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**Solicitud de registro de patente de invención denominada
"UN APARATO Y UN MÉTODO PARA DECODIFICAR UNA
SEÑAL DE AUDIO CODIFICADA"**

**Solicitante: FRAUNHOFER-GESELLSCHAFT ZUR
FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E.V.**

Yo **Juanita Acosta Gómez**, identificada como aparece al pie de mi firma, y obrando en mi condición de apoderada de **FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E.V.**, solicitante de la patente en referencia, a continuación doy respuesta al Oficio **No. 6552** que fue notificado por fijación en lista el 16 de Abril de 2013.

1. Respecto a la materia que no es una invención (Art. 15, D 486, Literal (e))

El Examinador considera que:

Los objetos de las reivindicaciones 11 y 12 no se consideran una invención de acuerdo con el artículo 15 de la decisión 486 literal (e) debido a que "no hay una secuencia de etapas o sucesión de operaciones que inciden sobre una materia (sólida, líquida o gaseosa) que se encamina a la obtención de una cosa o un resultado" (Otero Lastres, José Manuel. Ob. Cit)1.

Para determinar si la solicitud que involucra un programa de computador puede ser considerada materia elegible a estudio de patentabilidad, se deben cumplir una serie de criterios los cuales aseguran que el proceso se limita a una aplicación práctica en particular.

En una primera evaluación se debe cumplir que: (1) la invención reivindicada, debe estar dirigida a una de las dos categorías legales aceptables según el artículo 14 de la Decisión 486: producto o procedimiento, y (2) la materia reclamada, no debe ser dirigida por completo a una excepción a la patentabilidad de las relacionadas en el artículo 15 de la Decisión 486.

En una segunda evaluación las reivindicaciones de procedimiento que involucre un programa de computador, como materia elegible para estudio de patentabilidad deben (1) estar vinculado a una determinada máquina, aparato o dispositivo, o (2) ser una transformación específica de un artículo determinado a un estado u objeto diferente. Se debe tener en cuenta que un método reclamado que no requiera la aplicación de una máquina o no cause una transformación específica de un artículo determinado a un estado u objeto diferente, no pasará la prueba y será rechazado.

Una "máquina" es algo concreto, que consta de partes, o de ciertos dispositivos, y la combinación de dispositivos. Esto incluye todos los dispositivos mecánicos o una combinación de fuerzas mecánicas y dispositivos para realizar alguna función y producir un efecto o resultado. Esta definición debe ser interpretada ampliamente, incluyendo el campo eléctrico, electrónica, óptica, acústica, y otros dispositivos que cumplen una función de lograr un resultado determinado.

La "máquina" debe implementar el proceso, es decir ser un elemento fundamental sin el que el proceso no podría realizarse y no ser un objeto secundario sobre el cual opera el proceso. Lo reclamado debe ser claro en cuanto a la máquina que implementa el proceso, y no afirmar simplemente "proceso implementado por una máquina". Las limitaciones de la máquina deben dejar claro que el uso de la máquina en el proceso reivindicado impone una limitación significativa en el alcance de la reclamación.

Por otra parte, la sola presencia de un vínculo con una máquina o con una transformación, no es suficiente para ser materia elegible a patentabilidad. Para que el procedimiento sea materia elegible a patentabilidad, dicho vínculo debe ser con una máquina en particular o con la transformación en particular de un artículo específico y cumplir con dos requisitos;

específico y cumplir con dos requisitos;

- En primer lugar, el uso de una máquina particular o la transformación de un artículo particular, debe definir un límite significativo para el alcance de la reclamación; por lo tanto, el hecho de tener una máquina vinculada a un único campo de actividad podría no ser suficiente.*
- En segundo lugar, la aplicación de la máquina particular o la transformación del objeto particular, debe implicar más que una actividad insignificante extra a la solución.*

Una máquina o aparato "particular" o transformación de un artículo "particular" significa que el método involucra una máquina o artículo específico, no cualquiera o todas las máquinas o artículos posibles.

Una actividad insignificante extra a la solución significa una actividad que no es fundamental para el objetivo del método propuesto por el solicitante. Por ejemplo, la recopilación de datos para aplicarse en un procedimiento, cuando todas las aplicaciones del procedimiento que requirieran alguna forma de recopilación de datos, no definieran un límite significativo en el alcance de la reivindicación.

En conclusión lo contenido en las reivindicaciones 11 y 12 no se considera una invención, dado que estas reivindicaciones reclaman un procedimiento que es considerado un programa de ordenador según la definición de la OMPI, expuesta en la decisión Andina 351 de 1993 artículo 3, que dice que un software es "un conjunto de instrucciones mediante palabras, códigos, planes o en cualquier otra forma que, al ser incorporadas en un dispositivo de lectura automatizada, es capaz de hacer que un ordenador -un aparato electrónico o similar capaz de elaborar informaciones-, ejecute determinada tarea u obtenga determinado resultado. El programa de ordenador comprende también la documentación técnica y los manuales de uso" y no puede ser considerada materia elegible a estudio de patentabilidad porque no cumple los requisitos mencionados con anterioridad. Inclusive la descripción recalca la independencia del método de la máquina y confirma su naturaleza de ser un programa de ordenador de la siguiente forma. "Generalmente, las formas de realización de la presente invención pueden implementarse como un producto de programa de computación con un código de programa, el código de programa es operativo para desarrollar uno de los métodos cuando el producto de programa de computación es utilizado en una computadora" (Fl.35).

Adicionalmente, el objeto de la reivindicación 13 no se considera una invención de acuerdo con el artículo 45 de la decisión 486 literal (f) debido a que reivindica una transmisión de audio la cual se considera una forma de presentar la información.

Adicionalmente, el objeto de la reivindicación 14 no se considera una invención de acuerdo con el artículo 45 de la decisión 486 literal (e) debido a que reivindica un programa de computación.

Con el fin de superar las objeciones realizadas por el Examinador se modificó el capítulo reivindicatorio. Las alteraciones efectuadas se justificarán individualmente a continuación:

Las reivindicaciones 13 y 14, que mencionan explícitamente un programa de computador y una transmisión de audio, respectivamente, fueron eliminadas de acuerdo a las instrucciones del Examinador.

De acuerdo a las reivindicaciones 13 y 14, se presenta a continuación la siguiente argumentación que evidencia las razones que justifican que las reivindicaciones deben ser sometidas a estudio de patentabilidad:

En el capítulo 6 de la GUÍA PARA EXAMEN DE SOLICITUDES DE PATENTE DE INVENCION Y MODELO DE UTILIDAD se proporcionan las instrucciones que el Examinador debe tomar como guía para determinar si la materia reclamada por el solicitante, que involucre un programa de computador, es elegible a estudio de patentabilidad.

Inicialmente la guía indica que el Examinador debe tener en cuenta que se deben cumplir los siguientes criterios:

“(1) La invención reivindicada, debe estar dirigida a una de las dos categorías legales aceptables según el artículo 14 D.486: Producto o Procedimiento.”

“(2) La materia reclamada, no debe ser dirigida por completo a una excepción a la patentabilidad de las relacionadas en el artículo 15 de la D.486.” (GUÍA PARA EXAMEN DE SOLICITUDES DE PATENTE DE INVENCION Y MODELO DE UTILIDAD, 2012, pág. 233)

Con respecto al cumplimiento del primer criterio la guía define un procedimiento de la siguiente manera:

“Procedimiento Método o proceso: *Es un acto o una serie de actos o pasos que están vinculados a una determinada máquina, aparato ó dispositivo, o a la transformación de un artículo en particular a un estado u objeto diferente.”* (GUÍA PARA EXAMEN DE SOLICITUDES DE PATENTE DE INVENCION Y MODELO DE UTILIDAD, 2012, pág. 234)

En la cita anterior se resalta la conjunción o, que indica que el proceso debe cumplir al menos **una** de las características de estar vinculado a una determinada máquina o a la transformación de un artículo en particular a un estado diferente.

En el caso de la reivindicación 11 la serie de pasos se encuentra definida claramente de la siguiente manera:

la decodificación de la primera porción (104a), la decodificación de la segunda porción (104b), desarrollar un algoritmo de ampliación de ancho de banda por medio de un módulo BWE (130), y controlar la frecuencia de cruce (f_x) para el módulo BWE (130) de acuerdo con la información del modo de codificación (108).

Mientras que en la reivindicación 12 la serie de pasos se encuentra definida claramente de la siguiente manera:

la codificación de acuerdo con un primer algoritmo de codificación, la codificación de acuerdo con un segundo algoritmo de codificación, la indicación del primer algoritmo de codificación, y el cálculo de parámetros BWE (106) para la señal de audio (105).

En el caso de necesitar una descripción más detallada el lector puede remitirse al capítulo descriptivo, en el cual se da una explicación clara de la importancia de seleccionar dichos pasos en los procesos para decodificar una señal de audio codificada, y codificar una señal de audio.

Ahora bien los métodos de las reivindicaciones 11 y 12 cumplen con la definición de método ya que las series de pasos están vinculados a la transformación de un artículo particular en particular a un estado u objeto diferente. Donde el artículo particular, que es en estos casos es la señal de audio codificada, y una señal de audio son transformadas en una señal de audio resultante y una señal de audio codificada, respectivamente. Aunque una señal de audio a primera vista puede no ser considerada como un artículo particular que pueda someterse a una transformación al no tener materia (sólida, líquida, o gaseosa), la guía del Examinador, en el capítulo 6.5, define lo siguiente:

La "**transformación**" de un artículo significa que el "artículo" ha cambiado a otro estado o a otro objeto. Cambiar a otro estado o a otro objeto por lo general, significa más que el simple uso de un artículo o cambiar la ubicación de un artículo. Una función o uso diferente, puede ser evidencia de que un artículo ha sido transformado. La manufactura y composiciones de la materia son el resultado de la transformación de materias primas en algo nuevo con una función o un uso diferente. (GUÍA PARA EXAMEN DE SOLICITUDES DE PATENTE DE INVENCION Y MODELO DE UTILIDAD, 2012, págs. 243-244)

Como una persona versada en la materia puede entender que las señales son la materia prima en el mundo de la electrónica, las señales de audio que entran a los métodos enunciados por las reivindicaciones 11 y 12, pueden considerarse como la materia prima de los métodos, y las señales de audio resultantes, que son la salida de los métodos, son algo nuevo con una función o aplicaciones diferentes. Por lo mencionado anteriormente los métodos en cuestión logran el cumplimiento del primer criterio citado anteriormente.

Adicionalmente el argumento anterior se reafirma con la siguiente cita de la guía del Examinador:

"Para los datos, la manipulación matemática por sí sola, no se considera como una transformación, pero, la transformación de datos electrónicos puede ser considerada cuando la naturaleza de los datos se ha cambiado de tal manera que tiene una función diferente o es adecuada para una aplicación diferente." (GUÍA PARA EXAMEN DE SOLICITUDES DE PATENTE DE INVENCION Y MODELO DE UTILIDAD, 2012, pág. 244)

Con respecto al segundo criterio que indica que la materia reclamada no debe ser dirigida por completo a una excepción a la patentabilidad de las relacionadas en el artículo 15 de la D.486., el Examinador está dirigido según la guía del Examinador a preguntarse: ¿Se puede considerar la materia reclamada una Aplicación Práctica?"

Como respuesta a la pregunta anterior se manifiesta que los métodos reclamados en las reivindicaciones 11 y 12 sí se limitan a una aplicación práctica, y pueden someterse a estudio, ya que son métodos correspondientes a procesos reales con aplicación industrial, que son la codificación y decodificación de una señal de audio.

Se reitera que la reivindicación no trata de reclamar una ley de la naturaleza ni un proceso mental, ya que al tener una aplicación real, se evidencia que la materia reclamada NO es abstracta.

Ahora bien, al haber aprobado los criterios anteriores es necesario cuestionarse si la materia reclamada está conectada con una transformación en particular de un artículo específico. A lo anterior, una persona versada en la materia entenderá que una señal de audio abarca una región específica del rango de todo el tipo de señales que existen en la electrónica, y que la codificación/decodificación de una señal de audio cumplen claramente con la característica de ser transformaciones particulares, efectuando la restricción enunciada.

Finalmente la transformación debe imponer un límite real en el procedimiento reivindicado, e igualmente debe implicar más que una actividad insignificante extra a la solución. A lo anterior se responde que la reivindicación en sí sólo puede llegar al resultado deseado (solución), llevando a cabo la serie de pasos que el Examinador cataloga como método con naturaleza de programa de computación, por ende la ejecución del programa en sí es el límite real del proceso reivindicado. Por ende, como la ejecución del método, con naturaleza de programa de computador, es el medio único para obtener el resultado deseado, no es una actividad insignificante extra a la solución.

