Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 12 November 2014

Case Number: T 2078/11 - 3.5.05

Application Number: 06251409.6

Publication Number: 1793521

IPC: H04L5/02, H04L27/26

Language of the proceedings: EN

Title of invention:
Variable distribution of common pilot symbols in OFDM

Applicant:
FUJITSU LIMITED

Headword:
OFDM pilot distribution/FUJITSU

Relevant legal provisions:
EPC 1973 Art. 56, 84
RPBA Art. 13(1)

Keyword:
Clarity - main request and auxiliary requests 1 to 3 (no)
Inventive step - auxiliary requests A, 1A, 2A, 3A (no)
Admission of auxiliary requests B, 1B, 2B, 3B, 4A - (no)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 2078/11 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 12 November 2014

Appellant: (Applicant)	FUJITSU LIMITED 1-1, Kamikodanaka 4-chome, Nakahara-ku Kawasaki-shi, Kanagawa 211-8588 (JP)
Representative:	Stebbing, Timothy Charles Haseltine Lake LLP Lincoln House, 5th Floor 300 High Holborn London WC1V 7JH (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 1 April 2011 refusing European patent application No. 06251409.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair	A. Ritzka
Members:	K. Bengi-Akyuerek
	G. Weiss

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division, posted on 1 April 2011, to refuse European patent application No. 06251409.6 on the ground of lack of inventive step (Article 56 EPC) with respect to a main request and two auxiliary requests, having regard to the disclosure of

D1: EP-A-1 542 488.

II. Notice of appeal was received on 8 June 2011. The appeal fee was paid on the same day. With the statement setting out the grounds of appeal, received on 11 August 2011, the appellant re-filed the claims according to the main request underlying the appealed decision and claims according to three auxiliary requests. It requested that the decision of the examining division be set aside and that a patent be granted on the basis of the main request or one of the auxiliary requests.

III. A summons to oral proceedings scheduled for 12 November 2014 was issued on 1 July 2014. In an annex to this summons, the board gave its preliminary opinion on the appeal pursuant to Article 15(1) RPBA. In particular, it raised objections under Articles 84 and 56 EPC 1973, mainly having regard to prior-art document D1.

IV. With a letter of reply dated 11 November 2014, i.e. one day before the scheduled oral proceedings, the appellant submitted amended claims according to eight auxiliary requests.

V. Oral proceedings were held on 12 November 2014, during which the appellant filed a new auxiliary request as

"Auxiliary Request 4A". The admissibility and allowability of all the pending requests were discussed.

The appellant's final request was that the decision under appeal be set aside and that a patent be granted on the basis of the claims according to a main request or one of first, second and third auxiliary requests, all submitted with the statement setting out the grounds of appeal, or auxiliary requests A, 1A, 2A, 3A, B, 1B, 2B and 3B, all filed with letter dated 11 November 2014, or auxiliary request 4A submitted at the oral proceedings before the board.

At the end of the oral proceedings, the decision of the board was announced.

VI. Independent claim 3 of the **main request** reads as follows:

"A wireless communication method of a wireless base station that performs transmitting data to mobile terminals in accordance with OFDM communication in frames of predetermined duration in which data for mobile terminals is mapped in accordance with a transmission schedule for each frame and common pilots are transmitted to the mobile terminals for estimating a channel, comprising the steps of:

generating repeatedly a frame pattern having a first frame and a second frame each of said predetermined duration and in which a number of common pilots in each is different, or in which a number of distributions of common pilots in each is different;

storing transmission data for each of the mobile terminals in a buffer; receiving reception quality measurement results of the mobile terminals;

dividing said mobile terminals into a first terminal group and a second terminal group and performing transmission scheduling for at least one group based on the reception quality measurement results of the mobile terminals;

selecting the transmission data for each mobile terminal of the first terminal group from the buffer and mapping the selected data in the first frame of said frame pattern based upon the result of the transmission scheduling, and further selecting the transmission data for each mobile terminal of the second terminal group from the buffer and mapping the selected data in the second frame of said frame pattern based upon the result of the transmission scheduling; and

transmitting said frame pattern in which data is mapped to the mobile terminals by an OFDM transmission unit."

