

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year)

04 OCT 2018

Applicant's or agent's file reference
SCEA16278W00

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US 18/43555

International filing date (day/month/year)

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31 August 2017 (31.08.2017)

International Patent Classification (IPC) or both national classification and IPC

IPC(8) - H04N 21/80 (2018.01)

CPC - H04N 21/431, H04N 21/439

Applicant SONY INTERACTIVE ENTERTAINMENT INC.

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US
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Date of completion of this opinion

18 September 2018 (18.09.2018)

Authorized officer

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Box No. 1 Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:
- the international application in the language in which it was filed.
 - a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a)).
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of a sequence listing:
- a. forming part of the international application as filed:
 - in the form of an Annex C/ST.25 text file.
 - on paper or in the form of an image file.
 - b. furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. furnished subsequent to the international filing date for the purposes of international search only:
 - in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>2-6, 8-9, 11-18</u>	YES
	Claims	<u>1, 7, 10, 19-21</u>	NO
Inventive step (IS)	Claims	<u>5-6, 15-18</u>	YES
	Claims	<u>1-4, 7-14, 19-21</u>	NO
Industrial applicability (IA)	Claims	<u>1-21</u>	YES
	Claims	<u>None</u>	NO

2. Citations and explanations:

Claims 1, 7, 10, and 19-21 lack novelty under PCT Article 33(2) as being anticipated by US 8,560,331 B1 to Pereira et al. (hereinafter, 'Pereira').

As per claim 1, Pereira discloses a method for accelerated audio processing in a streaming environment ("In some embodiments, acceleration of the rate at which audio is presented is accomplished by skipping data. For example, to increase the presentation rate by one percent, one of every hundred audio samples can be ignored instead of being presented", col 7, ln 48-52); the method comprising: a. locating a position to ignore processing of an audio block of a streaming audio asset ("In some embodiments, acceleration of the rate at which audio is presented is accomplished by skipping data. For example, to increase the presentation rate by one percent, one of every hundred audio samples can be ignored instead of being presented", col 7, ln 48-52); b. ignoring the audio block chosen in a. (col 7, ln 48-65); c. compensating for the ignored audio block to generate compensated audio ("Methods for compensating for lost data packets and/or gaps, in which artificial audio data are generated, are optionally used to generate the transition data", col 7, ln 48-65); d. playing the compensated audio through an audio device ("Not including these audio data causes the audio stream to be presented in a shorter period of time.", col 7, ln 48-65).

As per claim 7, Pereira discloses the method of claim 1. Pereira further discloses receiving additional audio blocks in the streaming audio asset and repeating steps a. through d. at a predetermined interval ("store eight audio packets and a target is set to keep four audio packets in this buffer. When the number of packets in the receive buffer reaches six then acceleration is started and continues until the number of packets in the receive buffer again reaches four. If the number of packets in the receive buffer reaches seven or eight then the acceleration is increased by Audio Monitoring Logic 255.", col 13, ln 51-58).

As per claim 10, Pereira discloses the method of claim 1. Pereira further discloses wherein the ignored audio block in b) is less than 5ms long ("The total amount of acceleration achieved in Accelerate Step 340 can be greater than 0.2, 0.5, 1, 2, 3, 5, 10 or 15 percent. The amount of acceleration can be dependent on factors discussed elsewhere herein. If presentation of an audio stream is accelerated by 2 percent 100 milliseconds of audio data will be presented in approximately 98 milliseconds, etc.", col 11, ln 26-33).

As per claim 19, Pereira discloses the method of claim 1. Pereira further discloses wherein the audio device is a video game console ("For example, Audio Server System 210 can be configured to provide audio related to a plurality of different video games to different users.", col 5, ln 57-59).