Por todo lo anterior se concluye que las reivindicaciones 11 y 12 deben ser admitidas para estudio de patentabilidad. Adicionalmente se presenta a continuación, en la figura 1, el Diagrama M-T Para Determinar La Elegibilidad De Materia A Estudio De La Categoría De Procesos, que ayuda a expresar de manera gráfica las restricciones aprobadas por las reivindicaciones que las habilitan para ser estudiadas.

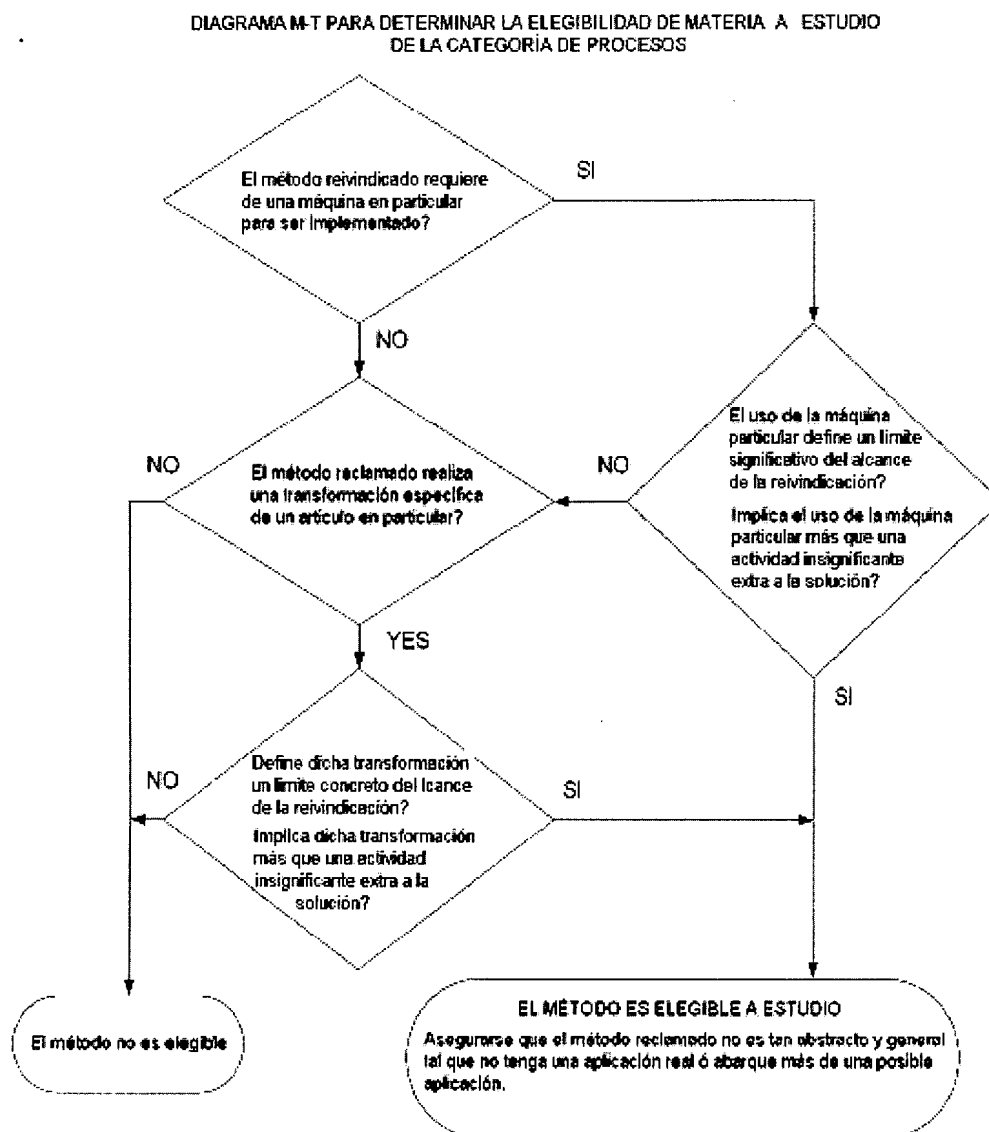


FIG. 1. Diagrama M-T Para Determinar La Elegibilidad De Materia A Estudio De La Categoría De Procesos

2. Respecto a las Objeciones a la Claridad y Concisión de las reivindicaciones (Art. 30 D486 y Art 22 PCT).

En el numeral 5 del oficio No. **6552**, se presentan las siguientes objeciones a la claridad de las reivindicaciones:

- Las reivindicación 1, 2, 6, 7 y 9 presentan los siguientes términos "... un primer decodificador...", "... un segundo decodificador...", "...un módulo PWE...", "...un controlador...", "...interfaz de entrada...", "...una etapa de decisión ...", "...un módulo de ampliación de ancho de banda...", "...interfaz de salida..." y "...codificador de tiempo..." los cuales son de carácter

- general que sugieren de forma imprecisa que la protección se extiende a otras posibles variaciones o modificaciones.*
- *Las reivindicaciones 1, 3, 4, 5, 6 y 9 no están caracterizadas por sus características esenciales sino por los resultados a alcanzar definidos por los términos "...configurado para desarrollar un algoritmo de ampliación de banda...", "...está configurado para utilizar un primera frecuencia de cruce...", "...configurado para conmutar entre la primera y Segunda porción de tiempo...", "...configurado para controlar el conmutador...", "...configurado para aumentar la frecuencia de cruce...", "...configurado para codificar de acuerdo a un primer algoritmo de codificación...", "...configurado para ser controlado por la etapa de decisión...", "...esta configurado para utilizar una primera frecuencia de cruce...", "...esta configurado para conmutar entre el primer y segundo codificador de tiempo..." y "...es operativa para analizar la señal de audio..." y en general los términos que caracterizan los elementos por los resultados a alcanzar. Es así que estas reivindicaciones no se pueden aceptar, ya que equivaldría a reivindicar todas las alternativas presentes o futuras que llevan al resultado a alcanzar.*
 - *La reivindicación 8 no es clara porque presenta un ancho de banda de frecuencias como características esenciales del aparato. Los anchos de banda de frecuencias al no ser tangibles no pueden hacer parte de las características estructurales de un aparato y por lo tanto un aparato no puede caracterizarse por tener anchos de banda de frecuencia.*
 - *La reivindicación 9 no es clara porque presenta el término "codificador de tiempo" que hace referencia a los codificadores de reivindicación independiente 6 pero la reivindicación 6 no se menciona que estos codificadores son de tiempo no concuerda la descripción de ambos codificadores. Dado que la reivindicación 9 se asume que los codificadores a los que se hace mención son los descritos en la reivindicación 6 la descripción debe concordar. Adicionalmente, se aclara que el término "codificador de tiempo" es de carácter general que sugiere de forma imprecisa que la protección de se extiende a posibles variaciones o modificaciones.*
 - *La reivindicación 6 no es clara porque presenta el término "...esta configurado fuera de la frecuencia de cruce variable..." que está mal traducido lo que cambia el significado de la solicitud PCT original.*

Con el fin de superar las objeciones presentadas con respecto a la claridad y concisión de las reivindicaciones, **es deseo del solicitante presentar un nuevo capítulo reivindicatorio compuesto por 12 reivindicaciones**, que encuentran su debido sustento en las reivindicaciones y la descripción originalmente presentadas, sin que ello conlleve ampliación de la invención.

A continuación se explicará cómo este nuevo capítulo reivindicatorio busca superar cada una de las objeciones de claridad expuestas previamente:

- Con respecto a las objeciones correspondientes a las reivindicaciones 1, 2, 6, 7 y 9, que presentan términos de carácter general, los cuales sugieren de forma imprecisa que la protección se extiende a otras posibles variaciones o modificaciones, no se está de acuerdo con el Examinador por las siguientes razones:

El lenguaje utilizado en las partes del aparato reclamado es natural en el área de la técnica tratada, y es necesario hacer claro que una persona versada en la materia entendería claramente que lo que se desea reclamar no es la utilización de las partes individuales por separado, sino la conexión específica de las mismas. Ahora bien, para un tercero que no conozca el alcance real de la invención, las partes como “un procesador” son demasiado generales, pero en el momento de ver de manera macroscópica la totalidad del aparato reclamado, se identifica que las partes tienen la especificidad necesaria y suficiente para que la protección se asigne solamente a la solución proporcionada por el solicitante, ya que dicha solución es única.

Normalmente, en ésta área del conocimiento técnico, se expresa la información y conformación de los dispositivos por medio de diagramas de bloques, tanto así que se ha vuelto un estándar global en el momento de realizar los dibujos de las publicaciones internacionales de aplicaciones para proteger propiedad intelectual; se entiende que el Examinador percibe que cada una de estas partes conflictivas está representado como uno de los bloques de los diagramas de bloques de las figuras de la aplicación, y que por esto son demasiado generales e imprecisos, pero cabe hacer la anotación de que la conexión única de todos los bloques hace que se pierda la generalidad que se aprecia al analizar los elementos por separado.

Cabe resaltar que los términos “generales” conflictivos de esta aplicación fueron aprobados en aplicaciones presentadas en Europa, pero para que haya suficiente claridad en que el lenguaje utilizado es el apropiado y

suficiente, inclusive bajo la legislación colombiana, en el Apéndice A, tablas A.1. – A.5., se presentan cinco ejemplos de patentes concedidas en Colombia, las cuales tienen el mismo lenguaje de abstracción acerca de las partes de un aparato que pueden intuirse como partes de un diagrama de bloques.

Para ser más precisos se muestra a continuación los términos afectados por generalidad en la aplicación, y posteriormente algunos de los términos encontrados en el Apéndice A:

Términos afectados en la aplicación:

“... un primer decodificador...”, “... un segundo decodificador...”, “...un módulo PWE...”, “...un controlador...”, “...interfaz de entrada...”, “...una etapa de decisión ...”, “...un módulo de ampliación de ancho de banda...”, “...interfaz de salida...” y “...codificador de tiempo...”

Términos encontrados en el apéndice A:

“componente de conexión”, “componente de medida”, “un procesador”, “sistema de circuitos de comunicación”, “una fuente de energía”, “una memoria”, “un controlador”, “un separador”, “un transformador”, “una parte de generación” y “un microcomputador”

El objetivo de la comparación no es sólo mencionar que ya han sido aprobados términos semejantes anteriormente, sino que el tipo de información es apropiada para describir las partes del aparato, y que se utiliza de manera usual.

Por lo presentado anteriormente se concluye que los términos no son demasiado generales para utilizarlos como partes, ya que la protección no se extenderá a otras posibles variaciones o modificaciones, debido a que la forma en que están conectados todos ellos garantiza una forma única de llegar a la solución del problema suministrada en la presente invención.

- Con respecto a las objeciones de las reivindicaciones 1, 3, 4, 5, 6 y 9, en las cuales el Examinador indica que se trata de caracterizar la invención por sus resultados a alcanzar, se modificaron las mismas según la indicación del examinador.

- De acuerdo a la reivindicación 8, que incluye un ancho de banda de frecuencia, se le aclara al examinador que no se trata de proteger una forma de presentar la información, sino que la característica conflictiva referente a los anchos de banda ayuda a definir una configuración interna del dispositivo.
- Con respecto a la reivindicación 9, que no sigue la misma terminología de la reivindicación 6, se eliminó el término conflictivo referente que los codificadores son de tiempo.
- Acerca de la reivindicación 6, que presenta una mala traducción, se reemplazó el término “fuera de” por “expulsa”.

3. Con respecto a la Determinación del Estado de la Técnica y al Examen de Patentabilidad

En los numerales 6, 7 y 8 del oficio citado, ese Despacho concluye que las reivindicaciones de la presente solicitud de patente carecen de novedad y nivel inventivo frente a las enseñanzas de los documentos **WO0241302 (D1)** y **US2005261892 (D2)**.

Novedad

El señor Examinador considera que la novedad de la presente invención, en la reivindicación 6, está afectada debido a que D1 revela algunas o todas las características esenciales de la invención. En este sentido, el Examinador presenta la siguiente comparación:

Características esenciales	D1
Un primer codificador	Codificador de núcleo que (Pág. 6, ln. 33 a 35).
Un segundo codificador	Codificador de envolventes HFR (Pág. 6, ln. 35 a 36).
Una etapa de decisión	Módulo de control de frecuencia (Pág. 3, ln. 10 a 14).
Un módulo de ampliación de ancho de banda	Codificador de núcleo que remueve la banda superior desde la frecuencia de cruce (Pág. 6, línea 38 y Pág. 7, línea 1) y codificador de envolventes HFR que solo codifica la banda superior desde la frecuencia de cruce (Pág. 6, ln. 35 a 36).

Aunque el Examinador haya citado el documento **WO0241302 (D1)** para objetar la novedad y la altura inventiva de la presente invención, es posible afirmar que este no enseña las características esenciales de la invención, como será demostrado a continuación.

