destruction of the same at the respective owner.

VII. In all other respects, the action is dismissed. 34

VIII. Orders the defendant to pay 90% of the costs and the plaintiff to pay 35
10% of the costs to the plaintiff.

The defendant's appeal is directed against this, with which it continues to pursue its claim 36
for (complete) dismissal of the action, which was unsuccessful in the first instance.

It claims that the signal strength in the downlink path is continuously controlled and that the 37
AGC (Automatic Gain Control) used in the mobile repeaters also allows the signal strength adjustment in the uplink path to be set with a time offset, which contradicts the technical instruction of the patent in suit to reduce the signal gain (only) when a target level is exceeded in the downlink path, and simultaneously in the uplink path as well. The mobile repeaters are not equipped with an AAM module. They do not have a control loop in the patent sense.

With regard to the stationary repeaters, it finally claims that these are indeed equipped with an 38
AAM module, but not - as initially argued in the legal dispute - with an AGC in the downlink path, so that the control signal (manipulated variable) generated in the control loop of the downlink path is not fed to the processing device. The control signals in the downlink path and in the uplink path are independent of each other; there is no link branching as required by the nullity judgment of the -federal patent court.

Finally, the defendant also disputed that the stationary repeaters are at all capable of creating transparency in the communications system.

In view of the expiry of the patent in suit in the meantime, the parties have declared the claim for injunctive relief to be settled on the merits by mutual agreement and with reciprocal applications for costs. With the consent of the defendant, the plaintiff also withdrew its action to the extent that the district court (operative part VI.b) ordered the removal of the infringing items from the distribution channels. 39

In all other respects, the defendant requests 40

that the judgment of the Regional Court be amended and the action dismissed in its entirety. 41

The plaintiff requests, 42

that the appeal be dismissed. 43

It counters the defendant's arguments in detail and defends the judgment of the district court as correct. judgment of the Regional Court as correct. With regard to the stationary repeaters, the realization of the characteristic features with regard to the distinguishing features results from the AAM module, referring in this respect to Exhibit GA-22-6 and the block diagram therein. The mobile repeaters do not have an AAM module. The challenged devices are nevertheless patentable. The use of the claim features concerning the control circuit follows technically compellingly from the undisputed use of an AGC as well as from the award documents of E and the attachment K 11. At least an equivalent infringement is present. 44

For details of the facts and the content of the dispute, reference is made to the contents of the court file and the annexes thereto. 45

The Senate has obtained supplementary expert opinions from the patent attorney Dipl.-Ing. S, which he submitted on November 9, 2020 (ErgGutA I), November 1, 2021 (ErgGutA II) and April 28, 2023 (ErgGutA III). In addition, the Senate heard the expert orally at the hearing on July 25, 2023 (see minutes of the hearing of the same date; AnhProt.). 46

II. 47

The admissible appeal is successful on the merits. 48

According to the results of the appeal proceedings, it cannot be established that the repeaters of the of the D-1 series make use of the technical teaching of the patent in suit. Therefore, the plaintiff is not entitled to the claims asserted in the action. 49

1. 50

The patent in suit relates to a device for adjusting the gain of a repeater. 51

a) 52

Repeaters are used primarily in the mobile communications sector to amplify communications signals that are between a stationary base station and a mobile network terminal (mobile radio), thereby extending the range of the signal, if it could not otherwise be received by the intended communication subscriber (e.g., a particular mobile radio device) due to high signal attenuation. The repeater picks up wireless signals from one of the two communication subscribers (e.g., the base station), amplifies them, and then retransmits them to the other communication subscriber 53

(e.g., a mobile device). The communication path between the base station and the mobile device runs in both directions. In the so-called downlink path, the signals received from the base station are amplified and forwarded to the or each mobile station to be supplied, while the so-called uplink path - vice versa - serves to forward the amplified signals coming from a mobile station to the base station (BPatG judgment p. 8 with reference to paragraph [0014] of the patent application; BGH judgment, p. 4 para. 6, p. 7 para. 12). Usually, the repeater does not add any information to the signals it receives, but forwards the communication signals with the same (original) information content to the mobile or base station.

For the radio link between the base station and the cell phone, the signal amplifier (repeater) should should remain invisible (transparency). This is usually achieved by setting the downlink path and the uplink path to the same signal gain at all times. 54

To prevent overloading of the amplifiers and to avoid exceeding a maximum level, protective circuits are provided in the amplifiers or level, protection circuits are provided in the amplifiers or amplifier paths of the repeater which automatically regulate the output signal back to a maximum value below the threshold value triggering the regulation in the event of an overload by reducing the effective gain of the output signal. Such protection circuits are known as automatic level control (ALC). 55

Repeaters used in mobile means of transportation (such as railroad trains) have the special feature that the path attenuation of the communications signal transmitted between the base station and the mobile station changes constantly as a result of the repeater's movement. If an overload occurs in the downlink path, the level control in the downlink becomes active, which reduces the signal gain leading to the level overload accordingly - as described. The disadvantage of this is that the previously still existing balance of the signal amplification in both directions (downlink and uplink) is disturbed in such a case and the desired transparency (invisibility of the signal amplification) is lost. 56

Therefore, the patent in suit is intended to provide a device for (in particular mobile) repeaters with which the signal amplification can be adjusted in both transmission directions as best as possible (cf. paragraph [0005]; BGH judgment p. 5, para. 9). 57

b) 58

To solve this task, claim 1 of the patent in suit proposes the combination of the following technical features (cf. BGH judgment, pages 6-7): 59

- 1.Device for adjusting the gain of a repeater (1) which has a downlink 6061 path (6) and an uplink path (7).
- 62

- 2. automatic level control (18, 19, 20) is provided.
    - 3. The device 63

a) simultaneously reduces the gain in the downlink path (6) and in the uplink path (7) when a target level (Sp) is exceeded in the downlink path (6), 64

b) comprises 65

aa) a detector (19) which, together with a control amplifier (20) and a first attenuator (18) arranged in the downlink path (6), forms a control loop, 66

bb) a processing device (21, 23, 24), and 67

cc) a second attenuator (22) arranged in the uplink path (7) 68

- 4. the detector (19) receives an output signal (Sv) generated in the downlink path (6) and monitors its level. 6970

- 5. The control amplifier (20) generates a manipulated variable (SG), which is simultaneously fed to both the first attenuator (18) in the downlink path (6) and the processing device (21, 23, 24) simultaneously. 71

- 6. The processing device (21, 23, 24) 72

a) sets, by means of a control signal (ST), the second attenuator (22) in the uplink path (7), 73

b) in such a way that the gain in the uplink path (7) corresponds to the gain in the downlink path (6). 74

c) 75

Even if the invention is primarily dedicated to signal amplification in mobile repeaters, the patent in suit is not limited to this the patent in suit is not limited to this, but also covers stationary repeaters (BGH judgment, p. 7, para. 13). 76

Features (2) and (3a) first describe in general terms the operation of an automatic level control. automatic level control in that the actual values of the communication signal transmitted by the base station are continuously detected in the downlink path and measured against a preset setpoint value. If the monitored actual level value in the downlink path exceeds the setpoint value, the signal gain is reduced not only in the monitored downlink path, but also equally - and simultaneously - in the uplink path. 77

The details of how this is to be achieved in terms of the circuitry are dealt with in the features (3b) to (6): 78

<u>aa)</u> 79

As far as the downlink path is concerned, it is envisaged that an output signal is generated in it whose level is monitored for exceeding the maximum setpoint (feature 4). The signal 80

used for control cannot be the original communication signal sent in the downlink path from the base station in the direction of the mobile radio, but must be a different signal that has been processed (e.g., converted) in some way (GutA p. 13).