Independent claim 3 of **auxiliary request 1** reads as follows (amendments compared with the main request have been underlined by the board):

"A wireless communication method of a wireless base station that performs transmitting data to mobile terminals in accordance with OFDM communication in frames of predetermined duration in which data for mobile terminals is mapped in accordance with a transmission schedule for each frame and common pilots are transmitted to the mobile terminals for estimating a channel, comprising the steps of:

generating repeatedly a frame pattern having a first frame and a second frame each <u>at a respective timing and</u> of said predetermined duration and in which a number of common pilots in each is different, or in which a number of distributions of common pilots in

each is different;

storing transmission data for each of the mobile terminals in a buffer; receiving reception quality measurement results of the mobile terminals;

dividing said mobile terminals into a first terminal group and a second terminal group and performing transmission scheduling for at least one group based on the reception quality measurement results of the mobile terminals;

selecting, at the timing for the first frame, the transmission data for each mobile terminal of the first terminal group from the buffer and mapping the selected data in the first frame of said frame pattern based upon the result of the transmission scheduling, and selecting, at the timing for the second frame, the transmission data for each mobile terminal of the second terminal group from the buffer and mapping the selected data in the second frame of said frame pattern based upon the result of the transmission scheduling; and

transmitting said frame pattern in which data is mapped to the mobile terminals by an OFDM transmission unit."

Independent claim 3 of **auxiliary request 2** reads as follows (amendments compared with the main request have been underlined by the board):

"A wireless communication method of a wireless base station that performs transmitting data to mobile terminals in accordance with OFDM communication in frames of predetermined duration in which data for mobile terminals is mapped in accordance with a transmission schedule for each frame and common pilots are transmitted to the mobile terminals for estimating a channel, comprising the steps of:

generating repeatedly a frame pattern having one or more first frames and one or more second frames each of said predetermined duration and in which a number of common pilots in each is different, or in which a number of distributions of common pilots in each is different between the first and second frames;

storing transmission data for each of the mobile terminals in a buffer; receiving reception quality measurement results of the mobile terminals;

dividing said mobile terminals into a first terminal group and a second terminal group and performing transmission scheduling for at least one group based on the reception quality measurement results of the mobile terminals, the ratio of first frames to second frames in said frame pattern being controlled according to the ratio of mobile terminals in the first terminal group and second terminal group;

selecting the transmission data for each mobile terminal of the first terminal group from the buffer and mapping the selected data in the first frame of said frame pattern based upon the result of the transmission scheduling, and further selecting the transmission data for each mobile terminal of the second terminal group from the buffer and mapping the selected data in the second frame of said frame pattern based upon the result of the transmission scheduling; and

transmitting said frame pattern in which data is mapped to the mobile terminals by an OFDM transmission unit."

Independent claim 3 of **auxiliary request 3** reads as follows:

"A wireless communication method of a wireless base station that performs transmitting data with common

pilots for estimating a channel to mobile terminals in accordance with OFDM communication, comprising the steps of:

generating repeatedly a frame pattern having a combination of at least two types of frames including a first frame and a second frame both of a predetermined duration and arranges each type of frame in the time direction in a predetermined ratio in which the number of common pilots in the first frame is different from that in the second frame and the duration of the common pilots in the first frame is the same as that of the second frame, or a frame pattern having a combination of at least two types of frames including a first frame and a second frame both of a predetermined duration and arranges each type of frame in a predetermined number ratio in the time direction in which the number of distributions of common pilots and the duration of the common pilots in the first frame is different from that of the second frame; storing transmission data for each of the mobile terminals in a buffer; receiving reception quality measurement results of the mobile terminals;

dividing said mobile terminals into a first terminal group and a second terminal group and performing transmission scheduling for at least one group based on the reception quality measurement results of the mobile terminals;

selecting the transmission data for each mobile terminal of the first terminal group from the buffer and mapping the selected data in the first frame of said frame pattern based upon the result of the transmission scheduling, and further selecting the transmission data for each mobile terminal of the second terminal group from the buffer and mapping the selected data in the second frame of said frame pattern based upon the result of the transmission scheduling;

and

transmitting said frame pattern in which data is mapped to the mobile terminals by an OFDM transmission unit."

Claim 3 of **auxiliary requests A, 1A, 2A and 3A** comprises all the features of claim 3 of the main request, auxiliary request 1, auxiliary request 2 and auxiliary request 3 respectively, with the only difference that the phrase "number of distributions of common pilots" has been replaced by the phrase "number of common pilot placing locations".