El documento D1 provee un método y aparato para el mejoramiento de un sistema de codificación donde son usados métodos de reconstrucción a alta frecuencia (HFR). En este se parte del uso tradicional de una frecuencia de cruzada fijada entre la banda baja, donde se usan esquemas convencionales de codificación (como MPEG), y la banda alta, donde esquemas de codificación HFR son usados, por estimación continua y aplicación de la frecuencia de corte que permite el intercambio entre los artefactos introducidos por la codificación de banda baja y el sistema HFR. En el documento la elección puede estar basada en la medición de la dificultad de los grados de libertad de codificar una señal con un codificador de núcleo, una detección de solicitud de bit en tiempo corto, y un análisis de tonalidad espectral. La medición de la dificultad puede ser derivada de entropía perceptual, o de la distorsión de codificación psicoacústicamente relevante.

En vista de lo anterior se observa que el proceso de codificación del documento D1 no muestra un proceso de ampliación de ancho de banda como está evidenciado en una parte el aparato de la reivindicación 6 de la siguiente manera:

Un módulo de ampliación de ancho de banda (230) para calcular parámetros BWE (106) para la señal de audio (105), donde el módulo BWE (230) es controlado por la etapa de decisión (220) para calcular los parámetros BWE (106) para una banda que no incluye el primer ancho de banda de frecuencia en la primera porción (204a) de la señal de audio (105) y) para una banda que no incluye el segundo ancho de banda de frecuencia en la segunda porción (204b) de la señal de audio (105),

Adicionalmente en el documento D1 sólo se utiliza una frecuencia de cruce, mientras que en la invención se muestra el uso de dos frecuencias utilizadas para llevar a cabo la codificación. En la reivindicación 6 se muestran de la siguiente manera:

en donde el módulo BWE (230) utiliza una primera frecuencia de cruce (fx1) para calcular los parámetros BWE para una señal codificada que utiliza el primer codificador (210a) y utiliza una segunda frecuencia de cruce (fx2) para una señal

codificada que utiliza el segundo codificador (210b), en donde la primera frecuencia de cruce (fx1) es mayor que la segunda frecuencia de cruce (fx2).

Por lo anterior se concluye que no se puede observar de manera evidente del documento D1 todas las características presentadas por la reivindicación 6, de modo que ésta última sí es novedosa.

Nivel inventivo

El señor Examinador considera que la novedad de la presente invención, en la reivindicación 1, está afectada debido a que D1 revela algunas o todas las características esenciales de la invención. En este sentido, el Examinador presenta la siguiente comparación:

Características esenciales	D2	D1
Un primer codificador	Una porción del primer modo de codificación (Reiv 8)	No menciona
Un segundo codificador	Una porción del segundo modo de codificación (Reiv 8)	No menciona
Un módulo BWE	No menciona	decodificador de núcleo, decodificador de envoltantes HFR, Modulo de transposición (Pág. 7, ln 23 a 34) y Modulo de control de frecuencia (Pág. 3, ln. 10 a 14) que en conjunto recuperan una señal de ancho de banda (<i>wideband signal</i>)
Un controlador	No menciona	Módulo de control de frecuencia (Pág. 3, ln. 10 a 14) y Modulo de transposición (Pág. 7, ln 27 a 29)

Aunque el Examinador haya citado los documentos **WO0241302 (D1)** y **US2005261892 (D2)** para objetar el nivel inventivo de la presente invención, es posible afirmar que este no enseña las características esenciales de la invención, como será demostrado a continuación.

Los documentos D1 y D2 no dan a conocer las siguientes características ilustradas por la reivindicación 1 de la invención:

En donde el módulo BWE (130) utiliza una primera frecuencia de cruce ($fx1$) para la ampliación de ancho de banda para la primera señal decodificada (114a) y utilizar una segunda frecuencia de cruce ($fx2$) para la ampliación de ancho de banda para la segunda señal decodificada (114b), en donde la primera frecuencia de cruce ($fx1$) es mayor a la segunda frecuencia de cruce ($fx2$); y

un controlador (140) para controlar la frecuencia de cruce (fx) para el módulo BWE (130) de acuerdo con la información del modo de codificación (108).

Por las características anteriores se concluye que la reivindicación 1 cumple con los requerimientos de nivel inventivo frente a D1 y D2.

Con el fin de dar mayor claridad a los argumentos presentados anteriormente, se anexa el examen técnico realizado por la Oficina Europea de Patentes (EPO), en el cual se aprecia que la solicitud logra cumplir con novedad y nivel inventivo frente a los documentos WO02/41302, WO2008/031458 y US6134518, los cuales presentan información similar a los documentos citados por el examinador.

4. Conclusión

Las modificaciones realizadas a las reivindicaciones de la presente solicitud de patente y las aclaraciones presentadas a lo largo del presente escrito, permiten superar completamente las objeciones realizadas a la claridad de las reivindicaciones, por lo cual, la presente solicitud cumple a cabalidad las exigencias establecidas por el artículo 30 de la Decisión 486 y el artículo 22 del Tratado de Cooperación en Materia de Patentes PCT, según los requerimientos del examinador.

De otra parte, los argumentos expuestos en el numeral 4 del presente escrito, ponen de manifiesto de una manera clara y contundente, que lo revelado en las nuevas reivindicaciones de la presente solicitud, resulta completamente NOVEDOSO E INVENTIVO sobre las enseñanzas del estado del arte más cercano representado por los documentos D1 y D2, toda vez que nada dentro de dichos documentos revela en forma directa o al menos llega a sugerir un aparato y un método para decodificar una señal de audio codificada, descrito en la invención. Por consiguiente, no se puede derivar la inexistencia de los requisitos de ley para la concesión del privilegio de patentabilidad.

En consecuencia, me permito solicitar a ese Despacho, proceder con la revisión de las modificaciones y de los argumentos aquí presentados, para conceder el privilegio de patente solicitado para la materia objeto de las 12 reivindicaciones ahora presentadas en el capítulo reivindicatorio modificado, y que de subsistir alguna duda o inquietud con respecto a la patentabilidad de la presente invención, a pesar de las modificaciones y argumentos técnicos ahora presentados, sin apartarse del espíritu inventivo originalmente revelado en la solicitud internacional, se le brinde la oportunidad al solicitante de aclararla o de limitar aún más la invención, mediante la emisión de un segundo examen de fondo, teniendo en cuenta el nuevo capítulo reivindicatorio que se somete a revisión, antes de que se emita una decisión definitiva por parte de ese Despacho, de conformidad con lo dispuesto en 1.2.2.5.1 del artículo primero de la Resolución 54093 de 2012.

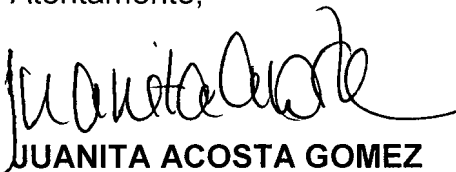
5. Anexos

- Capítulo reivindicatorio modificado, en donde se han llevado a cabo las modificaciones mencionadas anteriormente.
- Recibo de caja No. 13-0069606 por concepto de reivindicaciones adicionales.
- Anexo A. con tablas de ejemplos de aplicaciones precedentes.
- Examen técnico realizado por la oficina europea de patentes (EPO).

6. Petición

Solicito al Despacho que proceda a emitir un segundo examen de fondo sobre el nuevo capítulo reivindicatorio, en el evento en que el examinador considere que pese a las modificaciones presentadas, aún persisten las objeciones planteadas.

Atentamente,



JUANITA ACOSTA GOMEZ

C.C 52.618.636 de Bogotá

T.P. 79.686 C.S.J.

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ABM

P-544

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO DELEGATURA PARA LA PROPIEDAD INDUSTRIAL
DE NUEVAS CREACIONES. (MAYO de 2012). GUÍA PARA EXAMEN DE SOLICITUDES DE
PATENTE DE INVENCION Y MODELO DE UTILIDAD. BOGOTA D.C., COLOMBIA.

ANEXO A: Información de patentes de invención presentadas en Colombia.

TABLA A.1:

Expediente	10 147848	Fecha de solicitud	24/11/2010 17:28
Sector	INGENIERIA ELECTRICA	Clasificación Ipc	A46B 15/0 AC;
Datos Pct	-Inicio Fase nacional	07/12/2010	
	-Fecha presentación Internacional	07/05/2008	
	-Solicitud Internacional Nº	PCT/US2008/062864	
	-Publicación Internacional Nº	WO2009/136918	
	-Fecha publicación Internacional	12/11/2009	
Título	MÉTODO PARA DAR SALIDA DE SEÑALES DE AUDIO DESDE UN IMPLEMENTO DE CUIDADO ORAL DEPENDIENDO DE LA ORIENTACIÓN DE ESTE		
Solicitante(s)	COLGATE-PALMOLIVE COMPANY		
Inventor(es)	JOHN GATZEMEYER		
	EDUARDO JIMENEZ		
	ROBERT A. MOSKOVICH		
	KENNETH WAGUESPACK		
	JAMES KEMP		
	DOUGLAS HOHLBEIN		
	MARY HORCHOS		
	THOMAS MINTEL		
Gaceta	Numero	Fecha	NP
	626	22/03/2011	33
Estado	CONCESION 2013-03-18 16:08:32		
	<u>Etapas del Trámite</u>		
Resumen	Los aspectos de la presente invención permiten a una persona conocer cuando ella/él ha cepillado sus dientes por un periodo de tiempo mientras disfruta de un interludio de audio.		
	En un aspecto, un aparato incluye un componente de conexión configurado a conectar el aparato a cualquiera de una pluralidad de aparatos diferentes.		
	En otro aspecto, un cepillo de dientes incluye por lo menos un componente de medida configurado para medir un parámetro de uso del cepillo de dientes en una región de cuidado oral, y un procesador configurado para cambiar la salida de una primera señal de audio de una pluralidad de señales de audio a una segunda señal de audio de una pluralidad de señales de audio, basado en el parámetro de medición.		
	En otro aspecto, un cepillo de dientes incluye un procesador configurado para recibir los primeros datos de una fuente externa y dar salida a los segundos datos correspondientes a los primeros datos recibidos para por lo menos un dispositivo de salida; el por lo menos dispositivo de salida está configurado para dar salida a los segundos datos del procesador.		
	Aquí se discuten una variedad de configuraciones de diferentes módulos de audio de salida y cepillos de		

	dientes, cada uno creando un ambiente agradable durante el cepillado de los dientes. Estas configuraciones proporcionan una mejora ventajosa para la higiene oral para niños y adolescentes.

TABLA A.1. MÉTODO PARA DAR SALIDA DE SEÑALES DE AUDIO DESDE UN IMPLEMENTO DE CUIDADO ORAL DEPENDIENDO DE LA ORIENTACIÓN DE ESTE. (SIC, MÉTODO PARA DAR SALIDA DE SEÑALES DE AUDIO DESDE UN IMPLEMENTO DE CUIDADO ORAL DEPENDIENDO DE LA ORIENTACIÓN DE ESTE)

TABLA A.2.

Expediente	10 89251	Fecha de solicitud	22/07/2010 14:49
Sector	INGENIERIA ELECTRICA	Clasificación lpc	G5D 5/0 AC;
Título	IMPLANTE PARA LA RECOPIACIÓN DE DATOS CON UN SENSOR CON CAPACIDAD DE GENERAR DATOS DE SALIDA EN RESPUESTA AL IMPLANTE QUE RECIBE SEÑAL DE INTERROGACIÓN Y MÉTODO PARA CALIBRAR DICHO IMPLANTE		
Solicitante(s)	CODMAN NEURO SCIENCES SARL		
Inventor(es)	ROCCO CRIVELLI		
	DANILLO ROTH		
	ALEC GINGGEN		
Gaceta	Numero	Fecha	NP
	628	20/05/2011	75
Estado	CONCESION 2013-02-25 17:09:40		
	Etapas del Trámite		
Resumen			
	Un implante incluye un procesador, un sistema de circuitos de comunicación por RF, un sistema de circuitos de comunicación óptica, una fuente de energía y una memoria, todos sellados herméticamente dentro de un alojamiento con una ventana transparente. Las lecturas del sensor se transmiten por RF con el uso del sistema de circuitos de comunicación por RF hacia un lector remoto después de recibir las señales de interrogación del lector. Durante la calibración del sensor, se calculan los coeficientes correctivos mediante la comparación de las lecturas reales de la presión del sensor con lecturas de presión conocidas. Los coeficientes correctivos se transmiten a la memoria del sistema de circuitos de control con el uso de comunicación óptica, en donde la luz modulada se transmite a través de la ventana transparente del alojamiento al fotodetector.		

