

## Appeal decision

Appeal No. 2015-005914

Appellant                                      Fraunhofer-Gesellschaft zur Foerderung der angewandten  
Forschung e. V.

Patent Attorney                              OKADA, Masahiro

The case of appeal against the examiner's decision of refusal for Japanese Patent application No. 2011-546842, entitled "AUDIO ENCODER, AUDIO DECODER, ENCODED AUDIO INFORMATION, METHODS FOR ENCODING AND DECODING AUDIO SIGNAL AND COMPUTER PROGRAM" [International Publication No. WO2010/086373 published on August 5, 2010, National Publication of International Patent Application No. 2012-516462 published on July 19, 2012] has resulted in the following appeal decision.

### Conclusion

The appeal of the case was groundless.

### Reason

#### No. 1 History of the procedures

The present application was filed on January 28, 2010 (priority claim under the Paris Convention: January 28, 2009, the US) as an international filing date. A written amendment was submitted on July 5, 2013 in response to a notice of reasons for refusal dated December 25, 2012. A written amendment was submitted on March 19, 2014 in response to a notice of reasons for refusal dated September 10, 2013. An examiner's decision of refusal was issued on November 25, 2014. An appeal against the examiner's decision of refusal was made and a written amendment was submitted on March 31, 2015. A written amendment was submitted on June 21, 2016 in response to a notice of reasons for refusal by the body dated December 21, 2015.

#### No. 2 Details of Notice of reasons for refusal by the body dated December 21, 2015

The present application does not satisfy the requirements stipulated in Article 36(6)(ii) of the Patent Act due to deficiencies in the recitation of the Scope of Claims for patent in the following points.

## Note

### 1. Regarding Claim 1

Claim 1 includes, in l. 15 to l. 17, the following recitation, "The audio decoder is configured to use a dependency between a selection of a transition slope and a selection of a transform length or a correlation between window shapes of adjacent frames by use of the variable-codeword-length window information" (hereinafter referred to as "Matter specifying the invention A").

(1) However, the Specification includes, in [0074], the following description, "(omitted) The window selector 270 is configured to provide a window information 272 to the transformer/windower 254". Claim 2 includes the following recitation, "the window selector (270) is configured to ... in dependence on the window-slope-length information".

Therefore, the invention according to Claim 1 of the application is not clear.

(2) The Specification includes, in [0086], the following description, "To summarize the above, the window selector 270 is configured to evaluate the "window\_length" information of the previous frame and the "window\_length" information of the current frame in order to determine the window type associated with the current frame. In addition, the window selector 270 is configured selectively to take into consideration the "transform\_length" information of the current frame to determine the window type associated with the current frame based on the value of the "window\_length" information of the current frame."

Therefore, the invention according to Claim 1 of the application is not clear.

According to (1) and (2), amendment to the Matter specifying the invention A should be considered as follows: "The window selector (270) is configured to use a dependency between a selection of a transition slope and a selection of a transform length and a correlation between window shapes of adjacent frames by use of the variable-codeword-length window information".

### 2. Regarding Claim 9

(1) Claim 9 includes, in l. 9 to l. 11, the following recitation, "the window-based signal transformer (130) is configured to switch between a usage of windows having a longer transition slope (310, 312, 314, 316, 318) and windows having a shorter transition slope" (hereinafter referred to as "Matter specifying the invention B").

However, the Specification includes, in [0052], the following description, "The fourth window type 316 comprises a short left-sided window slope 316A (128 samples) and a short right-sided window slope 316B (128 samples)" and the Specification includes, in [0053], the following description, "the fifth window type 318 comprises a short left-sided window slope 318A and a short right-sided window slope 318B."

Therefore, the invention according to Claim 9 of the application is not clear.

Amendment to the Matter specifying the invention B should be considered as follows: "the window-based signal transformer (130) is configured to switch between a usage of windows having a longer transition slope and windows having a shorter transition slope (310, 312, 314, 316, 318)".