As per claim 20, Pereira discloses a device, comprising: a CPU ("Processor 240 is an electronic and/or optical processor configured to execute logic, e.g. Software, included within the various components of Audio Server System 210 discussed herein.", col 5 ln 20-22); an audio device ("For example, Processor 240 may be programmed with software instructions in order to perform the functions of Audio Source 230, Game Server 225, and/or a I/O Device 235.", col 5, ln 20-25); a Memory coupled to the CPU ("Optional Storage 245 is typically a digital storage device Such as digital memory, static memory, random access memory, a hard drive, an optical drive, and/or the like.", col 4, ln 64-66); and non-transitory instructions embedded in memory which when executed cause the CPU to enact the method for accelerated processing of audio ("For example, Processor 240 may be programmed with software instructions in order to perform the functions of Audio Source 230, Game Server 225, and/or a I/O Device 235.", col 5, ln 20-25); comprising: a. locating a position to ignore processing of an audio block of the streaming audio asset ("In some embodiments, acceleration of the rate at which audio is presented is accomplished by skipping data. For example, to increase the presentation rate by one percent, one of every hundred audio samples can be ignored instead of being presented", col 7, ln 48-52); b. ignoring the audio block chosen in a (col 7, ln 48-65); c. compensating for the ignored audio block ("Methods for compensating for lost data packets and/or gaps, in which artificial audio data are generated, are optionally used to generate the transition data", col 7, ln 48-65); d. playing the compensated audio through the audio device ("Not including these audio data causes the audio stream to be presented in a shorter period of time.", col 7, ln 48-65).

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2 Citations and Explanations

As per claim 21, Pereira discloses a non-transitory computer-readable medium having embodied therein coded instructions executable by a computer processor ("Processor 240 is an electronic and/or optical processor configured to execute logic, e.g. Software, included within the various components of Audio Server System 210 discussed herein.", col 5 ln 20-22); the coded instructions being configured to implement a method for accelerated processing of audio ("In some embodiments, acceleration of the rate at which audio is presented is accomplished by skipping data. For example, to increase the presentation rate by one percent, one of every hundred audio samples can be ignored instead of being presented", col 7, ln 48-52); the method comprising: a. locating a position to ignore processing of an audio block of the streaming audio asset ("In some embodiments, acceleration of the rate at which audio is presented is accomplished by skipping data. For example, to increase the presentation rate by one percent, one of every hundred audio samples can be ignored instead of being presented", col 7, ln 48-52); b. ignoring the audio block chosen in b (col 7, ln 48-65); c. compensating for the ignored audio block ("Methods for compensating for lost data packets and/or gaps, in which artificial audio data are generated, are optionally used to generate the transition data", col 7, ln 48-65); d. playing the compensated audio on an audio device ("Not including these audio data causes the audio stream to be presented in a shorter period of time.", col 7, ln 48-65).

Claims 2, 8, 11-13 lack an inventive step under PCT Article 33(3) as being obvious over Pereira in view of US 6,009,386 A to Cruickshank et al. (hereinafter, 'Cruickshank').

As per claim 2, Pereira discloses the method of claim 1. However, Pereira does not disclose wherein a) includes I. deriving a transformation of the audio block; II. breaking the audio block transform into wavelets; and III. deriving the rate of change of the wavelets. However, Cruickshank does disclose wherein a. includes I. deriving a transformation of the audio block ("According to the present invention, there is provided a method of changing the playback Speed of a digitized time domain audio signal which has been transformed into a wavelet coded audio signal comprising a stream of frames...", col 1, ln 58-62); II. breaking the audio block transform into wavelets (col 1, ln 58-62); and III. deriving the rate of change of the wavelets ("A PCM Speech Signal is organised into consecutive blocks of samples. Each block is then filtered to obtain sub-blocks of filtered Samples with each Sub-block comprising frequency components of the original Signal which fall within a certain frequency band. Sub-blocks are then recoded using fewer bits, or dropped altogether to compress the Signal. In this regard, the Sub-bands representing higher frequency bands are the ones which may be dropped...", col 2, ln 62- col 3, ln 6). It would have been obvious to one of ordinary skill in the art to combine the method taught by Pereira with the locating taught by Cruickshank, since such would allow for discarding blocks that are likely to contain less pertinent audio signals.