TABLA A.2. IMPLANTE PARA LA RECOPIACIÓN DE DATOS CON UN SENSOR CON CAPACIDAD DE GENERAR DATOS DE SALIDA EN RESPUESTA AL IMPLANTE QUE RECIBE SEÑAL DE INTERROGACIÓN Y MÉTODO PARA CALIBRAR DICHO IMPLANTE. (SIC, IMPLANTE PARA LA RECOPIACIÓN DE DATOS CON UN SENSOR CON CAPACIDAD DE GENERAR DATOS DE SALIDA EN RESPUESTA AL IMPLANTE QUE RECIBE SEÑAL DE INTERROGACIÓN Y MÉTODO PARA CALIBRAR DICHO IMPLANTE)

TABLA A.3.

Expediente	97 3703	Fecha de solicitud	27/01/1997 17:02
Sector	INGENIERIA ELECTRICA	Clasificación Ipc	H1L 29/0 ;
Certificado	26693	Tipo concesión	TOTAL
Vigencia desde	27/01/1997	Hasta	27/01/2017
Título	VALVULA ELECTRONICA CONTROLABLE DE BAJA DISIPACION, UN CONTROLADOR DE ENERGIA Y METODO PARA CONTROLAR LA ENERGIA SUMINISTRADA A UNA CARGA		
Dueño(s)	BENSYS CORP.		
Inventor(es)	ACATRINEI BENIAMIN		
Gaceta	Numero	Fecha	NP
	460	08/05/1998	716
Estado	CADUCADO 2007-06-08 14:48:30		
	Etapas del Trámite		
Resumen	1.- Una válvula electrónica controlable para controlar una		
	energía suministrada a un circuito de carga en respuesta a una fuente de potencia de entrada, comprende:		
	un controlador de potencia para controlar un voltaje a través de dicho circuito de carga, una corriente de entrada que se introduce en dicho controlador de potencia a través de un electrodo de voltaje de entrada (V entrada) dicha corriente de entrada se genera por dicha fuente de potencia de entrada, dicha corriente de entrada incluye una corriente de carga y una corriente interna (I interna) dicha corriente de carga sale por dicho controlador de potencia hacia dicho circuito de carga, I interna es la salida a través de la salida conmutada;		
	un controlador de corriente para mantener I interna en un valor constante, dicho controlador de corriente tiene una salida acoplada a una tierra, tiene una entrada, y tiene al menos un electrodo de control de corriente;		
	un controlador de umbral de voltaje para suministrar una corriente umbral, dicho controlador de umbral de voltaje tiene al menos una entrada y al menos una salida; y		
	un separador de corriente para controlar el pasaje de I interna y dicha corriente umbral a dicha fuente de corriente constante, una primera entrada de dicho separador de corriente está acoplado con dicha salida conmutada de dicho controlador de potencia, una segunda entrada de dicho separador de corriente está acoplada con dicha salida de dicho controlador de umbral de voltaje, dicha salida de dicho separador de corriente está acoplada con dicha entrada de dicho controlador de corriente.		

TABLA A.3. VALVULA ELECTRONICA CONTROLABLE DE BAJA DISIPACION, UN CONTROLADOR DE ENERGIA Y METODO PARA CONTROLAR LA ENERGIA SUMINISTRADA A UNA CARGA. (SIC, VALVULA ELECTRONICA CONTROLABLE DE BAJA DISIPACION, UN CONTROLADOR DE ENERGIA Y METODO PARA CONTROLAR LA ENERGIA SUMINISTRADA A UNA CARGA)

TABLA A.4.

Expediente	10 140782	Fecha de solicitud	10/11/2010 13:49						
Sector	INGENIERIA ELECTRICA	Clasificación lpc	G5D 23/19 AC;						
Datos Pct	-Inicio Fase nacional	27/04/2011							
	-Fecha presentación Internacional	08/09/2009							
	-Solicitud Internacional Nº	PCT/KR2009/005066							
	-Publicación Internacional Nº	WO2010/035967							
	-Fecha publicación Internacional	01/04/2010							
Título	CONTROLADOR DE TEMPERATURA QUE TIENE CONTROL DE FASE Y FUNCION DE CONTROL DE CICLO CRUZADO CERO								
Solicitante(s)	AUTONICS CORPORATION								
Inventor(es)	HWAN-KI PARK								
Gaceta	Numero	Fecha		NP					
	632	20/09/2011		1181					
Estado	CONCESION 2013-06-27 10:41:47								
	<u>Etapas del Trámite</u>								
Resumen	La presente invención se relaciona con un controlador de temperatura que tiene control de fase y función de control de ciclo cruzado cero que se puede conseguir a un costo bajo, controlando la potencia que se suministra a una carga, mediante la generación de una señal de control de fase o una señal de control cruzado cero, de acuerdo con la temperatura objetivo de control de una carga, utilizando un microcomputador.								
	Una implementación ejemplar de la presente invención proporciona un controlador de temperatura que tiene control de fase y función de control de ciclo cruzado cero, que controla una carga a una temperatura objetivo preestablecida, mediante el funcionamiento del control de fase o del control cruzado cero sobre la potencia suministrada a la carga, después de detectar y analizar la temperatura de la carga con un sensor de temperatura, el cual incluye: una parte del circuito de sincronización de la fuente de potencia que saca una señal de sincronización proveniente de una potencia AC; una parte del circuito de potencia en la cual una fuente de potencia AC se conecta con una primera bobina de un transformador, y una parte de generación de potencia de conducción y una parte de generación de potencia de activación del triac se acondicionan respectivamente sobre una segunda bobina; un microcomputador que genera una señal de control de fase o una señal de control de ciclo cruzado cero, para analizar la temperatura de la carga detectada mediante un sensor de temperatura y controlar la temperatura hasta la temperatura objetivo; y una parte de conducción del triac que aplica potencia generada desde la parte de generación de la fuente de potencia de activación, como una señal de activación, hacia una entrada de un triac conectado a la carga, de acuerdo con una señal de control de fase o una señal de control de ciclo cruzado cero del microcomputador.								

TABLA A.4. CONTROLADOR DE TEMPERATURA QUE TIENE CONTROL DE FASE Y FUNCION DE CONTROL DE CICLO CRUZADO CERO. (SIC, CONTROLADOR DE TEMPERATURA QUE TIENE CONTROL DE FASE Y FUNCION DE CONTROL DE CICLO CRUZADO CERO)

TABLA A.5.

Expediente	9 70588	Fecha de solicitud	08/07/2009 15:41						
Sector	INGENIERIA ELECTRICA	Clasificación lpc	H4B 7/26 AC;						
Certificado	2309	Tipo concesión							
Vigencia desde	07/12/2007	Hasta	07/12/2027						
Datos Pct	-Inicio Fase nacional	08/08/2009							
	-Fecha presentación Internacional	07/12/2007							
	-Solicitud Internacional Nº	PCT/EP2007/063493							
	-Publicación Internacional Nº	WO2008/083886							
	-Fecha publicación Internacional	17/07/2008							
Título	MÉTODOS PARA DETECTAR E INDICAR PARÁMETROS DE TIEMPO E IDENTIDAD DE UN GRUPO DE CELDAS PARTICULAR A PARTIR DE UN NÚMERO DE GRUPOS DE CELDAS EN UNA SEÑAL RECIBIDA POR UN SISTEMA DE COMUNICACIÓN CELULAR QUE EMPLEA UN MARCO DE RADIO EN UNA CAPA FÍSICA								
Dueño(s)	TELEFONAKTIEBOLAGET L M ERICSSON (PUBL)								
Inventor(es)	BENGT LINDOFF								
	ROBERT BALDEMAIR								
	ERIK DAHLMAN								
Prioridad	US 60/883.898 08/01/2007 AC								
Gaceta	Numero	Fecha	NP						
	613	19/02/2010	1276						
Estado	CONCESION 2012-11-26 23:32:10								
	<u>Etapas del Trámite</u>								
Resumen	Un método para indicar parámetros de tiempo y la identidad de un grupo de células en particular a partir de un número, M, de posibles grupos de células en una señal transmitida por un sistema de comunicación celular que emplea un bastidor de radio en un nivel físico; el bastidor de radio que comprende un número de intervalos de tiempo, el método que comprende:								
	transmitir, en uno de los intervalos de tiempo conocidos del bastidor de radio, una señal de sincronización, S ₁ , que comprende un par de secuencias								
	organizadas en una primera ordenación, y								
	transmitir, en otro de los intervalos de tiempo conocidos del bastidor de radio, una señal de sincronización, S ₂ , que comprende el par de secuencias								
	organizadas en una segunda ordenación,								
	en donde:								
cada miembro del par de secuencias,									

	es seleccionado de entre un grupo que comprende por lo menos diferentes secuencias de
	el par de secuencias seleccionadas es identificado únicamente con el grupo de células en particular, donde:
	la primera ordenación de secuencias es utilizada solo para transmitir en uno de los intervalos de tiempo conocidos del bastidor de radio, y la segunda ordenación de secuencias es utilizada solamente para transmitir en otro de los intervalos de tiempo conocidos.

TABLA A.5. MÉTODOS PARA DETECTAR E INDICAR PARÁMETROS DE TIEMPO E IDENTIDAD DE UN GRUPO DE CELDAS PARTICULAR A PARTIR DE UN NÚMERO DE GRUPOS DE CELDAS EN UNA SEÑAL RECIBIDA POR UN SISTEMA DE COMUNICACIÓN CELULAR QUE EMPLEA UN MARCO DE RADIO EN UNA CAPA FÍSICA. (SIC, MÉTODOS PARA DETECTAR E INDICAR PARÁMETROS DE TIEMPO E IDENTIDAD DE UN GRUPO DE CELDAS PARTICULAR A PARTIR DE UN NÚMERO DE GRUPOS DE CELDAS EN UNA SEÑAL RECIBIDA POR UN SISTEMA DE COMUNICACIÓN CELULAR QUE EMPLEA UN MARCO DE RADIO EN UNA CAPA FÍSICA)

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
NIT : 800.176.089-2
- / -

 Industria y Comercio SUPERINTENDENCIA	RECIBO DE CAJA	No. 13 - 0069606
		Bogotá D.C., Julio 12 de 2013 - 09:44:38

RECIBIDO DE : CARDENAS & CARDENAS ABOGADOS PI LTDA					NI 830.083.491
*** Soporte del Pago ***					
TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	VR.PAGO
CONSIGNACION	BANCO DE BOGOTA	062754387	196846554	12/07/2013	4.245.000.00

*** Conceptos Pagados ***				
CANT.	RENTISTICO	CONCEPTO	Vr.UNDITARIO	Vr.CONCEPTO
2 50005-01-01	SOLICITUDES	1607 REIVINDICACION PATENTE UNITARIA ADICIONAL A LAS 10 INIC	30.000.00	60.000.00
				\$60.000.00
=====				

SON: **SESENTA MIL PESOS MONEDA CORRIENTE**

Responsable: 

Recibo de Caja Aplicado al Expediente No. _____

CARDENAS & CARDENAS ABOGADOS

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NUEVO CAPÍTULO REIVINDICATORIO CON MARCAS DE CORRECCIÓN

1. Un aparato para decodificar (100) una señal de audio codificada (102), la señal de audio codificada (102) comprende una primera porción (104a) codificada de acuerdo con un primer algoritmo de codificación, una segunda porción (104b) codificada de acuerdo con un segundo algoritmo de codificación, Parámetros BWE (106) para la primera porción (104a) y la segunda porción (104b) y una información del modo de codificación (108) que indica un primer algoritmo de decodificación o un segundo algoritmo de decodificación, que comprende:

Un primer decodificador (110a) para decodificar la primera porción (104a) de acuerdo con el primer algoritmo de decodificación para una primera porción de tiempo de la señal codificada (102) para obtener una primera señal decodificada (114a), en donde el primer decodificador (110a) comprende un codificador basado en LPC;

Un segundo decodificador (110b) para decodificar la segunda porción (104b) de acuerdo con el segundo algoritmo de decodificación para una segunda porción de tiempo de la señal codificada (102) para obtener una segunda señal decodificada (114b), en donde el segundo decodificador (110b) comprende un codificador basado en transformación;

Un módulo BWE (130) con frecuencia de cruce (f_x) variable, el módulo BWE (130) ~~configurado para~~ desarrollar un algoritmo de ampliación de ancho de banda utilizando la primera señal decodificada (114a) y los parámetros BWE (106) para la primera porción (104a), y para desarrollar un algoritmo de ampliación de ancho de banda utilizando la segunda señal decodificada (114b) y el parámetro de ampliación de ancho de banda (106) para la segunda porción (104b),

En donde el módulo BWE (130) ~~está configurado para utilizar~~ una primera frecuencia de cruce (fx1) para la ampliación de ancho de banda para la primera señal decodificada (114a) y utilizar una segunda frecuencia de cruce (fx2) para la ampliación de ancho de banda para la segunda señal decodificada (114b), en donde la primera frecuencia de cruce (fx1) es mayor a la segunda frecuencia de cruce (fx2); y

un controlador (140) para controlar la frecuencia de cruce (fx) para el módulo BWE (130) de acuerdo con la información del modo de codificación (108).