(1) 81

The patent in suit is neither limited to an AGC (Automatic Gain Control) nor to an ALC (Automatic Level Control), nor is one of the two constructions excluded. Both are not mentioned in the patent claim; the wording of the claim is rather - purely result-oriented - only directed to the fact that the signal amplification is automatically reduced in case of an inadmissibly high level. Accordingly, the patent claim covers any control (however it may be implemented constructively) which, as a result of an actual-value/target-value comparison, causes the signal amplification initiated by the repeater to be reduced to a lower signal strength (harmless to the communication network) when a signal target value in the downlink path is exceeded and, at the same time, the uplink path is also readjusted accordingly for transparency reasons. For this purpose of the invention, it is irrelevant whether an ALC or an AGC is used. 82

(2) 83

Signal monitoring in accordance with the patent also occurs when corrective action is taken not only singularly when the preset limit value is exceeded, but when the signal gain is continuously influenced by amplifying the communication signal by a higher level when a low-level input signal is present, while the signal gain is correspondingly lower when a high-level input signal is present. Even with this type of continuous signal strength adjustment, a threshold value is of course observed which must not be exceeded in order to protect the communications network from overload and which is not actually exceeded due to the continuous signal gain control. The threshold value provides the indispensable basis and orientation for the continuous signal gain control. If the system did not know which signal level is desired and aimed for in the communication mode, it would not be possible, in view of the signal strengths varying over time, to carry out any meaningful signal amplification, i.e. the stronger or lower signal amplification required on a case-by-case basis, which is necessary in order to maintain the signal level aimed for with the continuous signal strength control. 84

From this point of view, the district court is correct in its assumption that a system which performs more comprehensive control tasks than required by the patent in suit by additionally acting on communication signals which, with regard to their level, do not in themselves require the intervention of a protective circuit, also fulfills those control tasks which require overload protection when signals with a high level occur, so that the performance spectrum of the protective control according to the patent is completely contained as a subset in those signal amplification controls which are provided in the case of comprehensive amplification control. 85

(3) 86

87

Level monitoring of the output signal is the task of a detector (feature 4) which, together with a control amplifier and a first attenuator arranged in the downlink path, forms a control loop (feature 3b aa).

Detector and control amplifier do not have to be located in the downlink path. 88
According to of the claim wording, it is only necessary that the first attenuator is positioned in the downlink path. There is no instruction to this effect for the other components of the control loop (detector and control amplifier); they merely have to be present (somewhere in the repeater) and form a functional control loop with the first attenuator.

The attenuator is intended to reduce (attenuate) the signal amplification in the downlink 89
path in the event that the setpoint is exceeded. is intended to reduce (attenuate) the signal amplification in the downlink path. The gap in the causal chain between the detector (which records actual values so that they can be compared with the setpoint stored for control) and the first attenuator (which reduces the signal strength to an amount below the setpoint if necessary) is closed by the control amplifier. It generates a manipulated variable for signal amplification from the data of the detector, which is fed to the first attenuator in order to control it (in the sense of attenuating the current level) (Sp. 2 Z. 19-22; BGH judgment p. 9 Rz. 17). The manipulated variable designates (represents) the amount by which the signal strength and thus also the amplification is to be reduced.

(4) 90

Whether the circuitry and/or signal processing is analog or - at least in some areas - digital 91
is not Patent claim 1 does not make any restrictive specifications as to whether the circuit arrangement and/or signal processing is organized analogously or - at least in some areas - digitally, which is why both variants are permitted and can be considered for the purposes of the invention (BGH judgment p. 11, para. 21). Accordingly, the form of organization, which is in principle freely chosen in this respect, determines the conditions of a simultaneous signal amplification control in the downlink and in the uplink path. It must take place "simultaneously" within the scope of what is permitted by the structural and processing conditions of the circuit in the individual case (BPatG judgment, p. 9). Of course, the person skilled in the art is aware that the requirements of transparency of the repeater in the communications network must be met, so that when selecting his circuit and signal processing, he will be careful to ensure that the amplification in the downlink path and in the uplink path (i.e., their effectiveness) do not diverge so far in time that there is an undesired readjustment of the transmitting power on the part of the base station or on the part of the mobile radio device (GutA p. 15).

bb) 92

To ensure that the signal gain in the uplink path can be reduced in the desired 93
manner to maintain or restore transparency, this path is also equipped with a (second) attenuator (features 3b cc). It is controlled by the control signal of a processing device (feature 6a), which is supplied by the control amplifier with the manipulated variable (= measure by which the signal gain must be reduced) that is also received by the first attenuator in the downlink path at the same time (feature 5). Due to this (identical) manipulated variable as the basis for actuating the first and the second attenuator, it is ensured that the signal gain is reduced to the same value in both the downlink and the uplink path (feature 6b; BPatG judgment, p. 9 below; ErgGutA I p. 3). 94

(1)

Achieving the same signal amplification in both paths does not require the use of identical manipulated variables. The fact that this is neither necessary nor sufficient in every case is clear to the skilled person in view of the fact that the downlink and the uplink paths will generally not be completely identical and symmetrical (ErgGutA I p. 4). Accordingly, the patent claim only states that the manipulated variable which is fed to the first attenuator in the downlink path on the one hand and to the processing device setting the second attenuator in the uplink path on the other hand results in the (attenuated) signal amplification in the uplink path corresponding to the (attenuated) signal amplification in the downlink path. Accordingly, the result of an identical signal amplification in both paths is essential and not whether the same or different manipulated variables are used for the control of the two attenuators (ErgGutA I p. 4 f.; cf. also paragraph [0010] of the patent application). The claim wording alone leaves no reasonable doubt that the control signal for the second attenuator does not have to be identical to the manipulated variable for the first attenuator, because features (5) and (6) are based on the fact that the same manipulated variable as for the first attenuator is communicated to the processing device (so that the measure of the required attenuation of the signal amplification is communicated), but that the processing device generates a control signal on the basis thereof which results in the (attenuated) signal amplification in the uplink path corresponding to the (attenuated) signal amplification in the downlink path. If the same manipulated variable had to be used, the manipulated variable could also be transmitted directly to the second attenuator; however, the patent claim does not order such a thing, but instead stipulates that a processing device is interposed, which generates the control signal from the manipulated variable communicated to it for the measure of the signal attenuation, which ensures that the same signal gain results in the uplink path as in the downlink path. From the point of view of the patent in suit, the control signal is therefore something qualitatively quite different from the manipulated variable, and it must be of such a nature that a signal attenuation of identical magnitude to the downlink path is produced. In the one case this may require that the control signal is equal to the manipulated variable for the first attenuator, in the other case this may require - due to a constructively different environment in the uplink path - that the control signal is suitably different from the manipulated variable for the first attenuator. No other understanding also underlies the invalidity judgment of the BPatG (judgment p. 9, 11). 95

(2) 96

Features (3a) and (5) are technically related in such a way, that the simultaneous transmission of the manipulated variable generated by the control amplifier to the first attenuator in the downlink path and to the processing device (feature 5) creates the circuitry prerequisite for the simultaneous attenuation of the gain in the downlink path and in the uplink path when a setpoint level in the downlink path is exceeded (feature 3a). This is also immediately obvious because the effect of simultaneous signal attenuation can quite obviously not be achieved if the manipulated variable determining the attenuation in both paths reaches the relevant components (the first attenuator for the downlink path and the processing device for the uplink path) with an impermissible (transparency-endangering) time offset. From a professional point of view, it is a technical matter of course - in addition to the timely signal input at the processing device - that following the transmission of the manipulated variable to the 97

processing unit, within the time period required for a the control signal suitable for the uplink path must subsequently also be generated by the processing device and this must be fed to the second attenuator.