As per claim 8, Pereira discloses the method from claim 1. However, Pereira does not disclose wherein locating a position at a) comprises determining whether the audio satisfies a threshold condition. However, Cruickshank does disclose wherein locating a position at a) comprises determining whether the audio satisfies a threshold condition ("A PCM Speech Signal is organised into consecutive blocks of samples. Each block is then filtered to obtain sub-blocks of filtered Samples with each Sub-block comprising frequency components of the original Signal which fall within a certain frequency band. Sub-blocks are then recoded using fewer bits, or dropped altogether to compress the Signal. In this regard, the Sub-bands representing higher frequency bands are the ones which may be dropped...", col 2, ln 62- col 3, ln 6). It would have been obvious to one of ordinary skill in the art to combine the method taught by Pereira with the locating taught by Cruickshank, since such would allow for discarding blocks that are likely to contain less pertinent audio signals.

As per claim 11, Pereira discloses the method of claim 1. However, Pereira does not disclose wherein compensating at d) comprises averaging an end of a prior audio block that is immediately before the ignored audio block with a beginning of the next audio block. However, Cruickshank does disclose averaging an end of a prior audio block that is immediately before the ignored audio block with a beginning of the next audio block ("In consequence of this, the FIR filters act to Smooth the discontinuities between frame #4 and frame #7 which resulted from dropping frames #5 and #6. More particularly, the filtering action of each of the Sub-band filters localizes the discontinuities between frames to only those frequency bands that contain active frequency components.", col 5, ln 27-33). It would have been obvious to one of ordinary skill in the art to combine the method taught by Pereira with the smoothing of the transition between one block and the next block taught by Cruickshank, since such would allow for ensuring a listener does not hear noticeable gaps between blocks.

As per claim 12, Pereira in view of Cruickshank discloses the method of claim 11. Cruickshank further discloses wherein the beginning of the next audio block is averaged with the end of the prior audio block ("In consequence of this, the FIR filters act to Smooth the discontinuities between frame #4 and frame #7 which resulted from dropping frames #5 and #6. More particularly, the filtering action of each of the Sub-band filters localizes the discontinuities between frames to only those frequency bands that contain active frequency components.", col 5, ln 27-33).

As per claim 13, Pereira in view of Cruickshank discloses the method of claim 11. However, Pereira in view of Cruickshank does not expressly disclose wherein an amount of the end of the prior audio block and the beginning of the next audio block that is averaged is between 0.005milliseconds (ms) and 0.06ms respectively. However, having an amount of the end of the prior audio block and the beginning of the next audio block that is averaged is between 0.005milliseconds (ms) and 0.06ms respectively could have been determined through routine experimentation. It would have been obvious to one of ordinary skill in the art to configure the method taught by Pereira and Cruickshank so that an amount of the end of the prior audio block and the beginning of the next audio block that is averaged is between 0.005milliseconds (ms) and 0.06ms respectively since such would allow for ensuring a listener does not hear noticeable gaps between blocks.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V.2 Citations and Explanations

Claim 9 lacks an inventive step under PCT Article 33(3) as being obvious over Pereira in view of US 7,130,528 B2 to Blair et al. (hereinafter, 'Blair').

As per claim 9, Pereira discloses the method from claim 1. However, Pereira does not disclose wherein locating a position at a) comprises determining whether the audio block is dependent on another audio block or data source. However, Blair does disclose wherein locating a position at a) comprises determining whether the audio block is dependent on another audio block or data source ("In any case, in step 216 a block of audio frames corresponding to the coded digital data retrieved from the storage medium can be selectively processed in accordance with the ratio of dropped, played and silenced TV frame intervals of audio data as calculated in step 214.", col 5, ln 11-15). It would have been obvious to one of ordinary skill in the art to combine the method taught by Pereira with the locating taught by Blair, since such would allow for determining if other data needs to be considered when ignoring certain audio blocks.

Claims 3-4 lack an inventive step under PCT Article 33(3) as being obvious over Pereira in view of Cruickshank and further in view of Blair.