2. El aparato decodificador (100) de la reivindicación 1, que además comprende una interfaz de entrada (900) para ingresar la señal de audio codificada (102) como una secuencia de bits.
3. El aparato decodificador (100) de la reivindicación 1 o de la reivindicación 2, donde el módulo BWE (130) comprende un conmutador (132) ~~configurado para que~~ conmutar entre la primera y segunda porción de tiempo desde el primer decodificador (110a) al segundo decodificador (110b) para que el algoritmo de ampliación de ancho de banda es aplicado a la primera señal decodificada (114a) o a la segunda señal decodificada (114b).
4. El aparato decodificador (100) de la reivindicación 3, donde el controlador (140) ~~configurado para~~ controlar el conmutador (132) depende del algoritmo de decodificación indicado dentro de la información del modo de codificación (108).
5. El aparato decodificador (100) de una de las reivindicaciones precedentes, donde el controlador (140) ~~está configurado para~~ aumentar la frecuencia de cruce (fx) dentro de la primera porción de tiempo o para disminuir la frecuencia de cruce (fx) dentro de la segunda porción de tiempo.

6. Un aparato para codificar (200) una señal de audio (105) que comprende:

Un primer codificador (210a) ~~configurado para~~que codificar de acuerdo con un primer algoritmo de codificación, el primer algoritmo de codificación posee un primer ancho de banda de frecuencia, en donde el primer codificador (210a) comprende un Codificador basado en LPC;

Un segundo codificador (210b) ~~configurado para~~que codificar de acuerdo con un segundo algoritmo de codificación, el segunda algoritmo de codificación posee un ancho de banda de frecuencia menor al primer ancho de banda de frecuencia, en donde el segundo codificador (210b) comprende un codificador basado en transformación;

Una etapa de decisión (220) para indicar el primer algoritmo de codificación para una primera porción (204a) de la señal de audio (105) y para indicar el segundo algoritmo de codificación para una segunda porción (204b) de la señal de audio (105), la segunda porción (204b) es diferente a la primera porción (204a); y

Un módulo de ampliación de ancho de banda (230) para calcular parámetros BWE (106) para la señal de audio (105), donde le módulo BWE (230) está ~~configurado para ser~~es controlado por la etapa de decisión (220) para calcular los parámetros BWE (106) para una banda que no incluye el primer ancho de banda de frecuencia en la primera porción (204a) de la señal de audio (105) y) para una banda que no incluye el segundo ancho de banda de frecuencia en la segunda porción (204b) de la señal de audio (105),

en donde el primer o segundo ancho de banda de frecuencia es definido por una frecuencia de cruce variable (f_x) y en donde la etapa de decisión (220) ~~está configurada fuera de~~expulsa la frecuencia de cruce variable (f_x),

en donde el módulo BWE (230) ~~está configurado para~~ utilizar una primera frecuencia de cruce (fx1) para calcular los parámetros BWE para una señal codificada que utiliza el primer codificador (210a) y utiliza una segunda frecuencia de cruce (fx2) para una señal codificada que utiliza el segundo codificador (210b), en donde la primera frecuencia de cruce (fx1) es mayor que la segunda frecuencia de cruce (fx2).

7. El aparato codificador (200) de la reivindicación 6, que además comprende una interfaz de salida (800) para emitir la señal de audio codificada (102), la señal de audio codificada (102) comprende una primera porción (104a) codificada de acuerdo con un primer algoritmo de codificación, una segunda porción (104b) codificada de acuerdo con un segundo algoritmo de codificación, parámetros BWE (106) para la primera porción (104a) y la segunda porción (104b) e información del modo de codificación (108) que indica el primer algoritmo de decodificación o el segundo algoritmo de decodificación.

8. El aparato codificador (200) de la reivindicación 6 o reivindicación 7, donde el primer o segundo ancho de banda de frecuencia se define por una frecuencia de cruce (fx) variable y donde la etapa de decisión (220) está configurada para emitir la frecuencia de cruce (fx) variable.

9. El aparato codificador (200) de una de las reivindicaciones 6 a 8, donde el módulo BWE (230) comprende un conmutador (232) controlado por la etapa de decisión (220), donde el conmutador (232) ~~está configurado para~~ conmutar entre el primer y segundo codificador ~~de tiempo~~ (210a, 210b) para que la señal de audio (105) es para diferentes porciones de tiempo codificada por el primer o por el segundo codificador (210a, 210b).

10. El aparato codificador (200) de una de las reivindicaciones 6 a 9, donde la etapa de decisión (220) ~~es operativa para~~ analizar la señal de audio (105) o

una primera salida del primer codificador (210a) o una segunda salida del segundo codificador (210b) o una señal obtenida al decodificar una señal de salida del primer codificador (210a) o el segundo codificador (210b) con respecto a una función de destino.

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11. Un método para decodificar una señal de audio codificada (102), la señal de audio codificada (102) comprende una primera porción (104a) codificada de acuerdo con un primer algoritmo de codificación, una segunda porción (104b) codificada de acuerdo con un segundo algoritmo de codificación, parámetros BWE (106) para la primera porción (104a) y la segunda porción (104b) y una información del modo de codificación (108) que indica un primer algoritmo de decodificación o un segundo algoritmo de decodificación, el método comprende:

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la decodificación de la primera porción (104a) de acuerdo con el primer algoritmo de decodificación para una primera porción de tiempo de la señal codificada (102) para obtener una primera señal decodificada (114a), en donde la etapa de decodificación de la primera porción comprende utilizar un codificador basado en LPC;

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la decodificación de la segunda porción (104b) de acuerdo con el segundo algoritmo de decodificación para una segunda porción de tiempo de la señal codificada (102) para obtener una segunda señal decodificada (114b), en donde la etapa de decodificación de la segunda porción (104b) comprende utilizar un codificador basado en transformación;

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desarrollar un algoritmo de ampliación de ancho de banda por medio de un módulo BWE (130) que tiene una frecuencia de cruce controlable (fx), utilizando la primera señal decodificada (114a) y los parámetros BWE (106) para la primera porción (104a), y desarrollar, por medio del módulo BWE (130) que tiene una frecuencia de cruce controlable (fx), un algoritmo de

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ampliación de ancho de banda utilizando la segunda señal decodificada (114b) y el parámetro de ampliación de ancho de banda (106) para la segunda porción (104b),

5 en donde una primera frecuencia de cruce (fx1) es utilizada para la ampliación del ancho de banda para la primera señal decodificada (114a) y una segunda frecuencia de cruce (fx2) es utilizada para la ampliación del ancho de banda para la segunda señal decodificada (114b), en donde la primera frecuencia de cruce (fx1) es mayor que la segunda frecuencia de cruce (fx2); y

10 controlar la frecuencia de cruce (fx) para el módulo BWE (130) de acuerdo con la información del modo de codificación (108).

12. Un método para codificar una señal de audio (105) que comprende:

15 la codificación de acuerdo con un primer algoritmo de codificación, el primer algoritmo de codificación posee un primer ancho de banda de frecuencia, en donde la etapa de codificación de acuerdo con un primer algoritmo de codificación comprende utilizar un codificador basado en LPC;

20 la codificación de acuerdo con un segundo algoritmo de codificación, el segundo algoritmo de codificación posee un segundo ancho de banda de frecuencia menor al primer ancho de banda de frecuencia, en donde la etapa de codificación de acuerdo con un segundo algoritmo de codificación comprende utilizar un codificador basado en transformación;

25 la indicación del primer algoritmo de codificación para una primera porción (204a) de la señal de audio (105) y el segundo algoritmo de codificación para una segunda porción (204b) de la señal de audio (105), la segunda porción (204b) es diferente de la primera porción (204a); y

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el cálculo de parámetros BWE (106) para la señal de audio (105) de modo tal que los parámetros BWE (106) se calculan para una banda que no incluye el primer ancho de banda de frecuencia en la primera porción (204a) de la señal de audio (105) y para una banda que no incluye el segundo ancho de banda de frecuencia en la segunda porción (204b) de la señal de audio (105),

en donde el primer o segundo ancho de banda de frecuencia es definido por una frecuencia de cruce variable (fx),

en donde el módulo BWE (230) ~~está configurado para utilizar~~ una primera frecuencia de cruce (fx1) para calcular los parámetros BWE para una señal codificada utilizando el codificador basado en LPC y utiliza una segunda frecuencia de cruce (fx2) para una señal codificada que utiliza el codificador basado en transformación (210b), en donde la primera frecuencia de cruce (fx1) es mayor que la segunda frecuencia de cruce (fx2).

~~13. Una señal de audio codificada (102) que comprende:~~

~~Una primera porción (104a) codificada de acuerdo con un primer algoritmo de codificación, el primer algoritmo de codificación comprende un codificador basado en LPC;~~

~~Una segunda porción (104b) codificada de acuerdo con un segundo algoritmo de codificación diferente, el segundo algoritmo de codificación comprende un codificador basado en transformación;~~

~~Parámetros de ampliación de ancho de banda (106) para la primera porción (104a) y la segunda porción (104b); y~~

~~Una información del modo de codificación (108) que indica una primera frecuencia de cruce (fx1) utilizada para la primera porción (104a) o una~~

segunda frecuencia de cruce (fx2) utilizada para la segunda porción (104b), en donde la primera frecuencia de cruce (fx1) es mayor que la segunda frecuencia de cruce (fx2).

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14. Un programa de computación para desarrollar, al ser utilizado en una computadora, el método de la reivindicación 13 o la reivindicación 14.

NUEVO CAPÍTULO REIVINDICATORIO

1. Un aparato para decodificar (100) una señal de audio codificada (102), la señal de audio codificada (102) comprende una primera porción (104a) codificada de acuerdo con un primer algoritmo de codificación, una segunda porción (104b) codificada de acuerdo con un segundo algoritmo de codificación, Parámetros BWE (106) para la primera porción (104a) y la segunda porción (104b) y una información del modo de codificación (108) que indica un primer algoritmo de decodificación o un segundo algoritmo de decodificación, que comprende:

Un primer decodificador (110a) para decodificar la primera porción (104a) de acuerdo con el primer algoritmo de decodificación para una primera porción de tiempo de la señal codificada (102) para obtener una primera señal decodificada (114a), en donde el primer decodificador (110a) comprende un codificador basado en LPC;

Un segundo decodificador (110b) para decodificar la segunda porción (104b) de acuerdo con el segundo algoritmo de decodificación para una segunda porción de tiempo de la señal codificada (102) para obtener una segunda señal decodificada (114b), en donde el segundo decodificador (110b) comprende un codificador basado en transformación;

Un módulo BWE (130) con frecuencia de cruce (f_x) variable, el módulo BWE (130) que desarrolla un algoritmo de ampliación de ancho de banda utilizando la primera señal decodificada (114a) y los parámetros BWE (106) para la primera porción (104a), y para desarrollar un algoritmo de ampliación de ancho de banda utilizando la segunda señal decodificada (114b) y el parámetro de ampliación de ancho de banda (106) para la segunda porción (104b),

En donde el módulo BWE (130) utiliza una primera frecuencia de cruce (f_{x1}) para la ampliación de ancho de banda para la primera señal decodificada

(114a) y utilizar una segunda frecuencia de cruce (fx_2) para la ampliación de ancho de banda para la segunda señal decodificada (114b), en donde la primera frecuencia de cruce (fx_1) es mayor a la segunda frecuencia de cruce (fx_2); y

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un controlador (140) para controlar la frecuencia de cruce (fx) para el módulo BWE (130) de acuerdo con la información del modo de codificación (108).

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2. El aparato decodificador (100) de la reivindicación 1, que además comprende una interfaz de entrada (900) para ingresar la señal de audio codificada (102) como una secuencia de bits.

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3. El aparato decodificador (100) de la reivindicación 1 o de la reivindicación 2, donde el módulo BWE (130) comprende un conmutador (132) que conmuta entre la primera y segunda porción de tiempo desde el primer decodificador (110a) al segundo decodificador (110b) para que el algoritmo de ampliación de ancho de banda es aplicado a la primera señal decodificada (114a) o a la segunda señal decodificada (114b).

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4. El aparato decodificador (100) de la reivindicación 3, donde el controlador (140) controla el conmutador (132) depende del algoritmo de decodificación indicado dentro de la información del modo de codificación (108).

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5. El aparato decodificador (100) de una de las reivindicaciones precedentes, donde el controlador (140) aumenta la frecuencia de cruce (fx) dentro de la primera porción de tiempo o para disminuir la frecuencia de cruce (fx) dentro de la segunda porción de tiempo.