Claim 3 of **auxiliary request 4A** comprises all the features of claim 3 of auxiliary request 3A, with the only difference that the phrase "or a frame pattern having a combination of at least two types of frames including a first frame and a second frame both of a predetermined duration and arranges each type of frame in a predetermined number ratio in the time direction in which the number of distributions of common pilots and the duration of the common pilots in the first frame is different from that of the second frame" has been deleted.

Claim 3 of **auxiliary requests B, 1B, 2B and 3B** comprises all the features of claim 3 of auxiliary requests A, 1A, 2A and 3A respectively, with an addition to the dividing step such that the dividing step now reads (amendment has been underlined by the board):

"dividing said mobile terminals into a first terminal group and a second terminal group and performing transmission scheduling <u>to determine mobile terminals to which the transmission data is</u>

sent for at least one group based on the reception quality measurement results of the mobile terminals".

Reasons for the Decision

2. The appeal is admissible.

3. MAIN AND AUXILIARY REQUESTS 1 TO 3

3.1 Article 84 EPC 1973

As to independent claims 1, 3, and 4 of these requests, the board finds that the expression "number of distributions of common pilots" included in those claims is unclear to the skilled reader, since - even when considering the context and the teaching of the present application (particularly Figs. 1(A), 1(B) and 3) - it is not clear to what the "number of distributions of common pilots" actually refers with respect to the frame structures as defined by the claims. In particular, contrary to the view taken by the appellant at the oral proceedings, it is unclear whether the above phrase refers e.g. to the number of pilot placing *locations* or to the number of data units *between* separated pilot symbols or anything else.

3.2 In view of the above, the main request and auxiliary requests 1 to 3 are not allowable under Article 84 EPC 1973.

4. AUXILIARY REQUESTS A, 1A, 2A and 3A

Even though these auxiliary requests were submitted only one day ahead of the oral proceedings before the

board (cf. point IV above), the board admitted them into the appeal proceedings in the exercise of its discretionary power under Article 13(1) RPBA because it considered those requests to be a legitimate and successful reaction to overcome the objection raised under Article 84 EPC 1973 (cf. point 3.1 above) by replacing the expression "number of distributions of common pilots" with the phrase "number of common pilot placing locations".

4.1 Article 52(1) EPC: Novelty and inventive step

In the board's judgment, independent claim 3 of auxiliary requests A, 1A, 2A and 3A does not meet the requirements of Article 52(1) EPC, for the following reasons:

4.1.1 The board concurs with the finding of the decision under appeal to regard D1 as the closest prior art for the subject-matter claimed. Like the present invention, D1 is related to the use of variable common pilot patterns in OFDM-based wireless communication systems where a low density of common pilot symbols in the underlying time-frequency space is assigned to a mobile user experimenting a slowly varying communication channel, whilst a high density of common pilot symbols is assigned to a mobile user experimenting a fast varying channel to perform a reliable channel estimation. In particular, D1 discloses the following features of independent claim 3 of auxiliary request A in its phraseology:

A wireless communication method of a wireless base station ("base station 20") that performs transmitting data to mobile terminals ("mobile stations 30A, 30B") in accordance with OFDM communication in which data for

mobile terminals is mapped in accordance with a transmission schedule and common pilots are transmitted to the mobile terminals for estimating a channel (see e.g. paragraphs [0012] and [0013] in conjunction with Figs. 1 and 2A), comprising the steps of:

a) generating repeatedly a pattern ("pilot configurations") having a first and a second data unit (e.g. "resource sub-space 108A"; "resource sub-space 108B") in which a number of common pilots or a number of common pilot placing locations is different (see e.g. paragraph [0028] in conjunction with Figs. 5A and 5B);

b) storing transmission data for each of the mobile terminals in a buffer (inherently comprised in a typical OFDM transmitter as used in D1);

c) receiving reception quality measurement results of the mobile terminals (see e.g. column 9, lines 23-26 in conjunction with Figs. 7A and 7B, step 204);

d) dividing said mobile terminals into a first terminal group ("users with fast varying radio conditions") and a second terminal group ("users with slowly varying radio conditions") (see e.g. column 7, lines 14-18);

e) performing transmission scheduling for these groups based on the reception quality measurement result of the mobile terminals (see e.g. column 6, lines 45-48; Figs. 7A and 7B, step 207);

f) selecting the transmission data for each mobile terminal of the first/second terminal group from the buffer and mapping the selected data in the first/second data unit of said pattern based upon the result of the transmission scheduling (see e.g. column 9, lines 37-42: "... The estimated radio conditions are forwarded to the pilot manager 26, which performs the actual selection

and/or adjustment of resource sub-spaces ... provides access to the use of the different pilot configurations ...");

g) transmitting said pattern in which data is mapped to the mobile terminals by an OFDM transmission unit (see e.g. column 4, lines 25-26).