(3)

98

Control amplifier and processing device do not have to be separate components, but can be combined in a comprehensive component (such as a microcontroller). microcontroller. The main claim of the patent-in-suit does not deal with any constructional details concerning the design of the control amplifier and the processing device. and the processing device. Both are defined exclusively by their intended technical function intended for them and beyond that are left entirely to the discretion of the skilled person. discretion of the specialist. The decisive functions - 1. the generation of a manipulated variable and its simultaneous supply to the first attenuator and a processing device (= control amplifier) 2. the generation of a control signal from the transmitted manipulated variable for the adjustment of the second attenuator in such a way that the signal amplification in the uplink path corresponds to that in the downlink path (= processing device)- can therefore be realized in any conceivable way and without further ado under the roof of a common construction unit, as long as within the only functional elements can be identified within the overall device which perform the respective tasks. These functional elements can be realized by different discrete components, but also by suitable software or in any other suitable way. suitable way.

2. 100

That the stationary repeaters D-1 make use of all features of the patent claim 1 cannot be established. 101

According to the entire content of the negotiations and the evidence collected (Section 286 (1) of the German Code of Civil Procedure), it remains open whether the stationary repeaters implement feature 6. ZPO), it remains open whether the stationary repeaters implement feature 6, i.e. whether a processing device ensures by means of a control signal that a second attenuator in the uplink path is set in such a way that the gain in the uplink path (7) corresponds to the gain in the downlink path (6). 102

a) 103

However, the defendant - which has to be taken into account in the assessment of the evidence to its However, the defendant - which is to be taken into account in the assessment of evidence to its detriment - repeatedly changed its presentation, whereby the changes in presentation - as will be shown in detail below - are in a conspicuous and therefore meaningful temporal connection to a procedural situation that is disadvantageous to the defendant. Since the defendant failed to provide any other plausible explanation for its changing submissions also at the hearing on July 25, 2023, the Senate is convinced that its conduct in the proceedings allows the conclusion that the defendant, with its new denials contradicting its previous submissions, is aiming to avoid a legal situation that is unfavorable to it and to escape the condemnation threatening it at the relevant state of affairs and of the dispute by making new, different allegations. Its factual submission is not oriented towards the truth, but is based solely on the intention to bring another argument into play with new allegations whenever a non-infringement argument has been refuted and has proven to be futile, in order to escape the (supposedly) threatened dismissal of its appeal. 104

105

aa)

As the plaintiff has explained in detail in the pleading of November 14, 2022 (p. 2-9) - to which the Senate initially refers to for the details - it corresponded to the defendant's own factual submission not only in the first instance (cf. only LGU pp. 7/8, 15, 16), but equally to its initial submission in the appeal proceedings (cf. grounds of appeal pp. 5, 7-11; reply brief pp. 3, 6) that the challenged embodiments - and consequently also the stationary repeaters - used an AGC with gain trailing function in the downlink path in order to avoid a loss of transparency in the communication between base station and mobile device. Only by way of example, the particularly meaningful passages in the defendant's factual arguments are reproduced below in their wording, which carry weight not least because they are based on the defendant's own extensive private expert opinion by an expert whose superior expertise the defendant expressly emphasizes (reply p. 3 above): 106

In the challenged design of the defendant, the gain is increased simultaneously in the downlink and in the uplink at low levels by means of AGC ("Automatic Gain Control", the aim of which is not to exceed the level at a defined point in the processing chain, cf. expert opinion of the (note: private) expert Dr. C, Annex B 1 at paragraph 44). 107

(Statement of defense p. 4 below, without differentiation between the repeater types) 108

The AGC used in the challenged embodiments of the defendant, described above under para. 1.2. requires both knowledge of the generated output level and consideration of the level of the received signal. This is clear from the D-GDU system description (see Exhibit GA-22-7 from Exhibit K 12 at page 25). It describes that the function of compensating the uplink gain based on the gain in the downlink is called "gain trailing" and is realized with an AGC. 109

(Statement of defense p. 5 below, without differentiation between the repeater types) 110

In particular, the challenged embodiment of the defendant uses the gain trailing function for the compensation of the uplink gain based on the downlink gain. compensation of the uplink gain based on the gain in the downlink, the "gain trailing" function is used, which is implemented with an AGC. ... The AGC used in the challenged embodiment of the defendant requires both knowledge of the generated output level and consideration of the level of the received signal. 111

(Statement of defense p. 8, without differentiation between the repeater types) 112

In a complete departure from this, the challenged embodiments are concerned with protection against loss of transparency when the gain is increased by means of AGC at low levels. In particular, the challenged embodiments of the defendant use the function "gain trailing" to compensate for the uplink gain based on the gain in the downlink. As can be seen from the D-GDU system description, the gain trailing function is based on an AGC and not on an ALC. It is also clear from the D-GDU system description that the loss of transparency must be combated especially when the gain is increased because of low levels - that is why the gain trailing function is used there. 113

(Statement of defense p. 9/10, without differentiation between the repeater types) 114

Even if the defendant is given credit for the fact that it may have been of the opinion that only mobile repeaters were the subject of the attack (cf. duplicate p. 11, 1st paragraph a.E.), the district court clearly stated in the contested judgment (p. 6, 2nd paragraph) that the plaintiff was attacking both stationary and mobile repeaters. paragraph) clearly stated that the plaintiff attacks both the stationary and the mobile repeaters of the D-1 series, as well as stated that the plaintiff argued in the context of the infringement discussion that in any case the AGC brought into play by the defendant for the downlink path bear the allegation of infringement (LGU p. 7, 1st paragraph), and that the defendant defended itself with regard to both repeater variants with the argument that the patent in suit requires an ALC, which is why the use of an AGC in the downlink path cannot be patentable (LGU p. 8, 1st paragraph). In the reasons for its decision, the LG justified its condemnation for both repeater types by stating that the patent in suit does not require an ALC (as is indisputably present in the uplink path of the challenged embodiments), but that the use of an AGC, as admitted by the defendant for the downlink path, is also in line with the patent (LGU pp. 15-16, 18). 115