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6. Un aparato para codificar (200) una señal de audio (105) que comprende:

Un primer codificador (210a) que codifica de acuerdo con un primer algoritmo de codificación, el primer algoritmo de codificación posee un primer ancho de banda de frecuencia, en donde el primer codificador (210a) comprende un Codificador basado en LPC;

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Un segundo codificador (210b) que codifica de acuerdo con un segundo algoritmo de codificación, el segunda algoritmo de codificación posee un ancho de banda de frecuencia menor al primer ancho de banda de frecuencia, en donde el segundo codificador (210b) comprende un codificador basado en transformación;

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Una etapa de decisión (220) para indicar el primer algoritmo de codificación para una primera porción (204a) de la señal de audio (105) y para indicar el segundo algoritmo de codificación para una segunda porción (204b) de la señal de audio (105), la segunda porción (204b) es diferente a la primera porción (204a); y

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Un módulo de ampliación de ancho de banda (230) para calcular parámetros BWE (106) para la señal de audio (105), donde le módulo BWE (230) es controlado por la etapa de decisión (220) para calcular los parámetros BWE (106) para una banda que no incluye el primer ancho de banda de frecuencia en la primera porción (204a) de la señal de audio (105) y) para una banda que no incluye el segundo ancho de banda de frecuencia en la segunda porción (204b) de la señal de audio (105),

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en donde el primer o segundo ancho de banda de frecuencia es definido por una frecuencia de cruce variable (f_x) y en donde la etapa de decisión (220) expulsa la frecuencia de cruce variable (f_x),

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en donde el módulo BWE (230) utiliza una primera frecuencia de cruce (f_{x1}) para calcular los parámetros BWE para una señal codificada que utiliza el

primer codificador (210a) y utiliza una segunda frecuencia de cruce (fx2) para una señal codificada que utiliza el segundo codificador (210b), en donde la primera frecuencia de cruce (fx1) es mayor que la segunda frecuencia de cruce (fx2).

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7. El aparato codificador (200) de la reivindicación 6, que además comprende una interfaz de salida (800) para emitir la señal de audio codificada (102), la señal de audio codificada (102) comprende una primera porción (104a) codificada de acuerdo con un primer algoritmo de codificación, una segunda porción (104b) codificada de acuerdo con un segundo algoritmo de codificación, parámetros BWE (106) para la primera porción (104a) y la segunda porción (104b) e información del modo de codificación (108) que indica el primer algoritmo de decodificación o el segundo algoritmo de decodificación.

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8. El aparato codificador (200) de la reivindicación 6 o reivindicación 7, donde el primer o segundo ancho de banda de frecuencia se define por una frecuencia de cruce (fx) variable y donde la etapa de decisión (220) está configurada para emitir la frecuencia de cruce (fx) variable.

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9. El aparato codificador (200) de una de las reivindicaciones 6 a 8, donde el módulo BWE (230) comprende un conmutador (232) controlado por la etapa de decisión (220), donde el conmutador (232) conmuta entre el primer y segundo codificador (210a, 210b) para que la señal de audio (105) es para diferentes porciones de tiempo codificada por el primer o por el segundo codificador (210a, 210b).

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10. El aparato codificador (200) de una de las reivindicaciones 6 a 9, donde la etapa de decisión (220) analiza la señal de audio (105) o una primera salida del primer codificador (210a) o una segunda salida del segundo codificador (210b) o una señal obtenida al decodificar una señal de salida del primer

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codificador (210a) o el segundo codificador (210b) con respecto a una función de destino.

11. Un método para decodificar una señal de audio codificada (102), la señal de audio codificada (102) comprende una primera porción (104a) codificada de acuerdo con un primer algoritmo de codificación, una segunda porción (104b) codificada de acuerdo con un segundo algoritmo de codificación, parámetros BWE (106) para la primera porción (104a) y la segunda porción (104b) y una información del modo de codificación (108) que indica un primer algoritmo de decodificación o un segundo algoritmo de decodificación, el método comprende:

la decodificación de la primera porción (104a) de acuerdo con el primer algoritmo de decodificación para una primera porción de tiempo de la señal codificada (102) para obtener una primera señal decodificada (114a), en donde la etapa de decodificación de la primera porción comprende utilizar un codificador basado en LPC;

la decodificación de la segunda porción (104b) de acuerdo con el segundo algoritmo de decodificación para una segunda porción de tiempo de la señal codificada (102) para obtener una segunda señal decodificada (114b), en donde la etapa de decodificación de la segunda porción (104b) comprende utilizar un codificador basado en transformación;

desarrollar un algoritmo de ampliación de ancho de banda por medio de un módulo BWE (130) que tiene una frecuencia de cruce controlable (fx), utilizando la primera señal decodificada (114a) y los parámetros BWE (106) para la primera porción (104a), y desarrollar, por medio del módulo BWE (130) que tiene una frecuencia de cruce controlable (fx), un algoritmo de ampliación de ancho de banda utilizando la segunda señal decodificada (114b)

y el parámetro de ampliación de ancho de banda (106) para la segunda porción (104b),

5 en donde una primera frecuencia de cruce (fx1) es utilizada para la ampliación del ancho de banda para la primera señal decodificada (114a) y una segunda frecuencia de cruce (fx2) es utilizada para la ampliación del ancho de banda para la segunda señal decodificada (114b), en donde la primera frecuencia de cruce (fx1) es mayor que la segunda frecuencia de cruce (fx2); y

10 controlar la frecuencia de cruce (fx) para el módulo BWE (130) de acuerdo con la información del modo de codificación (108).

12. Un método para codificar una señal de audio (105) que comprende:

15 la codificación de acuerdo con un primer algoritmo de codificación, el primer algoritmo de codificación posee un primer ancho de banda de frecuencia, en donde la etapa de codificación de acuerdo con un primer algoritmo de codificación comprende utilizar un codificador basado en LPC;

20 la codificación de acuerdo con un segundo algoritmo de codificación, el segundo algoritmo de codificación posee un segundo ancho de banda de frecuencia menor al primer ancho de banda de frecuencia, en donde la etapa de codificación de acuerdo con un segundo algoritmo de codificación comprende utilizar un codificador basado en transformación;

25 la indicación del primer algoritmo de codificación para una primera porción (204a) de la señal de audio (105) y el segundo algoritmo de codificación para una segunda porción (204b) de la señal de audio (105), la segunda porción (204b) es diferente de la primera porción (204a); y

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el cálculo de parámetros BWE (106) para la señal de audio (105) de modo tal que los parámetros BWE (106) se calculan para una banda que no incluye el primer ancho de banda de frecuencia en la primera porción (204a) de la señal de audio (105) y para una banda que no incluye el segundo ancho de banda de frecuencia en la segunda porción (204b) de la señal de audio (105),

en donde el primer o segundo ancho de banda de frecuencia es definido por una frecuencia de cruce variable (f_x),

en donde el módulo BWE (230) utiliza una primera frecuencia de cruce (f_{x1}) para calcular los parámetros BWE para una señal codificada utilizando el codificador basado en LPC y utiliza una segunda frecuencia de cruce (f_{x2}) para una señal codificada que utiliza el codificador basado en transformación (210b), en donde la primera frecuencia de cruce (f_{x1}) es mayor que la segunda frecuencia de cruce (f_{x2}).

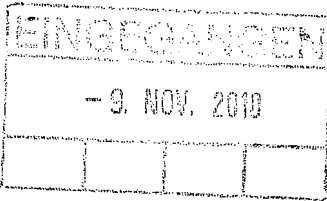
PATENT COOPERATION TREATY

From the
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PCT

NOTIFICATION OF TRANSMITTAL OF
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International application No. PCT/EP2009/004522		International filing date (day/month/year) 23.06.2009		Priority date (day/month/year) 11.07.2008										
Applicant FRAUNHOFER GESELLSCHAFT ZUR FÖRDERUNG														
1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application. 2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices. 3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices. 4. REMINDER The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301). Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned. For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide. The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.														
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465			Authorized Officer Poquet, Rosa Tel. +49 89 2399-2911											
			<table border="1"> <tr> <td>FRISTENDE</td> <td></td> <td></td> </tr> <tr> <td>VOR-</td> <td></td> <td></td> </tr> <tr> <td>FRIST</td> <td></td> <td></td> </tr> </table>			FRISTENDE			VOR-			FRIST		
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference FH090616PCT	FOR FURTHER ACTION See Form PCT/PEA/416	
International application No. PCT/EP2009/004522	International filing date (day/month/year) 23.06.2009	Priority date (day/month/year) 11.07.2008
International Patent Classification (IPC) or national classification and IPC INV. G10L19/14		
Applicant FRAUNHOFER GESELLSCHAFT ZUR FÖRDERUNG		
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>9</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. ☒ sent to the applicant and to the International Bureau a total of <u>7</u> sheets, as follows: ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). ☒ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3bis of Annex C of the Administrative Instructions).		
4. This report contains indications relating to the following items: ☒ Box No. I Basis of the report ☐ 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 Article 35(2) with regard to novelty, inventive step or 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		
Date of submission of the demand 2010-05-10	Date of completion of this report 08.11.2010	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	Authorized officer Geißler, Christian Telephone No. +49 89 2399-4796 	

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2009/004522

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
 - ☒ 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 (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-30 as originally filed

Claims, Numbers

1-14 filed with the demand for preliminary international examination

Drawings, Sheets

1/9-9/9 as originally filed

- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.
3. ☒ The amendments have resulted in the cancellation of:
 - ☐ the description, pages
 - ☒ the claims, Nos. 15, 16
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
 4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)):
 - ☐ the description, pages
 - ☒ the claims, Nos. 6, 12, 13, 14 (partially)
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 5. ☐ 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 70.2 (e)).
 6. ☐ Supplementary international search report(s) from Authority(ies) have been received and taken into account in drawing up this report (Rule 45bis.8(b) and (c)).

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2009/004522

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-5, 9, 11</u>
	No: Claims	<u>6-8, 10, 12-14</u>
Inventive step (IS)	Yes: Claims	<u>1-5, 11</u>
	No: Claims	<u>6-10, 12-14</u>
Industrial applicability (IA)	Yes: Claims	<u>1-14</u>
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

Re Item I**Basis of the report**

1 Reference is made to the following documents:

- D1 WO 02/41302 A (CODING TECHNOLOGIES SWEDEN AB [SE]; HENN FREDRIK [SE]; EHRET ANDREAS []) 23 May 2002 (2002-05-23)
- D6 WO 2008/031458 A1 (ERICSSON TELEFON AB L M [SE]; BRUHN STEFAN [SE]) 20 March 2008 (2008-03-20)
- D7 US 6 134 518 A (COHEN GILAD [IL] ET AL) 17 October 2000 (2000-10-17)

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

2 Claims 6, 12, 13 and 14 (partially)

2.1 The amendments, filed with the demand, for independent claims 6 (apparatus for encoding), 12 (method for encoding), 13 (encoded audio signal) and 14 (computer program; considered as far as dependent on claim 12; note that the reference in claim 14 to "*the method of claim 13 or claim 14*" should have been corrected into "*the method of claim 11 or claim 12*" after the renumbering of the claims with the amendments) **introduce subject-matter which extends beyond the content of the application as filed**, contrary to Article 34(2)(b) PCT for the following reasons:

2.1.1 Although one might consider the amendments in encoder claim 6 to be corresponding to the amendments in decoder claim 1 (where the amendments have been performed as inclusions of dependent claims that had already been in the set of claims as originally filed), the resulting subject-matter of claim 6 is **not directly and unambiguously derivable** from the application as filed.

2.1.1.1 In a first aspect, the additional features of amended claim 6 had not already been disclosed by claims of the original claim set dependent on original claim 8 (from which amended claim 6 has been derived after claim renumbering) as opposed to the features added for decoding apparatus claim 1. So the amended claim 6 with its additional features has no basis in the original claim set.

2.1.1.2 In a second aspect, there might well be a passage in the description that is very close to the claimed subject-matter, which passage is p. 9, l. 22 - p. 11, l. 2 (embodiment referring to Fig. 2). But not all features of the embodiment described there - or at least not features defining the same subject-matter - are included in claim 6.

Features of this embodiment of the description that cannot be found in claim 6 are e.g. (list not necessarily exhaustive; cited page and line numbers refer to description):

- partially "time portion" (e.g. p. 9, l. 38; p. 10, l. 1) instead of simply "portion" as in claim 6
- "audio (music) encoder" (p. 9, l. 33-34) instead of "transform-based coder" (although p. 3, l. 24-25 provides a relation between the two expressions they can still not be considered equivalent but in this passage coders for music are presented as a subset of transform-based coders)
- p. 10, l. 17-18: "[frequency components] are limited towards the lower end of the spectrum by the crossover frequency f_x " missing in claim 6
- p. 10, l. 27-29: "The modified coding mode information 108' comprises the corresponding switch signal" missing in claim 6
- p. 10, l. 37-38: "The coding mode information 108 indicates, [for example ...]" missing in claim 6; it is to be noted that, although the part after "for example" may be regarded as optional feature, at least a "coding mode information" is not introduced in claim 6 at all

Consequently the subject-matter of claim 6 represents a **generalization** with respect to this embodiment and therefore this embodiment cannot be considered as basis.