As per claim 3, Pereira in view of Cruickshank discloses the method of claim 2. However, Pereira in view of Cruickshank does not disclose further comprising IV. flagging at least one audio block with a drop priority based on the rate of change of the wavelets. However, Blair does disclose further comprising IV. flagging at least one audio block with a drop priority based on the rate of change of the wavelets ("The selective processing can be performed by attaching an indicator flag or header to indicate the processing type determined in step 214. These indicating flags or headers are stripped off during the selective processing. Thus at Step 216 audio frames flagged or selected for dropping are deleted, or not read or extracted from the data stream.", col 5, ln 5-15). It would have been obvious to one of ordinary skill in the art to combine the method taught by Pereira and Cruickshank with the indicator taught by Blair, since such would allow for dropping the correct data.

As per claim 4, Pereira in view of Cruickshank and Blair discloses the method of claim 3. Blair further discloses wherein an audio block prior or after, the audio block flagged with a drop priority, is ignored ("In step 218, at least a portion of a remaining set of the audio frames are flagged for playback and silencing in accordance with the ratio determined in step 214. Further, in step 220 a selected portion of the frames designated or flagged for silence are muted.", col 5, ln 21-25).

Claim 14 lacks an inventive step under PCT Article 33(3) as being obvious over Pereira in view of Cruickshank and further in view of US 5,903,872 A (Fielder).

As per claim 14, Pereira in view of Cruickshank discloses the method of claim 11. However, Pereira in view of Cruickshank does not disclose wherein frequency analysis is applied to the audio block immediately before the ignored audio block to determine the amount of the end of the prior audio block to be averaged with the beginning of the next audio block. However, Fielder does disclose wherein frequency analysis is applied to the audio block immediately before the ignored audio block to determine the amount of the end of the prior audio block to be averaged with the beginning of the next audio block ("In coding Systems using a form of aliasing cancellation such as that provided by one of the TDAC transforms, splice edits prevent aliasing artifacts from being cancelled on each Side of the Splice for reasons that are discussed above. These uncancelled aliasing artifacts may be avoided by applying alternate filterbanks to the audio blocks at the start and end of each frame.", col 11, ln 18-40, col 13, ln 2-35). It would have been obvious to one of ordinary skill in the art to combine the method taught by Pereira and Cruickshank with the frequency analysis taught by Fielder, since such would allow for blending the audio blocks together accordingly.

Claims 5-6 and 15-18 meet the criteria set forth under PCT Article 33(2)-(3) because the prior art does not teach or fairly suggest the subject matter claimed.

The prior art is exemplified by: Pereira, Cruickshank and Fielder.

As per claim 5, Pereira and Cruickshank discloses the method of claim 3. However, Pereira and Cruickshank does not disclose establishing a sliding priority window and comparing the audio blocks within the sliding priority window to determine which block is flagged with highest drop priority, wherein the audio block with the highest drop priority is ignored in b) and wherein the drop priority describes the amount of change in the audio block.

Therefore the prior art of record does not teach or fairly suggest the subject matter claimed. Specifically, none of the prior art, alone or in combination, teaches or fairly suggests establishing a sliding priority window and comparing the audio blocks within the sliding priority window to determine which block is flagged with highest drop priority, wherein the audio block with the highest drop priority is ignored in b) and wherein the drop priority describes the amount of change in the audio block.

Therefore since the prior art of record does not disclose all of the elements of claim 5, claim 5 meets the criteria set out in PCT Article 33(2)-(3).

Claim 6 depends from claim 5, and, therefore, meet the criteria set out in PCT Article 33(2)-(3), as well.

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As per claim 15, Pereira in view of Cruickshank and Fielder discloses the method of claim 14. However, Pereira in view of Cruickshank does not disclose wherein the frequency next audio block is also analyzed to determine the amount of the beginning next audio block to be averaged with the end of the prior audio block.

Therefore the prior art of record does not teach nor fairly suggest the subject matter claimed. Specifically, none of the prior art, alone or in combination, teaches or fairly suggests the specific process of the frequency next audio block is also analyzed to determine the amount of the beginning next audio block to be averaged with the end of the prior audio block.

Therefore since the prior art of record does not disclose all of the elements of claim 15, claim 15 meets the criteria set out in PCT Article 33(2)-(3).

Claims 16-18 depend either directly or indirectly from claim 15, and, therefore, meet the criteria set out in PCT Article 33(2)-(3), as well.

Claims 1-21 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.