The defendant filed an application for correction of the facts against the judgment of the Regional Court in a written statement dated March 4, 2019, but directed it exclusively against the factual finding that the sales range of the defendant includes repeaters of the product family D, which includes in particular the series D-1 and in particular repeaters of the type D-1 .... whereby it requested a correction to the effect that the repeaters D and D-1 do not belong to the same product family, but represent different product families standing side by side. From the fact of the correction request and its content, it can be concluded that the judgment of the Regional Court, according to the opinion of the defendant in all other respects, i.e. with regard to the claim against stationary and mobile repeaters and the defense for both variants with an AGC with gain trailing function installed in the downlink path to avoid an otherwise threatening loss of transparency, accurately reflects the factual and contentious state of the proceedings. 116

The contents of the grounds of appeal - which date from the period after the failed settlement negotiations between the parties (BB p. 2/3) - emphatically confirms this finding, as the following, merely exemplary text quotations demonstrate: 117

It is also incorrect that feature M2 is already realized by ALC technology in the uplink path and AGC technology in the downlink path. (p. 5 below) 118

... 119

*The skilled person recognizes from the description of the patent in suit (...) that an "automatic level control" is to be understood as an Automatic Level Control (ALC) designated in communications engineering. According to feature M2, this ALC ... **simultaneously** reduce the gain in the downlink path and in the uplink path if a target level is exceeded in the downlink path. From paragraph 0009 of the patent-in-suit, the skilled person understands that when the automatic level control in the downlink path responds, the gain in the uplink path is adjusted **simultaneously**.* 120

As can be seen on page 2 of Exhibit BK7[ii], the "Gain trailing algorithm" functionality is listed under the "Features" section, with the following explanation:: 121

Gain trailing algorithm onboard applications	*UL gain follows DL by a user programmable offset, used for*	122

Gain trailing algorithm UL (Uplink) folgt DL (Downlink)-Verstärkung mit einem benutzerprogrammierbaren Versatz (German translation) 123

The gain trailing algorithm thus has the functionality that the uplink gain follows the downlink gain (DL gain) with a user-programmable offset. The gain trailing function is based on an AGC and not on an ALC. 124

(p. 6) 125

The view of the district court that feature M3 is already realized by the AGC technology in the downlink path is incorrect. In particular, the statements of the Regional Court are limited to the fact that a detector of the AGC technology would have at least the same function as a detector in the sense of feature M3 (...). 126

The district court does not address at all the fact that M3 also requires that the detector form a control loop together with a control amplifier and with an attenuator explicitly placed in the downlink path. 127

The district court fails to recognize that the challenged design uses AGC technology with a gain trailing algorithm in the downlink. The gain trailing algorithm has the functionality that the gain of the uplink (UL gain) follows the gain in the downlink (DL gain) with a user-programmable offset (...). 128

(p. 7) 129

*As discussed above with respect to features M2 and M3, the AGC technique of the challenged embodiment with "gain trailing" function is an automatic "**trailing gain**" with a deliberate offset... .* 130

(p. 9) 131

In the absence of any differentiation, the defendant's factual argument can only be understood to mean that the assertion of an AGC with gain trailing function in the downlink path applies to all challenged embodiments, thus to mobile and stationary repeaters without distinction. That this is the case is first confirmed by the fact that the grounds of appeal differentiate between mobile and stationary repeaters at another point (cf. p. 7, 11), and is additionally confirmed by the defendant's reply of 31.01.2020, in which the above technical statements are repeated analogously and in part even verbatim - also and especially for stationary repeaters (p. 4 below - p. 6 above). The remarks on p. 4 below and p. 6 above are particularly significant: 132

However, the stationary repeaters of the challenged embodiment D-1 do not constitute an infringing form either, because even if one may follow the expert in the realization of features M3, M5 and M6 (quod non), feature M2 is also not realized in stationary repeaters of the challenged embodiment D-1, as will be shown below. 133

simultaneous/at the same time

134

On page 20 of the expert report, the court expert refers to page

135

*28 of Annex GA-22-7 with regard to simultaneity/simultaneity in feature M2 for an explanation of "gain trailing". From this Annex GA-22-7, the court expert concludes solely that simultaneity/simultaneity in the sense of feature M2 is given. However, Annex GA-22-7 does not refer to the challenged embodiment D-1, but to the ... different series of type **D.***

(p. 4) 136

The gain trailing algorithm thus has the functionality that the gain of the uplink (UL gain) 137
follows the gain in the downlink (DL gain) **with a** user-programmable **time offset** (...). Thus, simultaneity is just not provided. The gain trailing function ... is based on an AGC and not on an ALC.

(p. 6) 138

Insofar as the defendant criticizes in the first quoted passage that the expert based 139
his considerations on Annex GA-22-7, which in fact concerns a different product series and therefore has no significance for the design of the challenged embodiment, this does not constitute a significant denial (making it necessary to take evidence) of the claim based on the expert opinion regarding the equipment and mode of operation of the stationary repeaters.

Accordingly, in its first appeal hearing on March 5, 2020, the Senate extensively explained 140
its understanding of the technical teaching of the patent in suit, as shown in the minutes of the hearing, and against this background - with express reference to the duty of truth in civil proceedings - asked the defendant to clarify conclusively which individual claim feature(s) - differentiated according to mobile and stationary repeaters - is (are) to be disputed by it. The Senate made it clear (Prot. p. 3 below) that the equipment of the challenged repeaters in the downlink path with an AGC is regarded as undisputed.

The defendant did not raise any objections to this starting point, but justified the alleged 141
non-infringement of the patent in suit by the stationary repeaters solely on the grounds that the control signal generated in the control loop of the downlink path was not fed to the processing device, but that the control signals for both paths were independent of each other, without there being a link branch in particular (Prot. p. 3/4).

Accordingly, on March 5, 2020, the Senate decided to conduct an expert evidentiary hearing 142
to determine, among other things, whether the aforementioned admission of the defendant is plausible on the basis of the product documents available for the stationary repeaters or whether the contents of the file allow the safe conclusion that the first attenuator in the downlink path and the processing device for the second attenuator in the uplink path are simultaneously supplied with the manipulated variable generated in the control amplifier for the variation of the signal amplification.

In a supplementary expert opinion dated November 17, 2020, the expert stated the 143
following with regard to the defendant's stationary repeaters - based on the AAM block diagram according to Annex GA-22-6 (ErgGutA I p. 8/9):

... The microcontroller receives an output signal from the detector (...) ... and generates 144
the manipulated variable (...) ... which is fed to the first attenuator (...).

145

At the same time the same microcontroller forms the processing device ... . From the ... Figure shows that the control signal (...) is transmitted from the microcontroller to the second attenuator (...), whereby the control signal is recognizably the only signal for setting the second attenuator.