As to features b) and f), the examining division held that D1 did not anticipate a buffer which stored the transmission data for each of the mobile terminals (cf. appealed decision, page 8, section 4). However, the board considers that pre-storing OFDM data in a buffer prior to mapping and transmitting that OFDM data (i.e. transmitting the respective OFDM symbols at a certain OFDM sub-carrier frequency) is inherently performed in a typical OFDM transmitter as deployed in D1.

4.1.2 Hence, the only difference between the subject-matter of independent claim 3 of auxiliary request A and the disclosure of D1 is considered to be that the first and second data units are frames of a predetermined duration (called "low-speed frames" and "high-speed frames" in the application's description). Accordingly, the subject-matter of claim 3 of auxiliary request A is held to be novel over D1.

In the board's judgment, the technical effect achieved by the above distinguishing feature consists in that it enables synchronised and thus reliable OFDM transmissions. Based on this, the board regards the objective problem to be solved by independent claim 3 as being "how to transmit data units, selected at the *physical* layer according to D1, at the *data-link* layer of a typical OFDM system". This formulation was not contested by the appellant at the oral proceedings

before the board.

4.1.3 When starting out from D1 and the above objective problem, the board considers that the skilled person would be aware that multi-carrier wireless systems (e.g. OFDM systems) as addressed in D1 (see e.g. D1, paragraphs [0001] and [0013]) typically employ data frames of a fixed duration in the time dimension, i.e. OFDM frames made up of a certain number of OFDM symbols. Therefore, the skilled person would be faced with the task of defining OFDM frames with a certain duration in the time dimension such as typically 32 OFDM symbols (see also Fig. 30 of the application as filed). In this regard, it is apparent to the board that D1 (see e.g. paragraph [0024] in conjunction with Figs. 5A, 5B and 6) shows a grid of basic physical resources (i.e. time and frequency) involving certain resource sub-spaces generally available for OFDM transmissions. These resource sub-spaces have in turn different, dense or dispersed pilot patterns in the time and frequency dimensions and are allocated to mobile terminals associated with different moving conditions (see e.g. D1, paragraph [0028]). D1 also provides hints towards building up frames with different pilot patterns at a certain OFDM sub-carrier frequency (see e.g. Fig. 5B, pilot transmission pattern depicted at the fourteenth sub-carrier frequency, counted from the bottom of the diagram, combining resource sub-spaces 108C and 108F or Fig. 6, pilot patterns of the fourteenth or seventeenth sub-carrier frequency determined by resource sub-spaces 108E and 108C).

Consequently, the board concludes that the skilled person in the field of wireless telecommunication systems would take up those teachings and hints to

arrive at the solution defined in independent claim 3 of auxiliary request A.

4.1.4 The appellant contended that D1 did not disclose the use of schedulers and mappers which would arrange the frame pattern in the two ways claimed (cf. statement setting out the grounds of appeal, page 2, fifth to ninth paragraph). It is however apparent to the board that D1 shows that the resource parts of the grid of basic physical resources (i.e. time and frequency) to be used for OFDM transmissions have different numbers of pilots or distinct pilot locations in the time dimension at a certain sub-carrier frequency (see e.g. Figs. 5A, 5B and 6).

Moreover, the appellant argued that D1 did not provide any hint that different pilot structures might be used in corresponding repetitive frames of the same duration (cf. statement setting out the grounds of appeal, page 3, last paragraph). In this context, the board concedes that OFDM frames are not expressly disclosed in D1, as indicated in point 4.1.2 above, but notes that D1 also teaches that the pilot patterns may be recurring periodically with some period (see D1, column 6, lines 23-25).