(2) Claim 9 includes, in l. 20 to l. 22, the following recitation, "The audio encoder is configured to use a dependency between a selection of a transition slope and a selection of a transform length or a correlation between window shapes of adjacent frames by use of the variable-length-codeword".

However, the Specification includes, in [0075], the following description, "The audio decoder 200 comprises, as another key component, the window selector 270, which is configured to evaluate the variable-codeword-length window information 224 in order to select a window for processing of a given portion of the time-frequency representation 242 associated with a given frame of the audio information". Accordingly, the window selector 270 of the audio decoder 200 is configured to evaluate variable-codeword-length window information 224, or to use a dependency between a selection of a transition slope and a selection of a transform length or a correlation between window shapes of adjacent frames by use of the variable-length-codeword.

Therefore, Claim 9 is an invention of "audio encoder", and a technical matter of an encoder specified by the recitation, "The audio encoder is configured to use a dependency between a selection of a transition slope and a selection of a transform length or a correlation between window shapes of adjacent frames by use of the variable-length-codeword", is unclear.

Thus, the invention according to Claim 9 of the application is not clear.

### 3. Regarding Claim 13

For the same reason as for Claim 9, the invention according to Claim 13 of the application is not clear.

### No. 3 The Invention

The inventions according to Claims 1, 9, and 13 of the application are recognized as follows as specified by the matters recited in Claims 1, 2, and 13 of the Scope of Claims of the written amendment dated June 21, 2016. The underlined parts are amended matters.

"[Claim 1]

An audio decoder (200) for providing decoded audio information (212) on the basis of encoded audio information (210), the audio decoder comprising:

a window-based signal transformer (250) configured to map a time-frequency representation (242) of the audio information, which is represented by the encoded audio information (210), to a time-domain representation (252) of the audio information,

wherein the window-based signal transformer is configured to select a window, out of a plurality of windows (310, 312, 314, 316, 318) comprising windows of different transition slopes (310A, 312A, 314A, 316A, 318A, 310B, 312B, 314B, 316B, 318B) and windows having associated therewith different transform lengths (310, 312, 314, 316, 318) using window information (272),

the audio decoder (200) comprises a window selector (270) configured to evaluate variable-codeword-length window information (224) in order to select a window for processing of a given portion of the time-frequency representation associated with a given frame of the audio information,

the audio decoder is configured to use a dependency between a selection of a transition slope and a selection of a transform length or a correlation between window shapes of adjacent frames by use of the variable-codeword-length window information."

"[Claim 9]

An audio encoder (100) for providing encoded audio information (192) on the basis of input audio information (110), the audio encoder (100) comprising:

a window-based signal transformer (130) configured to provide a sequence of audio signal parameters (132) on the basis of the plurality of windowed portions of the input audio information (110),

wherein the window-based signal transformer (130) is configured to adapt window types for obtaining the windowed portions of the input audio information in dependence on characteristics of the input audio information (110),

the window-based signal transformer (130) is configured to switch between a usage of windows having a longer transition slope and windows having a shorter

transition slope (310, 312, 314, 316, 318), and to also switch between a usage of windows having two or more different transform lengths,

the window-based signal transformer (130) is configured to determine a window type used for transforming a current portion of the input audio information depending on a window type used for transforming an audio content of a preceding portion of the input audio information and the current portion of the input audio information,

the audio encoder is configured to encode window information (140) representing a type of window used for transforming the current portion of the input audio information (110) using a variable-length-codeword, and

the audio encoder is configured to use a dependency between a selection of a transition slope and a selection of a transform length or a correlation between window shapes of adjacent frames by use of the variable-length-codeword."