Thus, since the sophisticated control amplifier and the sophisticated processing device are constituted by one and the same physical device of the challenged embodiment - namely, the microcontroller - the supply of the manipulated variable from the microcontroller to the same microcontroller - ... - in the challenged embodiment, is realized in a trivial manner. This feed also takes place simultaneously in an equally trivial manner. 146

In its statement of 29.01.2021 on the supplementary expert opinion, the defendant deals with the stationary repeaters on pages 6-14. It argues that, according to the circuit diagram in Annex GA-22-6, the control amplifier is not located directly in the downlink path, namely in the signal path between the receive antenna of the base station and the supply antenna of the mobile radio (pp. 7-10), that the control amplifier and the processing device must be structurally separate components and thus cannot be formed by one and the same microcontroller (pp. 10-13), and that the GA-22-6 system cannot provide any valid evidence that the same manipulated variable is fed simultaneously, because there is still the possibility, which has not been eliminated, that the manipulated variable generated by the control amplifier is temporarily stored before it is forwarded to the processing device, and that the content of the manipulated variable in question may have been changed beforehand (pp. 13-14). On the other hand, not a single word denies that the stationary repeaters have an AGC with gain-trailing function, which prevents a loss of transparency. 147

In its decision of April 19, 2021, the Senate also pointed out that the above theoretical considerations regarding a possible intermediate storage of the manipulated variable and its change in content (the technical meaning of which is not apparent anyway) do not constitute a significant dispute that would compel the taking of evidence. Accordingly, the repeated objections of the defendant that the expert could not take from the documents any unalterable evidence that a manipulated variable for the transparency-preserving signal amplification in the downlink and in the uplink path is given simultaneously to the first attenuator and to the processing device are also wrong. Such evidence is not required as long as the claim of the plaintiff that such is done in the challenged embodiment is not substantially disputed. 148

After the expert, in a second supplementary report dated November 1, 2021, answered the extensive questions submitted by the parties for the initially scheduled oral hearing of the expert (plaintiff's brief of April 29, 2021; defendant's brief of April 29, 2021, pp. 9-12), the defendant submitted for the first time in its brief of December 30, 2021 (pp. 18-20). 04.2021, p. 9-12), the Defendant submits for the first time in its written statement of 30.12.2021 (p. 18-20) that the stationary repeaters in the downlink path are not to be equipped with an AGC, but - as can be seen from Exhibit GA-22-5 (p. 50, 1st paragraph) - with an ALC. This assertion is indeed supported by the cited document, which mentions an equipment of the AAM with ALC. However, it is diametrically opposed to the entire preceding unambiguous argumentation of the defendant, which has always vehemently insisted that in the downlink path no ALC (allegedly required by the patent in suit) is provided, but instead an (from the point of view of the patent in suit insufficient) AGC with gain trailing function. AGC 149

with gain trailing function (insufficient from the point of view of the patent in suit) is provided in the downlink path, which - as the expert pointed out at his hearing on July 25, 2023 (AnhProt. p. 4) - is also supported by Exhibit GA-22-8. In view of this clear written submission and the identical statement in the appeal hearing, the defendant cannot honestly refer to the fact that the opposite of what it itself asserted in its legal defense is to be derived from - after all - its extensive documents. It therefore remains the case that the defendant changed its party submissions following the supplementary opinion unfavorable to it, without providing a conclusive explanation for this.

At the hearing on August 11, 2022, the defendant repeated the equipment of 150
the downlink path with an ALC (Prot. p. 1) and, upon request (Prot. p. 2-3), clarified the written denial of a simultaneous manipulated variable transmission in the challenged embodiment to the effect that the signal gain control in the downlink and in the uplink path takes place independently of each other, merely using the same microcontroller. The uplink path is equipped with its own devices, in particular its own detector, which is why the signal gain control in the uplink path does not depend on the manipulated variable generated in the downlink path (Prot. p. 3 center). At the request of the Senate, the defendant agreed to provide details in writing of the structural and circuit conditions that are intended to ensure transparency in the challenged stationary design (Prot. p. 3, bottom).

In written submissions dated September 2, 2022 (pp. 2-4) and December 22, 2022 151
(pp. 8-10), the defendant - enclosing a circuit diagram that it had edited in color and additionally labeled (p. 3) - the alleged design details of its stationary repeaters and in this context - which does not constitute a denial of such equipment in the challenged design - additionally pointed out that stationary repeaters do not require any measures at all to avoid a loss of transparency (p. 4).

In his third supplementary opinion of April 28, 2023, the expert examined 152
the defendant's explanations and came to the conclusion that the explanations were largely without detail, technically meaningless and incomprehensible, which led him to the assessment that the defendant's submission did not even begin to show how transparency could be ensured in both signal paths independently of each other, which is why the previous expert assessment that the stationary repeaters use the features of the patent in suit had to be retained. The fact that the stationary repeaters do not ensure transparency cannot be inferred from the defendant's submissions - which also corresponds to the Senate's understanding of the state of affairs and the dispute at that time.

bb) 153

The last remark is of relevance insofar as the defendant in its statement 154
of June 15, 2023 on the third supplementary opinion does not make any attempt to improve its factual presentation, which was assessed by the expert as completely insufficient, on a transparency regulation deviating from the patent in suit, and also does not counter the expert's criticism, but accepts it without contradiction, but instead denies - for the first time - that measures were taken at all with the stationary repeaters to avoid a loss of transparency (p. 4 above).

155

Apart from the fact that this denial conspicuously takes up a non-infringement argument raised by the expert in his third supplementary opinion, the assertion of which is directly explained by the fact that, according to the state of the legal dispute at that time, all other objections of the defendant against the infringement action were foreseeably doomed to fail, so that there was a threat of upholding the conviction due to the stationary repeaters, the current denial is quite obviously not compatible with the promise of the defendant given at the hearing on 11 August 2022 to voluntarily provide clarity about the technical manner in which transparency is to be created in the challenged embodiment if it is not possible to use the position variable generated in the downlink path. 08.2022 to voluntarily clarify in which technical manner transparency is to be established in the challenged embodiment, if the control variable generated in the downlink path is not used for the signal amplification. Because if - as is now claimed - there were no transparency at all in the stationary repeaters, it would be completely pointless from the outset to explain to the process participants how it is to be possible in the attacked embodiment to establish transparency in the downlink path and in the uplink path independently of each other.

It is against this background that the defendant's brief of June 15, 2023 (p. 12 et seq.) is to be assessed. 156

Insofar as the defendant objects there - for the first time - that the stationary repeaters are used exclusively for trunked radio in very specific frequency ranges for which no transparency precautions are required, this already does not result in the assertion - contradicting everything that has been said so far - that the stationary repeaters are incapable of avoiding a loss of transparency. This also does not follow from Annex GA-22-5. If it is stated there that the AAM modules are used for all frequency bands in the range of 68 - 500 MHz, this also only refers to the intended use of the defendant (not even exclusively according to the strict wording of the formulation) and thus does not say anything completely clear about the objective performance of the product to be distinguished from this. For there may be good reasons to avoid a loss of transparency even where it is not absolutely necessary, e.g. in the interest of a manageable product range and its versatile usability for different fields of application. The defendant itself does not claim that transparency measures (according to the patent) would be harmful if the repeater were used in trunked radio and would therefore have to be omitted. 157

The further assertion is also irrelevant (note: underlining added): 158

*According to the information provided by the managing director of the defendant and appellant based on the statements of the defendant's product management, the challenged **stationary repeaters with AAM module** (Exhibit GA-22-6) do not have any functions installed that are designed to prevent a loss of transparency based on a response in the downlink path.* 159