Furthermore, the appellant argued at the oral proceedings before the board that the skilled person could not derive from the teaching of D1, notably from Figs. 2A, 5A and 6, the actual type of a frame structure, since he or she would be faced with a too abstract and flexible pilot configuration pattern entailing too many pilot constellations for the skilled person to form frames out of them. More specifically, based on the pilot patterns of Figs. 2A, 5A and 6 of D1, i.e. resource sub-spaces 108A to 108F, the skilled

person would at best infer therefrom either (i) that all the pilot patterns shown are accommodated within one frame or (ii) that each individual pilot pattern is accommodated by a single associated frame, rather than employing two different frames for two different pilot patterns as claimed. Moreover, D1 was not related to an OFDMA system combined with a time-division multiple access (TDMA) scheme, in contrast to the present invention.

In this respect, the board holds that the skilled person would consider none of options (i) and (ii), since both options would cause severe synchronisation problems at the receiver side due to the distinct time durations of the respective pilot patterns (see e.g. Fig. 6 showing resource sub-spaces 108A to 108F with durations of 10, 15, 16, 17 and 11 time slots). Rather, the skilled person would select suitable pilot patterns out of the available ones, i.e. resource sub-spaces 108A to 108F in D1, and then define conventional OFDM frames (e.g. with a duration of 32 OFDM symbols) depending on the number of selected pilot patterns. Moreover, in the absence of any more specific and solid information as regards the combination of OFDMA with TDMA in the claims, the system of D1 relating to a multi-user multi-carrier OFDM system (see e.g. paragraph [0013]) and using different time slots (as demonstrated e.g. by the squares in the frequency-time diagrams of Figs. 2A, 2B, 5A, 5B and 6) clearly falls within the terms of the OFDM system as claimed. This is all the more so since independent claim 3 is silent on whether the OFDM frames defined are associated with any OFDM sub-carrier frequency, i.e. whether or not the frame structures apply to *all* the sub-carrier frequencies available or only to *specific* ones.

4.1.5 Independent claim 3 of auxiliary requests 1A, 2A and 3A, apart from minor re-wordings, further specifies that (emphasis added)

h) the first and second frames are generated and selected at their respective timings *(in the case of auxiliary request 1A)*;

i) the frame pattern has one or more first and second frames and the ratio of first to second frames in said frame pattern is controlled according to the ratio of mobile terminals in the first and second terminal groups *(in the case of auxiliary request 2A)*;

j) each type of frame of the frame pattern in the time direction is arranged in a predetermined ratio in which

the number of common pilots in the first frame is different from that in the second frame and the duration of the common pilots in the first frame is the same as that of the second frame **or**

the number of common pilot placing locations and the duration of the common pilots in the first frame is different from that of the second frame *(in the case of auxiliary request 3A)*.

Feature h) is based on page 24, last paragraph and page 25, lines 8-12, whilst feature i) is supported by page 13, last paragraph of the application as filed. Feature j) is based e.g. on Fig. 1(B) as regards its first option and Figs. 1(A) and 3 as regards the second option.

4.1.6 As to feature h), the board considers it to be inherently comprised in an OFDM system as disclosed in D1, since it is mandatory for an OFDM system to use different timings for different frames at a certain

frequency, otherwise data collisions would inevitably occur. Hence, feature h) is considered to be implicitly disclosed in D1 and therefore cannot render the subject-matter of claim 3 inventive. The appellant did not contest that conclusion at the oral proceedings before the board.

4.1.7 As to feature i), D1 teaches the use of a multitude of pilot configurations (see Figs. 5A, 5B and 6) on the basis of which different frames may be derived and the dynamic adaptation of the available pilot patterns constitutes a direct consequence of the goal of avoiding bandwidth wastage in the OFDM system under consideration (see e.g. the change of the pilot configurations of Fig. 5A to the pilot configurations of Fig. 5B in D1 according to user needs). The board also holds that feature i) does not interact with the distinguishing feature established in point 4.1.2 above in such a manner that it causes an overall synergistic effect, since the above distinguishing feature is related to the task of defining generic OFDM frames with a certain duration, whilst feature i) is related to the quantitative relationship between those frames. Thus, feature i) cannot contribute to an inventive step either.