"[Claim 13]

A method (1100) for providing encoded audio information on the basis of input audio information, the method comprising:

a step (1110) of providing a sequence of audio signal parameters on the basis of a plurality of windowed portions of the input audio information, wherein a switching is performed between a usage of windows having a longer transition slope and windows having a shorter transition slope, and also between a usage of windows having associated therewith two or more different transform lengths, to adapt window types for obtaining the windowed portions of the input audio information depending on characteristics of the input audio information; and

a step of encoding information representing types of windows used for transforming portions of the input audio information using a variable-length-codeword,

the method (1100) being configured to use a dependency between a selection of a transition slope and a selection of a transform length or a correlation between window shapes of adjacent frames by use of the variable-length-codeword."

No. 4 Details of Written opinion dated June 21, 2016

(1) Regarding the Invention, the Chief Administrative Judge issued a notice of reasons for refusal that Claims 1, 9 and 13 have deficiencies in the recitation.

However, the applicant has an opinion that the current Claims 1, 9 and 13 should be permitted (but we can accept the indication 2. (1) regarding Claim 9 in the Reasons for refusal, and has amended in accordance with the indication in a written amendment together with this written opinion).

(2) (i) The opinion about why the term "or" in the last paragraph of the independent Claim 1 should be accepted is as follows.

It is specified that "The audio decoder is configured to use a dependency between a selection of a transition slope and a selection of a transform length or a correlation between window shapes of adjacent frames by use of the variable-codeword-length window information".

However, as shown in FIG. 6A, there is no need to take into consideration a correlation between window shapes of adjacent frames.

As shown in the field "transform\_length of the current frame", there are two cases labeled with "0 (or no transmission)". In fact, a case of transmitting "transform\_length of the current frame" with a value of "0" in the second and third cases (the rows labeled with "LONG\_START\_SEQUENCE" and "LPD\_START\_SEQUENCE") means that "window\_length of the previous frame" is not taken into consideration ("window\_length of the previous frame" equal to "0", or long window length of the previous frame, means that "transform\_length of the current frame" is equal to zero). In other words, as long as a correlation between window shapes of the previous frame is considered in any case, the transmission of the value "0" in the cases labeled with "LONG\_START\_SEQUENCE" and "LPD\_START\_SEQUENCE" may not occur (not necessary). Put still another way, the presence of "0" (or "no transmission") indicates that a correlation between window shapes of adjacent frames is not used, because variable word length window information is used in this example.

That is, when considering only the dependency between a selection of a transition slope and a selection of a transform length (without considering the correlation between window shapes of adjacent frames), there are some pieces of unnecessary information (The value "0" of "transform\_length of the current frame" shown for the cases "LONG\_START\_SEQUENCE" and "LPD\_START\_SEQUENCE"), while there remains a reduction of information to be transmitted in the cases of "ONLY\_LONG\_SEQUENCE" and "LONG\_STOP\_SEQUENCE". Therefore, it is reasonable to consider only the dependency between a selection of a transition slope and a selection of a transform length.

Thus, the matter of using both dependency between a selection of a transition slope and a selection of a transform length and correlation between window shapes of adjacent frames by use of variable word length window information is not a necessary feature.

Meanwhile, it is also reasonable to consider only the correlation between window shapes of adjacent frames by use of variable word length window information.

According to FIG. 6A, when the "Previous frame window\_length" is "0 (long window length)", it can be immediately determined that the "Current frame transform\_length" is long ("indicated by "0"), and there is no need to transmit the "Current frame transform\_length" from the audio encoder to the audio decoder. Thus, consideration of only the correlation between window shapes of adjacent frames (without considering the dependency between a selection of a transition slope and a selection of a transform length) results in saving of bits due to the use of variable word length window information.

Of course, if both approaches (a dependency between a selection of a transition slope and a selection of a transform length and a correlation between window shapes of adjacent frames) are simultaneously employed, maximum bit rate reduction can be achieved.

According to the approach and example of the invention, we consider that the term "and" at the end of Claim 1 is not necessary and the term "or" is appropriate.

(ii) We consider that the current recitation in Claim 9 and 13 is also appropriate. Especially, we ask for paying attention to use of a dependency between a selection of a transition slope and a selection of a transform length or a correlation between window shapes of adjacent frames by use of variable word length window information being also a function of an audio encoder and audio encoding.