(p. 12 below) 160

Since the right to bring an action is a property patent which provides comprehensive protection against any device which, due to its technical equipment, is objectively capable of realizing the claim features, completely irrespective of whether this suitability is used or is intended to be used according to the instructions of the infringer, it is legally irrelevant whether the stationary repeaters are equipped with devices which are intended to avoid a loss of transparency. Only the technical suitability of the repeaters for this purpose is relevant, which the defendant does not deny with the above-quoted assertion. 161

At a later point (p. 14 above), the defendant does formulate (note: underlining added): 162

The attacked stationary repeaters with AAM module are neither designed for 163
mobile radio systems for mobile phones/smartphones, e.g. GSM, LTE, UMTS, nor are they suitable for this type of mobile radio system. Furthermore, the attacked stationary repeaters with AAM module are not used for mobile radio systems for mobile phones/smartphones, e.g. GSM, LTE, UMTS, in tunnel systems or buildings.

which can be understood as a (considerable) denial of a technical suitability 164
of the repeaters to avoid a loss of transparency. However, the defendant once again does not provide any plausible explanation for the new factual argument contradicting everything that has been said so far; the reference to "information provided by its managing director, who claims to have relied on statements made by the product management" is meaningless, empty of content and for this reason alone - apart from the extremely questionable truth value - unsuitable. However, it would have been up to the defendant to explain the change of presentation in a comprehensible way. The defendant does not provide such an explanation - even when expressly asked at the hearing on July 25, 2023.

b) 165

However, the lack of truthfulness in the defendant's factual submission does not in all 166
circumstances mean that the opposite of what has been (untruthfully) asserted should be assumed. Sometimes lawsuits on the part of the party and/or its lawyer are in terms of a clear, complete and truthful submission from the outset (Section 138 of the German Code of Civil Procedure (ZPO)), proceedings are sometimes simply poorly conducted by the party and/or their lawyer, with the result that the true facts only come to light in the course of a long legal dispute.

In addition, the plaintiff, who has the burden of proof, must also allow itself to 167
be reproached for having relied exclusively on the obviously incomplete findings of the inspection procedure for years, instead of using the time of the infringement proceedings to improve its knowledge situation for the current legal dispute, e.g. by making a test purchase (if necessary via intermediaries). The plaintiff itself does not claim that such clarification measures would have been impossible or unreasonable for it. There is nothing else to suggest that this would have been the case.

c) 168

In the given initial situation, the decisive factor is that the expert at his hearing 169
on July 25, 2023 comprehensibly explained that the device documents available for the challenged stationary repeaters, which originate from a time that is not in dispute and which therefore cannot be met with the skepticism of a procedural falsification of their content, are compatible with the factual arguments for non-infringement that the defendant most recently made.

aa) 170

Annex GA-22-5, which, according to its heading, refers to the product group ... and thus 171
to the attacked embodiments, states on page 1, left column, that the D-1 can be used for both stationary and mobile applications. It literally states:

172

It is intended to be used for onboard applications such as in trains, outdoor coverage extension, in-building and in-tunnel applications.

(Es ist dafür vorgesehen, für Anwendungen an Bord wie in Zügen, Abdeckungserweiterung im Freien sowie für Anwendungen innerhalb von Gebäuden und Tunneln verwendet zu werden.)

At the same point, reference is made to two principal configuration options for the D-1 -

The D-1 is available in two different configurations:

- *Fibre fed remote unit*
- *Radio repeater unit*

(Die D-1 ist in zwei verschiedenen Konfigurationen erhältlich:

- *Glasfasergespeiste Ferneinheit*
- *Funkrepeatereinheit) -,*

with which system GA-22-5 concerns both mobile *(= radio repeater unit) and stationary (fiber-fed) units.*

Under the heading "Features," Exhibit GA-22-5, page 2 describes the "gain trailing“-:feature as follows:

Gain trailing algorithm: UL gain follows DL gain by a user programmable offset; used for onboard applications

(Verstärkungsfolgealgorithmus: Die Signalverstärkung im Uplink folgt der Signalverstärkung im Downlink mit einem Versatz, welcher von dem Anwender programmiert werden kann; verwendet für Anwendungen an Bord)

There is no indication that the functionality generally described for the D-1 and thus for both device versions does not apply to the stationary application variant.

Depending on the offset programmed by the user, there are two different cases of "gain trailing".

If the offset is not equal to zero, the signal amplification in the uplink follows that in the downlink with an offset. As the expert stated at his oral hearing on July 25, 2023, it is clear to the person skilled in the art that the user-selectable "offset" is not a time lag (of the signal gain in the uplink path relative to the signal gain in the downlink path), but a level offset, which can be expressed in particular in decibels (AnhProt. p. 4). Consequently, Annex GA-22-7 proposes an offset - understood in precisely this way - in the range between 3 and 5 decibels for mobile repeaters and also justifies its appropriateness. Exhibit GA-22-7 does not pertain to the challenged embodiments; however, the technical justification given has general validity and therefore makes technical sense for the D-1 series as well. In the case of "gain trailing" with an offset the

signal amplification in the uplink follows that in the downlink with the preset level offset, so that the signal amplifications in both paths do not correspond - precisely because of the level offset.

If the offset - in the sense of the second alternative - is zero, then the signal amplification in the uplink path is identical to that in the downlink, which ensures transparency within the meaning of the patent in suit in any case. 188

According to the expert's explanations at his hearing on July 25, 2023, the reference "used for on-board applications" in Annex GA-22-5 is to be understood as meaning that "gain trailing" with an offset not equal to zero is used for the reasons described in Annex GA-22-7 when the D-1 is used in a train, which corresponds to the design of a mobile repeater (AnhProt. p. 4). In contrast, it cannot be inferred from the text that the variant with an offset of zero, in which the gain in the uplink corresponds to that in the downlink and thus transparency is given, would not be used for stationary repeaters, for example. Rather, the opposite is the case, namely that the offset should be set to "zero" precisely for a stationary application, so that no "gain trailing" takes place and consequently transparency is maintained. A fortiori, the reference to "on-board applications" should not be understood to mean that the suitability for "gain trailing" would no longer exist in an application other than "on-board". 189

bb) 190

The foregoing finds confirmation in Exhibit GA-22-3, which admittedly concerns D 2 instead of D-1. Apart from the identity in the functionality of both variants - D-1 and D-2 – according to the data sheet, however, it corresponds to the defendant's own submission that the number "..." in the product designation of the attacked embodiments only concerns the arrangement in a rack with ... inch, which is not the case with the D-2 (p. 4 of the grounds of appeal): 191

The type D-1 repeater of the challenged embodiment is based on the D-2 product family, hence D(1)-2. Again, the 1 represents only the arrangement of the repeater in a ..." inch rack. 192

The header of Appendix GA-22-3 shows that the D-2 is arranged in an enclosure, whereby two types of enclosure are shown. This is consistent with the reference in the left-hand column to the possibility of an enclosure with active cooling or one with passive cooling: 193

The digital repeater units D-2 for up to 5 independent frequency bands in the active cooled housing and up to 3 frequency bands in the passive cooled housing has been designed to extend radio coverage in various radio networks. 194

(Die digitalen Repeatereinheiten D-2 für bis zu 5 unabhängige Frequenzbänder in dem aktiv gekühlten Gehäuse und bis zu 3 Frequenzbänder in dem passiv gekühlten Gehäuse wurden entworfen, um in verschiedenen Funknetzwerken die Funkabdeckung auszuweiten.) 195

In contrast, Appendix GA-22-4 shows an arrangement for a rack for the D-1. Appendix GA-22-5 describes this housing of the D-2 - in contrast to the D-1 variant for the rack - as a housing for outdoor use (p. 3 (49)): 196

197

Note that the DRM units for the ...” rack feature a heat sink for front to back cooling while the DRMs for the outdoor housing are directly mounted onto the latter and do not feature any heat sink and no ...” front plate.