4.1.8 As to feature j), apart from the fact that employing pilot symbols with different symbol durations in typical OFDM frames as suggested by the first option of feature j) (see point 4.1.5 above) makes little technical sense, the board cannot discern from the present claims or description that the resulting technical effect is any more than providing two different options to implement distinct pilot patterns as regards the first and second frames, possibly resulting in the same or different data transmission

rate for the low-speed and high-speed frames. Moreover, D1 teaches the use of a multitude of pilot patterns (see Figs. 5A to 6) having different numbers of common pilots and various pilot locations in the time dimension at specific OFDM sub-carrier frequencies (see Figs. 5A, 5B, 6) on the basis of which different OFDM frames may be defined. The board concludes therefrom that feature j) constitutes no more than one of several equally likely (and more or less technically sensible) alternatives to implement distinct pilot patterns at a frame level (regardless of the duration of those frames) from which the skilled person would choose, depending on practical constraints such as implementation complexity or sensitivity of the OFDM transceivers concerned.

The appellant argued that D1 failed to teach the kind of flexibility suggested by features i) and j), since D1 supported a fixed frame pattern and did not include any incentive to change that fixed pattern. In that respect, the board considers that this argument is likewise not persuasive as it contradicts the appellant's submission made in respect of auxiliary request A that D1 failed to provide any hint towards generating a frame pattern at all (cf. point 4.1.4 above).

4.1.9 In view of the foregoing, the subject-matter of independent claim 3 of the auxiliary requests in question does not involve an inventive step having regard to D1.

4.2 In conclusion, auxiliary requests A, 1A, 2A and 3A are not allowable under Article 56 EPC 1973.

5. AUXILIARY REQUESTS B, 1B, 2B and 3B

These requests differ from the above requests in that independent claims 1, 3 and 4 as amended further specify that

k) transmission scheduling is performed to determine mobile terminals to which the transmission data is sent for at least one group (emphasis added).

This amendment is supported e.g. by Fig. 16, step 102 of the application as filed.

5.1 *Admission into the appeal proceedings*

The claims of these auxiliary requests were filed for the first time with the appellant's letter of reply to the summons to oral proceedings before the board (cf. point IV above). The admissibility of requests filed after the appellant has submitted its statement setting out the grounds of appeal and after a board has arranged oral proceedings is, in principle, subject to Article 13(1) and (3) RPBA.

5.1.1 The board has decided not to admit these auxiliary requests into the appeal proceedings, in view of the following facts:

A) the auxiliary requests in question were filed only one day ahead of the oral proceedings before the board (cf. point IV above), i.e. at a very late stage of the appeal proceedings;
B) the amendment according to feature k) arises from the description and *prima facie* indicates merely the purpose of performing transmission scheduling (which is, moreover, already anticipated by D1;

see e.g. Figs. 1 and 9A implying that the data to be transmitted is intended for the mobile terminals).

5.1.2 The board concludes from fact B) that the auxiliary requests under consideration do not *prima facie* overcome the objections under Article 56 EPC 1973 raised by the board prior to and during the oral proceedings before the board, and thus are not clearly allowable.

5.2 In view of the above, the board did not admit auxiliary requests B, 1B, 2B and 3B into the appeal proceedings under Article 13(1) RPBA.

6. AUXILIARY REQUEST 4A

This request differs from auxiliary request 3A in that independent claims 1, 3 and 4 as amended no longer include the second option following "or" in feature j), so that this feature now merely reads

j') each type of frame of the frame pattern in the time direction is arranged in a predetermined ratio in which the number of common pilots in the first frame is *different* from that in the second frame and the duration of the common pilots in the first frame is the *same* as that of the second frame (emphasis added).

Feature j') is supported e.g. by Figs. 1(A) and 1(B) of the application as filed and was purportedly introduced to resolve the apparent discrepancy between the two options of previous feature j).

6.1 *Admission into the appeal proceedings*

The claims of this auxiliary request were filed for the first time during the oral proceedings before the board (cf. point V above). Its admissibility is thus likewise governed by Article 13(1) and (3) RPBA.

6.1.1 The board decided not to admit this auxiliary request into the appeal proceedings, in view of the following observations:

C) it was filed at a very late stage of the appeal proceedings;
D) the amendment according to feature j') does not further limit the underlying subject-matter in a convergent way.

6.1.2 It follows from observation D) that this auxiliary request also does not *prima facie* overcome the objections under Article 56 EPC 1973 raised by the board, in particular considering the reasoning given in point 4.1.8 above, and thus is also not clearly allowable.

6.2 Accordingly, the board likewise declined to admit auxiliary request 4A into the appeal proceedings under Article 13(1) RPBA.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chair:

K. Götz-Wein A. Ritzka

Decision electronically authenticated