For example, it is mentioned that FIG. 6A and FIGS. 7A, 7B, and 7C illustrate the inventive concepts for encoding the window type (see the first sentence in [0064] as of the filing of the application).

It is obvious for a person skilled in the art that encoding and decoding are based on the same idea, in providing and evaluating variable word length window information.

We hope that the Chief Administrative Judge accepts that a function does not need to be constrained by a specific dependent constituent component of the audio encoder (even though "variable word length encoding" is shown in FIG. 1B).

### (3) Summary

As described above, we consider that Claims 1, 9, and 13 of the Invention do not have deficiencies in recitation and the recitations can be permitted.

Therefore, we ask the Chief Administrative Judge to conduct deliberations again and render a decision that the invention shall be granted a patent.

### No. 5 Judgment by the body

Regarding the invention according to Claim 9, the notice of reasons for refusal (see "No. 2 2.(2)) was issued specifying that a technical matter of an encoder specified by the recitation in Claim 9 which is an invention of the audio encoder, "The audio decoder is configured to use a dependency between a selection of a transition slope and a selection of a transform length or a correlation between window shapes of adjacent frames by use of the variable-length-codeword", (hereinafter referred to as "Matter specifying the invention C") is unclear. However, no amendment was made in the written amendment dated June 21, 2016.

The Matter specifying the invention C of Claim 9 was added in the written amendment as of the demand for appeal, and it is mentioned that it is based on the Specification [0046]. However, the Specification [0046], which is a description about the configuration of the audio encoder, does not include a description regarding the Matter specifying the invention C.

Regarding the matter in the Matter specifying the invention C, "use a dependency between a selection of a transition slope and a selection of a transform length or a correlation between window shapes of adjacent frames", the Specification [0014] and [0015] includes the following descriptions: "For example, use of variable-codeword-length window information can exploit a dependency between a selection of a transition slope and a selection of a transform length" ([0014]); and "it should be noted that there is typically a correlation between window shapes of adjacent frames" ([0015]). The above descriptions, which indicate using variable-codeword-length



window information, can be recognized as a description about an audio decoder, and a technical matter of an audio encoder using a variable-length-codeword specified by the description is unclear.

The Appellant alleges in the written opinion dated June 21, 2016 as follows: "Regarding Claims 9 and 13, we consider that the current recitation is appropriate. Especially, we ask for paying attention to use of a dependency between a selection of a transition slope and a selection of a transform length and a correlation between window shapes of adjacent frames by use of variable word length window information being also a function of an audio encoder and audio encoding.

For example, it is mentioned that FIG. 6A and FIGS. 7A, 7B, and 7C illustrate the inventive concepts for encoding the window type (see the first sentence in [0064] as of the filing of the application).

It is obvious for a person skilled in the art that encoding and decoding are based on the same idea, in providing and evaluating variable word length window information."

However, FIG. 6A and FIGS. 7A, 7B, and 7C and the description of the first sentence in paragraph [0064] of the application do not include a description about the Matter specifying the invention C, and a technical matter of an audio encoder using a variable-length-codeword specified by the above is unclear. In addition, it cannot be recognized that the matters specifying the invention relating to an "audio decoder using a variable-codeword-length window information" and an "audio encoder using a variable-length-codeword" are obvious. Therefore, the above Appellant's allegation cannot be accepted.

The judgment on Claim 13 is the same as that on Claim 9.

Thus, the reasons for refusal by the body have not been resolved.

#### No. 6 Closing

As described above, the recitation of the Scope of Claims of the present application does not satisfy the requirements stipulated in Article 36(6)(ii) of the Patent Act.

Therefore, the appeal decision shall be made as described in the conclusion.

January 10, 2017

Chief administrative judge: SAKAI, Tomohiro  
Administrative judge: MORIKAWA, Yukitoshi  
Administrative judge: INOUE, Shinichi