(Beachten Sie, dass die DRM-Einheiten für den ... Zoll Rack eine Wärmesenke für die Kühlung von vorne bis hinten aufweisen während die DRMs für das Gehäuse für die Verwendung im Freien direkt auf dem Letzteren montiert sind und weder eine Wärmesenke noch eine ... Zoll Frontplatte aufweisen.) 198

Also, in the rest of document GA-22-5, the two variants - ... inch rack on the one hand and housing for outdoor use - are compared, whereby it is obvious according to the expert's explanations at his hearing that the D-2 variant with the housing for outdoor use is particularly suitable for stationary applications. On the other hand, there are no technical differences between the D-2 and the D-1 that are relevant to the functionality of the "gain trailing" (Appendix, p. 4). 199

cc) 200

Finally, the presence of gain trailing in the stationary challenged embodiment can also be seen in Exhibit GA-22-8. This is a user manual or a quick configuration guide. On page 4 (...) it is described that according to the default settings the AGC is switched on, the gain trailing is also switched on and the offset of the gain trailing is zero. From the user interface according to Figure 13 it is clear that the unit decibel (dB) is provided for the offset of the "gain trailing". Although the heading again refers to the D-2 and not to the D-1 in dispute, the above findings are nevertheless applicable to the latter. The document title "D-D-1-QuickStart_UserManual_VB" already indicates that the D-1 design variant is covered. This is also obvious because the D-1 and the D-2 - as already stated - essentially differ in terms of their housings and, as shown in Annexes GA-22-3 and GA-22-4, there is no difference between the two variants - D-2 and D-1 - in terms of the operating options, as listed in each case on page 2 of the document under the heading "Features" and the subheading "Access". 201

dd) 202

Despite this starting position favorable to the applicant, however, it has remained unclear whether gain trailing occurs through the AAM with which the stationary repeaters are equipped. However, only the AAM as described in Exhibits GA-22-5 and GA-22-6 forms a basis for the realization of claim features 3.b) aa), 3.b) cc), 5 and 6.a) related to the first and second attenuator. That the AAM is used for signal paths where gain trailing occurs cannot be established with the necessary certainty. 203

Annex GA-22-8 shows the above-mentioned setting option of "gain trailing" only for DRMs (AnhProt. p. 4). The possible communication protocols mentioned in this context are GSM, UMTS, LTE and LTE 20 MHz, i.e. mobile radio protocols of different generations that are potentially in use alongside each other and must therefore all be served by a repeater. As can be seen from Annex GA-22-4, the protocols in question exclusively use frequencies in the range above 790 MHz. 204

However, according to the defendant's uncontradicted submission, the AAM is not set up for use in this frequency range, but only for operation in a lower frequency range. This is consistent with the information in Exhibits GA-22-5 and GA-22-6, which state that the AAM is used for frequency bands up to 500 MHz. In this frequency range, for example, the TETRA protocol used by security authorities operates, but not any of the GSM, UMTS, LTE or LTE 20 MHz protocols (AnhProt. p. 4/5). 205

Insofar as "gain trailing" takes place for the GSM, UMTS, LTE or LTE 20 MHz protocols by the attacked embodiment, this takes place without the recognizable realization of features 3.b) aa), 3.b) cc), 5 and 6.a), which are only used for the AAM through which the respective signal path for the associated frequencies does not pass. With the GSM, UMTS, LTE or LTE 20 MHz protocols, the transmission power is dynamically adjusted both in the uplink and in the downlink on the basis of the signals received by the base station or mobile device, which also makes it necessary to make changes to the attenuation or gain in the downlink and in the uplink at the same time in the case of a stationary repeater (Annex, p. 5) in order to avoid a loss of transparency. This is also achieved by "gain trailing" with a preset offset of 0. However, it can only be concluded from this that the "gain trailing" for the aforementioned mobile radio protocols is obviously implemented without the involvement of the AAM, which does not make it clear that the implementation outside the AAM is carried out in a way that realizes all the claim features of the patent in suit. 206

For communication protocols in the frequency range in which the AAM is used, it is not apparent that "gain trailing" makes any technical sense at all. For example, the expert stated at his hearing that with the TETRA protocol, the transmission power of the base station in the downlink is constant (AnhProt. p. 5). In such a situation, measures to prevent the loss of transparency are not necessary. 207

ee) 208

But even if "gain trailing" with zero level offset were also realized for the low frequency ranges of the AAM, it cannot be determined that the "gain trailing" is implemented by the circuit in the AAM. 209

3. 210

For the mobile repeaters of type D-1, it is also not possible to establish with sufficient certainty that they realize the features of the patent in suit. In any case, the existence of an adjustable attenuator in the uplink path has not been clarified. 211

a)

212

As the court expert explained to the conviction of the Senate, there are no conclusive indications allowing for findings of fact that the defendant's repeaters have a second adjustable attenuator in the uplink path, the signal attenuation of which can be changed arbitrarily (ErgGutA I p. 10-12). The tender documents say nothing in this connection (ErgGutA I p. 11); the use of an adjustable attenuator is also not a technically mandatory requirement for the simultaneous regulation of signal amplification in the downlink and uplink paths envisaged by the patent in suit. Rather, the same technical success can also be achieved in a completely different way, for example by 213

connecting a constant attenuator in series with an adjustable amplifier. The plaintiff's argument that the block diagram in Annex BK 15 offers no indication of such a design variant, because no control signal lines to the two attenuators and also no control input into the amplifiers are shown, via which the amplifiers could receive a control signal from the FPGA (Field Programmable Gate Array) and could be adjusted via this, does not hold water. It is already doubtful whether it can be reliably concluded from the silence of the block diagram (as merely an overview of the principle) regarding a certain technical equipment that there are no further technical equipment details apart from what is shown in the block diagram. As the expert explained at his hearing on 25.07.2023, the block diagram does not have a level of detail that justifies expecting it to show what type of amplifier (adjustable or non-variable) is used and which signal lines are provided (AnhProt. p. 6).