On the other hand the above-mentioned embodiment does not disclose the feature that the crossover frequency for encoding with the LPC-based coder is higher than the crossover frequency for the transform-based coder which has

been introduced in amended claim 6 because it is crucial for distinguishing the subject-matter of the claim from the prior art. Therefore this important feature has no basis in the above embodiment of the description.

2.2 In view of the non-compliance of amended claim 6 with Article 34(2)(b) PCT - the non-compliance having been introduced with the additional features - the claim is considered in the following **as if the amendments had not been carried out** in accordance with Rule 70 (2) (c) PCT, which means that amended claim 6 is considered as if it still was identical to original claim 8 from which amended claim 6 has been derived.

2.3 From this point of view, the subject-matter of present independent encoding apparatus claim 6 is **not new** in the sense of Article 33(2) PCT because International Search Report Document D1 discloses, applying the wording of claim 6:

"An apparatus for encoding an audio signal (D1, title) comprising:

a first encoder which is configured to encode in accordance with a first encoding algorithm, the first encoding algorithm having a first frequency bandwidth (D1, p. 3, l. 8-10);

a second encoder which is configured to encode in accordance with a second encoding algorithm, the second encoding algorithm having a second frequency bandwidth being smaller than the first frequency bandwidth (D1, p. 3, l. 10-14 and l. 18-21);

a decision stage for indicating the first encoding algorithm for a first portion of the audio signal and for indicating the second encoding algorithm for a second portion of the audio signal, the second portion being different from the first portion (D1, p. 3, l. 12-14 and l. 19-21; p. 5, l. 7-10, l. 24-25 and l. 30-34; p. 6, l. 1-4 and l. 9-11; p. 7, l. 2-7); and

a bandwidth extension module for calculating BWE parameters for the audio signal, wherein the BWE module is configured to be controlled by the decision stage to calculate the BWE parameters for a band not including the first frequency bandwidth in the first portion of the audio signal and for a band not including the second frequency bandwidth in the second portion of the audio signal (D1, p. 3, l. 12-14 and l. 19-21; p. 5, l. 7-10; p. 7, l. 2-7)."

Consequently, D1 anticipates the subject-matter of present independent claim 6, which therefore fails to be novel (Art. 33(2) PCT).

2.4 The same objections from above (Art. 34(2)(b) and 33(2) PCT) **apply also to corresponding independent claims 12-14.**

2.5 Claims 7, 8 and 10

The subject-matters of present dependent apparatus claims 7, 8 and 10 are **not new** in the sense of Article 33(2) PCT, because the additional features of these claims are also disclosed in D1 as follows:

Claim 7 (interface):	D1, p. 7, l. 23-25
Claim 8 (crossover freq.):	D1, p. 7, l. 28-29 in combination with p. 5, l. 8-10 or l. 30-34
Claim 10 (target function):	D1, p. 5, l. 24-36

2.6 Claim 9

Although in D1 the encoder is realized as a single apparatus which is parameterized by the received crossover frequency (cf. D1, p. 7, l. 2-7 and Fig. 5, block 504), it is considered a mere design option to realize the (single) encoder with variable crossover frequency as an arrangement of two separate encoders with different crossover frequencies. Therefore realizing the encoding apparatus as one (as in D1) vs. two (as in claim 9) encoders are simply two straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill.

Consequently the subject-matter of claim 9 **lacks an inventive step** (Art. 33 (3) PCT).

3 Claims 1-5, 11 and 14 (partially)

3.1 The subject-matters of claims 1-5, 11 and 14 (as far as dependent on claim 11) are **new** (Art. 33(2) PCT) **and appear to involve an inventive step** (Art. 33(3) PCT) for the following reasons:

3.2 Field

The present application deals with bandwidth extension in a hybrid audio coding environment.

3.3 Closest prior art

Documents D1 or D6 may be regarded as closest prior art w.r.t. claim 1. Both documents disclose an audio (de) coder using bandwidth extension with a controllable crossover frequency (cf. D1, p. 3, l. 8-21 / D6, p. 8, l. 25-27; p. 12, l. 21-27; p. 13, l. 11-15 and l. 24-26; p. 14, l. 9-15).

D1 and D6 only refer to a single (type of) codec.

3.4 Novelty, Article 33(2) PCT

In claim 1 it is additionally claimed that the first and second decoder are an LPC- based and transform- based decoder, respectively, and that the crossover frequency of the LPC-based decoder is higher than the crossover frequency of the transform-based decoder (claim 1, l. 18, l. 24-25 and l. 36-4).

These features are not disclosed in D1. Thus claim 1 is **new**.

3.5 Inventive step, Article 33(3) PCT

The objective technical problem may be regarded as to reduce coding bitrate without losing audio quality. The additional features of claim 1 from above solve this problem because it is possible to select a (de)coder type most appropriate for the signal properties (e.g. LPC-based coder for speech signals and transform-based coder for music, cf. description of the application, p. 8, l. 20-27 and p. 3, l. 19-28) and the crossover frequency takes into account the (de)coder properties (p. 3, l. 19-32).

Hybrid coders are known, i.e. a combination of e.g. a time-domain and a frequency- domain coder and selection of the coder according to signal properties, as e.g. disclosed in D7 (it is to be remarked that in D7 bandwidth extension is not mentioned). But the combination of D7 with one of D1 and D6 would not teach how to integrate the controllable crossover frequency function of the single coders of D1 or D6 into the hybrid coder. The skilled person would at least not get any hint in the documents or the combination of them to use for the bandwidth extension of the LPC- based (de) coder a higher crossover frequency than for the transform-based (de)coder. This approach is

motivated in the application by the finding that choosing the crossover frequencies in this way is most appropriate for the characteristics of the two types of (de)coders (cf. description, p. 3, l. 19-32). Neither D1 and D6, where hybrid coding is not an issue, nor D7 which is silent about bandwidth extension, point to this approach.

Thus the solution proposed in claim 1 is considered as involving an **inventive step**.

3.6 Claims 11 and 14

Independent claims 11 (method) and 14 (computer program) correspond to apparatus claim 1 and as such their subject-matters also **meet the requirements of the PCT with respect to novelty** (Art. 33(2) PCT) and **inventive step** (Art. 33(3) PCT).

Re Item VI

Certain documents cited

Certain published documents

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date(valid claim) (day/month/year)
EP2077551 A1	08/07/2009	24/05/2008	04/01/2008
WO2009081315 A1	02/07/2009	12/12/2008	18/12/2007

Claims

1. An apparatus for decoding (100) an encoded audio signal (102), the encoded audio signal (102) comprising a first portion (104a) encoded in accordance with a first encoding algorithm, a second portion (104b) encoded in accordance with a second encoding algorithm, BWE parameters (106) for the first portion (104a) and the second portion (104b) and a coding mode information (108) indicating a first decoding algorithm or a second decoding algorithm, comprising:
- a first decoder (110a) for decoding the first portion (104a) in accordance with the first decoding algorithm for a first time portion of the encoded signal (102) to obtain a first decoded signal (114a), wherein the first decoder (110a) comprises an LPC-based coder;
- a second decoder (110b) for decoding the second portion (104b) in accordance with the second decoding algorithm for a second time portion of the encoded signal (102) to obtain a second decoded signal (114b), wherein the second decoder (110b) comprises a transform-based coder;
- a BWE module (130) having a controllable crossover frequency (fx), the BWE module (130) being configured for performing a bandwidth extension algorithm using the first decoded signal (114a) and the BWE parameters (106) for the first portion (104a), and for performing a bandwidth extension algorithm using the second decoded signal (114b) and the bandwidth extension parameter (106) for the second portion (104b),
- wherein the BWE module (130) is configured to use a first crossover frequency (fx1) for the bandwidth extension for the first decoded signal (114a) and to

use a second crossover frequency (fx2) for the bandwidth extension for the second decoded signal (114b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2); and

5

a controller (140) for controlling the crossover frequency (fx) for the BWE module (130) in accordance with the coding mode information (108).

10 2. The apparatus for decoding (100) of claim 1, further comprising an input interface (900) for inputting the encoded audio signal (102) as a bitstream.

15 3. The apparatus for decoding (100) of claim 1 or of claim 2, wherein the BWE module (130) comprises a switch (132) which is configured to switch between the first and second time portion from the first decoder (110a) to the second decoder (110b) so that the bandwidth extension algorithm is either applied to the first decoded signal (114a) or to the second decoded signal (114b).

20

25 4. The apparatus for decoding (100) of claim 3, wherein the controller (140) is configured to control the switch (132) dependent on the indicated decoding algorithm within the coding mode information (108).

30 5. The apparatus for decoding (100) of one of the preceding claims, wherein the controller (140) is configured to increase the crossover frequency (fx) within the first time portion or to decrease the crossover frequency (fx) within the second time portion.

35 6. An apparatus for encoding (200) an audio signal (105) comprising:

5 a first encoder (210a) which is configured to encode in accordance with a first encoding algorithm, the first encoding algorithm having a first frequency bandwidth, wherein the first encoder (210a) comprises an LPC-based coder;

10 a second encoder (210b) which is configured to encode in accordance with a second encoding algorithm, the second encoding algorithm having a second frequency bandwidth being smaller than the first frequency bandwidth, wherein the second encoder (210b) comprises a transform-based coder;

15 a decision stage (220) for indicating the first encoding algorithm for a first portion (204a) of the audio signal (105) and for indicating the second encoding algorithm for a second portion (204b) of the audio signal (105), the second portion (204b) being different from the first portion (204a); and

20 a bandwidth extension module (230) for calculating BWE parameters (106) for the audio signal (105), wherein the BWE module (230) is configured to be controlled by the decision stage (220) to calculate the BWE parameters (106) for a band not including the first frequency bandwidth in the first portion (204a) of the audio signal (105) and for a band not including the second frequency bandwidth in the second portion (204b) of the audio signal (105),

30 wherein the first or the second frequency bandwidth is defined by a variable crossover frequency (fx) and wherein the decision stage (220) is configured to output the variable crossover frequency (fx),

35 wherein the BWE module (230) is configured to use a first crossover frequency (fx1) for calculating the BWE parameters for a signal encoded using the first

encoder (210a) and to use a second crossover frequency (fx2) for a signal encoded using the second encoder (210b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2).

- 5
7. The apparatus for encoding (200) of claim 6, further comprising an output interface (800) for outputting the encoded audio signal (102), the encoded audio signal (102) comprising a first portion (104a) encoded in accordance with a first encoding algorithm, a
10 second portion (104b) encoded in accordance with a second encoding algorithm, BWE parameters (106) for the first portion (104a) and the second portion (104b) and coding mode information (108) indicating the first
15 decoding algorithm or the second decoding algorithm.
8. The apparatus for encoding (200) of claim 6 or claim 7, wherein the first or the second frequency bandwidth is defined by a variable crossover frequency (fx) and
20 wherein the decision stage (220) is configured to output the variable crossover frequency (fx).
9. The apparatus for encoding (200) of one of the claims 6 to 8, wherein the BWE module (230) comprises a
25 switch (232) controlled by the decision stage (220), wherein the switch (232) is configured to switch between the first and second time encoder (210a, 210b) so that the audio signal (105) is for different time portions either encoded by the first or by the second
30 encoder (210a, 210b).
10. The apparatus for encoding (200) of one of the claims 6 to 9, wherein the decision stage (220) is operative to analyze the audio signal (105) or a first output of
35 the first encoder (210a) or a second output of the second encoder (210b) or a signal obtained by decoding an output signal of the first encoder (210a) or the

second encoder (210b) with respect to a target function.