Ultimately, however, this can rest on its own. Even in the absence of an adjustable amplifier, the plaintiff's objection could at best be conclusive if there were no other technical possibility for adjustable signal attenuation apart from the combination of a constant attenuator and an adjustable amplifier, so that the absence of the alternative solution mentioned as an example by the expert could necessarily lead to the conclusion that an adjustable attenuator must be used. The plaintiff would have had to demonstrate that there is no second alternative solution that would prohibit the aforementioned conclusion that an adjustable attenuator is present. This is because it is her responsibility to present the facts of the infringement. If she cannot demonstrate the use of a second adjustable attenuator in the uplink path (see below), it is up to her to provide conclusive evidence of indirect infringement. However, the plaintiff does not even claim that there are only two technically and economically reasonable options for patent-compliant signal attenuation (namely the use of an adjustable attenuator or the use of an adjustable amplifier), and no third option. Thus, the finding - once assumed in favor of the plaintiff – that no adjustable amplifier is used in the challenged embodiment does not support the conclusion that an adjustable attenuator must be used as a result. Ultimately, indirect evidence will be completely out of the question, because even with expert help it will not be possible to theoretically clarify whether the defendant has not found another, inventive alternative solution, which could, for example, be its proprietary know-how, so that even an expert would not be able to exclude in good conscience that the attacked embodiment implements simultaneous signal attenuation without an adjustable attenuator and without an adjustable amplifier. 214

In this context, it is irrelevant whether an attenuator can only be understood as an analog component or whether the term also covers digital versions. Even if the latter were to be assumed in favor of the plaintiff, it must in any event be noted that the plaintiff does not submit anything of substance regarding the specific design of the challenged mobile repeaters from which it could be inferred with the necessary certainty that they achieve simultaneous attenuation of the signal strength in the uplink path with the aid of an adjustable digital attenuator. It is not entirely clear what the plaintiff wants to see as an adjustable digital attenuator in the present case. If the plaintiff refers to an FPGA used by the challenged embodiment, this reference falls short because an FPGA is in principle a freely programmable 215

"black box" whose technical classification as a component with a specific function and effect is only possible if the way in which it is programmed is known. In the absence of more detailed knowledge of the challenged embodiments, the plaintiff itself does not provide any information in this regard.

Instead, it refers to the defendant's statement in its appeal reply of January 31, 2020, according to which the challenged mobile repeaters use so-called DRMs (Digital Radio Module), as can be seen from Annex BK 15. This submission does not lead any further because the defendant's statement (made by the plaintiff as its own) refers to the downlink side, while feature (6a) is about the equipment of the repeater in the uplink path. 216

But even if the defendant's submission were to apply in the same way to the uplink side, the result is no different. Since the plaintiff does not claim anything to the contrary, the following signal processing in the FPGA is to be assumed with the defendant's submission in the reply: In the DRM of the downlink path, the analog signal emitted by the encoder is converted into a digital signal and then fed (in digital form) to the FPGA. After the signal processing in the FPGA (about which the defendant admissibly provides no further details), the (however) processed digital signal is output again to the outside via an amplifier of the DRM (about the functioning of which the defendant admissibly also provides no further details). The fact that a variable signal attenuation takes place is just as little apparent from this as the use of an adjustable attenuator or the use of a variable amplifier. It would therefore have been up to the plaintiff to explain that and why both should be assumed in view of the defendant's submission. 217

If the challenged embodiment combines a constant digital attenuator with a downstream adjustable amplifier, it should still be noted that in such a situation the digital attenuator would not be an adjustable one, as required by the clear wording of the patent claim. 218

b) 219

Insofar as the plaintiff sees an equivalent embodiment in the above-mentioned combination (constant attenuator adjustable amplifier), the existence of which it denies elsewhere (block diagram) - for the first time - it cannot be followed in any case because the requirement of obviousness of the modification is not met when the patent claim is taken as a basis. 220

If the challenged embodiment were to make use of a constant - instead of an adjustable - damping element as required in the patent claim, the defendant is doing the exact opposite of what the patent in suit encourages the skilled person to do. The technical teaching of the patent claim is therefore not implemented in a technically different way, but is ignored, which means that there is a lack of the necessary orientation towards the patent claim. That this is the case is also evident - apart from the contrasting pair of an adjustable and a constant (= non-adjustable) attenuator - from the fact that the defendant owes the same technical success to a completely different solution concept for ensuring simultaneous equal signal amplification in both paths. While the patent in suit relies on bringing about the synchronization of the signal strength by attenuating (reducing) the given signal amplification when necessary, *the attacked embodiment takes the - fundamentally different - path of reducing the signal strength independently of demand,* 221

due to the constant attenuator, and then increasing it again to the correct level when necessary with the aid of an adjustable amplifier. Apart from the ultimately same technical success, this has nothing to do with what the patent in suit teaches.

As a precautionary measure, the same considerations apply to the stationary repeaters insofar as they affect the frequency range and the communication protocols that lie outside the frequency range of the AAM. 222

III. 223

1. 224

The decision on costs follows from Sections 91 (1), 91a, 96, 269 (3) ZPO, whereby the cost ratio of the disputed decision applies to the settled injunction part because it is equitable to base the cost burden on the outcome of the proceedings to be expected without the declarations of settlement. 225

In deviation from the allocation of costs in accordance with the success and loss of the case, the costs of the taking of evidence undertaken in the appeal proceedings, insofar as they were incurred in connection with the second and third supplementary expert opinion of the expert, are to be borne solely by the defendant, because the relevant expert investigations and the associated expert and party costs are largely caused by its factual submission, which is untruthful in decisive points and does not support the dismissal of the action. In this respect, the Senate makes use of the possibility provided for in Section 96 ZPO to order the costs of an unsuccessful defense to be borne by the party that asserted it, even if it (like the defendant) prevails on the merits. This takes into account the sanctioning nature of Section 96 ZPO and the inducer principle expressed therein (BGH, NJW 2019, 2464) (see KG, judgment of 10 February 2021 - 25 U 160/19). February 2021 - 25 U 160/19), which in this case in particular prohibits charging the unsuccessful plaintiff with the unnecessary costs of the last two supplementary expert opinions, because her possibilities of gaining knowledge about the exact equipment and functioning of the stationary repeaters were limited from the outset due to the extraordinary complexity of the technical facts, which gives special weight to the defendant's procedural obligation to make a complete and truthful submission at all times (Section 138 ZPO). The costs for the second and third supplementary expert opinion as well as the party and expert costs for the hearing on August 11, 2022 are affected by the defendant's obligation to bear costs. 226

2. 227

The orders for provisional enforceability are based on Sections 708 No. 10, 711 ZPO. 228

3. 229

There is no reason to allow an appeal on points of law because the requirements set out in Section 543 ZPO are clearly not met. As a purely individual case decision, the case is neither of fundamental importance within the meaning of Section 543 (2) No. 1 ZPO nor does the safeguarding of uniform case law or the further development of the law require an appeal court decision within the meaning of Section 543 (2) No. 2 ZPO. In particular, the Senate's interpretation of the patent is fully in line with the understanding of the Federal Court of Justice in its nullity appeal judgment of 20.01.2022. 230

4. 231

The settlement of the application for injunctive relief does not justify a reduction in the amount in dispute. Since the defendant continued to offer and sell the challenged repeaters until the expiry of the property right (see minutes of March 5, 2020, p. 1/2), the original claim for injunctive relief turns into a claim for damages of equal value as the period of time progresses. 232

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[i] ... which is why the second attenuator must be an adjustable attenuator. 233

[ii] = Annex GA-22-4 of the Survey-GutA. 234