11. A method for decoding an encoded audio signal (102),
5 the encoded audio signal (102) comprising a first
portion (104a) encoded in accordance with a first
encoding algorithm, a second portion (104b) encoded in
accordance with a second encoding algorithm, BWE
parameters (106) for the first portion (104a) and the
10 second portion (104b) and a coding mode information
(108) indicating a first decoding algorithm or a
second decoding algorithm, the method comprising:
- 15 decoding the first portion (104a) in accordance with
the first decoding algorithm for a first time portion
of the encoded signal (102) to obtain a first decoded
signal (114a), wherein the step of decoding the first
portion comprises using an LPC-based coder;
- 20 decoding the second portion (104b) in accordance with
the second decoding algorithm for a second time
portion of the encoded signal (102) to obtain a second
decoded signal (114b), wherein the step of decoding
the second portion (104b) comprises using a transform-
25 based coder;
- 30 performing a bandwidth extension algorithm by a BWE
module (130) having a controllable crossover frequency
(fx), using the first decoded signal (114a) and the
BWE parameters (106) for the first portion (104a), and
performing, by the BWE module (130) having the
controllable crossover frequency (fx), a bandwidth
extension algorithm using the second decoded signal
35 (114b) and the bandwidth extension parameter (106) for
the second portion (104b),
- wherein a first crossover frequency (fx1) is used for
the bandwidth extension for the first decoded signal

(114a) and a second crossover frequency (fx2) is used for the bandwidth extension for the second decoded signal (114b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2); and

controlling the crossover frequency (fx) for the BWE module (130) in accordance with the coding mode information (108).

12. A method for encoding an audio signal (105) comprising:

encoding in accordance with a first encoding algorithm, the first encoding algorithm having a first frequency bandwidth, wherein the step of encoding in accordance with a first encoding algorithm comprises using an LPC-based coder;

encoding in accordance with a second encoding algorithm, the second encoding algorithm having a second frequency bandwidth being smaller than the first frequency bandwidth, wherein the step of encoding in accordance with a second encoding algorithm comprises using a transform-based coder;

indicating the first encoding algorithm for a first portion (204a) of the audio signal (105) and the second encoding algorithm for a second portion (204b) of the audio signal (105), the second portion (204b) being different from the first portion (204a); and

calculating BWE parameters (106) for the audio signal (105) such that the BWE parameters (106) are calculated for a band not including the first frequency bandwidth in the first portion (204a) of the audio signal (105) and for a band not including the

second frequency bandwidth in the second portion (204b) of the audio signal (105),

5 wherein the first or the second frequency bandwidth is defined by a variable crossover frequency (fx),

10 wherein the BWE module (230) is configured to use a first crossover frequency (fx1) for calculating the BWE parameters for a signal encoded using the LPC-based coder and to use a second crossover frequency (fx2) for a signal encoded using the transform-based coder (210b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2).

15

13. An encoded audio signal (102) comprising:

20 a first portion (104a) encoded in accordance with a first encoding algorithm, the first encoding algorithm comprising an LPC-based coder;

25 a second portion (104b) encoded in accordance with a second different encoding algorithm, the second encoding algorithm comprising a transform-based coder;

25

bandwidth extension parameters (106) for the first portion (104a) and the second portion (104b); and

30 a coding mode information (108) indicating a first crossover frequency (fx1) used for the first portion (104a) or a second crossover frequency (fx2) used for the second portion (104b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2).

35

14. Computer program for performing, when running on a computer, the method of claim 13 or claim 14.

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION CONCERNING INFORMAL
COMMUNICATIONS WITH THE APPLICANT

(PCT Rule 66.6)

To:

SCHOPPE, ZIMMERMANN, STÖCKELER &
ZINKLER
Postfach 246
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ALLEMAGNE

EINGEGANGEN
- 8. NOV. 2010

Date of mailing (day/month/year)	05.11.2010
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Applicant's or agent's file reference FH090616PCT
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TRANSMITTAL FOR INFORMATION

International application No. PCT/EP2009/004522
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International filing date (day/month/year) 23.06.2009
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Applicant FRAUNHOFER GESELLSCHAFT ZUR FÖRDERUNG
--

An informal communication took place on 26.10.2010, between the International Preliminary Examining Authority and the applicant / the agent.

A copy of the note on that communication (Form PCT/IPEA/428) is herewith transmitted for your information.

Name and mailing address of the international preliminary examining authority:
 European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465

Authorized Officer
Poquet, Rosa
Tel. +49 89 2399-2911


Vertrag über die internationale Zusammenarbeit auf dem Gebiet des Patentwesens
Patent Cooperation Treaty
Traité de coopération en matière de brevets

PCT

Application No.:

PCT/EP2009/004522

Note on an informal communication by telephone with the Applicant

A copy of this note is being sent to the Applicant for information

Participants

Applicant: FRAUNHOFER GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN
FORSCHUNG e.V.

Representative: Zinkler, Franz

Examiner(s): Geißler, Christian

Summary of the communication

See Separate Sheet



26.10.2010

.....
Date

Geißler, Christian

.....
Authorized officer of IPEA

**Vertrag über die Internationale Zusammenarbeit auf dem Gebiet des Patentwesens
Patent Cooperation Treaty
Traité de coopération en matière de brevets**

PCT

Application number:

EP2009/004522

In response to the applicant's conditional request for a telephone interview, the examiner called the representative of the applicant.

The examiner indicated that it seems that independent decoder claim 1 (filed with the demand) fulfills the requirements of the PCT. But he also pointed out that the subject-matter of independent encoder claim 6 (filed with the demand) is still considered to go beyond the content of the application as originally filed, contrary to Article 34(2)(b) PCT.

The representative agreed to receive the International Preliminary Report on Patentability on the basis of the claims on file.

SCHOPPE ZIMMERMANN STÖCKELER ZINKLER PARTNER

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October 13, 2010

International Patent Application PCT/EP2009/004522**Applicant: Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.****Our Ref.: FH090616PCT / kh / rs**In reply to the Written Opinion of the International Preliminary Examining Authority:

Under section 1 the International Preliminary Examining Authority introduced new prior art references.

Under section 2.1 the International Preliminary Examining Authority outlines that claim 1 is not inventive. This conclusion, however, is respectfully traversed for the following reasons:

Document D6 discloses a single encoder 140 and determines different cut-off frequencies for an audio signal encoded using this single encoder, and with respect to the decoder-side, decoded by this single decoder such as decoder 150 in Fig. 2 of document D6.

The cutoff frequency in document D6 is controlled in an open-loop embodiment by performing an analysis of the properties of the given input segment according to some perceptual criterion and to then determine the cutoff frequency for this given segment based on this analysis as outlined on page 13, lines 12-14.

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In the closed-loop embodiment, a coding distortion calculator 606 compares a reconstructed signal with the original signal according to fidelity criterion and adjusts the cut-off frequency accordingly, i.e. reduces the cut-off frequency when the quality is too good or increases the cut-off frequency when the quality is too bad, as outlined in the paragraph bridging pages 13 and 14 of document D6.

Then, on page 14, several additional criteria are mentioned such as the signal class and the noise condition. However, it is very important to understand that page 14, lines 13-15 does not indicate whether the cut-off frequency is to be increased or reduced for speech, music, mixed or inactivity. Instead, it is simply stated that the signal class may influence the segmentation and cut-off frequency selection.

Regarding the alternative feature, i.e. the target bitrate, it is outlined that a lower target bitrate will lead to a lower cut-off frequency and vice versa.

However, any bitrate considerations only make sense with a single encoder.

Furthermore, the open-loop or closed-loop determination only makes sense with a single encoder.

Hence, claim 1 is new over document D6 for the following reasons:

Claim 1 does not only require a single decoder, but a first decoder and a second decoder.

Furthermore, claim 1 requires that the first encoder is an LPC-based coder and the second coder is a transform-based coder.

Furthermore, claim 1 requires that, for the two different encoders, two different crossover frequencies are to be used.

Finally, and most importantly, the crossover frequency for the LPC-based coder (first crossover frequency) is higher than the crossover frequency for the transform-based coder.

Document D7 discloses a digital audio signal coding using a CELP coder and a transform coder, but is completely silent on any bandwidth extension or crossover frequency issues.

Hence, if those skilled in the art would combine document D6 and document D7, an apparatus would result having a first decoder and a second decoder and having a bandwidth extension module, which would probably, in the open- or closed-loop embodiment, determine anything. However, it would be unclear for those skilled in the art how the usage of the two different encoders, a CELP encoder and a transform coder, would fit to all the teachings of document D6 which are all related to a single encoder.

However, the combination of both references would not result in the teaching that the LPC-based coder has a higher crossover frequency than the transform-based coder.

However, this specific feature provides a significant advantage over the prior art due to the following reasons.

As outlined on page 3, penultimate paragraph, the LPC encoder is a time-domain encoder and therefore, usually codes a significant bandwidth due to the LPC-based procedure. Therefore, the LPC-based coder inherently has a higher core bandwidth which means that the crossover frequency for the LPC-based coder can be set to a high value without losing audio quality. Setting the crossover frequency to a high value automatically means that the amount of side information from the bandwidth extension module is lower than in a situation in which the crossover frequency is set to a lower value. Stated differently, the LPC encoder inherently has a higher bandwidth than the transform-based coder due to the fact that it is a time-domain encoder, and therefore, a high crossover frequency immediately resulting in a lower bandwidth extension information bitrate without losing quality will result.

On the other hand, the transform encoder typically scales with the number of spectral lines to be encoded, and therefore, having a high crossover frequency for the transform-based encoder would result in a very high bitrate for the transform-based encoder. In accordance with the invention, the bitrate required by the transform-based encoder is reduced by keeping the crossover frequency at a low value.

Naturally, the LPC-based coder is not optimum for all kinds of signals, although the LPC-based coder typically has a lower bitrate than the transform-based encoder. Therefore, in order to not lose audio quality, the present invention requires, in clear contrast to document D6, two different encoders.

Furthermore, keeping the crossover frequency high for the LPC-based coder results in a low bitrate overhead for the bandwidth extension information without any loss of audio quality, and the fact that a reasonable bitrate for the transform-based coder, and in addition in a reasonable audio quality, due to the fact that in clear contrast to document D7 bandwidth extension technologies are applied.

In view of the above, the present invention as defined in claim 1 and in the other independent claims has significant advantages, and as discussed before, a combination of the newly cited references or of the other cited references does not result in the specific feature that not just any different band crossover frequencies are defined in claim 1, but that a very specific combination is defined, i.e. that the LPC-based coder has a high crossover frequency and the transform-based coder has a low crossover frequency.

Finally, the representative would like to once again emphasize that a combination of document D7 and document D6 is not clear for those skilled in the art due to the fact that the whole bandwidth extension control requirements in document D6 are tailored to a single encoder and if this single encoder was replaced by two different encoders, those skilled in the art would not know how to implement the open-loop or the closed-loop control functionalities, since the usage of different encoders also influences the control properties in the open-loop embodiment, and also influences the control properties in the closed-loop embodiment, which are described on page 13, lines 11-29 and page 14, lines 1-4.

Subsequently, section 2.3 of the Written Opinion is discussed. The present invention as defined in claim 1 does not say any increase or decrease of the crossover frequency, but clearly states that the crossover frequency for the LPC-based coder is higher than the crossover frequency for the transform-based coder. Since this selection of crossover frequency values for the specific different coders provides significant advantages as defined before, the selection is based on the exercise of inventive skill.

Regarding the Examiner's arguments under section 2.3.1 and section 2.3.2, the Examiner has not indicated why those skilled in the art would see from document D6 or from document D7 that the LPC-based coder has a high crossover frequency and the transform-based coder has a lower crossover frequency. This decisive point was not discussed in section 2.3.

In view of this, it is respectfully submitted that the pending claims are new and inventive over the prior art.

Under section 5 the Examiner outlined that claim 6 and claim 13 introduce subject matter which extends beyond the content of the application as filed. However, this statement is respectfully traversed for the following reasons.

Page 9, lines 22 to page 10, line 4 are related to Fig. 2, and Fig. 2 illustrates all elements in claim 6 using the same terms. Furthermore, page 9, lines 31-34, clearly state that the first encoder is a speech coder such as an LPC-based coder and the second encoder is an audio (music) encoder. Therefore, claim 6 is not only based on a dependent claims, but also clearly based on the description.

In the second paragraph of section 5.1.1 the Examiner points to a "switch" and probably means page 10, line 23. However, it is outlined on page 10, line 23, that the bandwidth extension module 230 may comprise a switch, but there is no disclosure saying that it must comprise a switch. It is immediately clear that, when Fig. 2 is considered, there are different implementations for how to implement different functionalities. The first encoder and the second encoder could operate concurrently and the output of only one of the encoders would be written into the bitstream. Alternatively, the two encoders could operate alternately, i.e. only the encoder that provides its output into the bitstream is active and the other is not. Whether there is a switch in the bandwidth extension module or not is therefore not an issue for the broad teaching of the present invention, as discussed on page 9, third paragraph. Furthermore, it is outlined that the term "audio (music) encoder" on page 9, lines 33 and 34, is used with the term "transform-based coder" as alternatives in the specification. For example, reference is made to page 3, lines 24 and 25 reading as follows:

"Transform-based coders (e.g. coders for music)..."

In view of this, it is respectfully submitted that it is believed that all pending claims are originally supported.

In view of the above, it is believed that the application is in a final condition for allowance. Therefore, a positive International Preliminary Examination Report is respectfully requested. Should there be any remaining issues, a telephone call with the Examiner is requested.

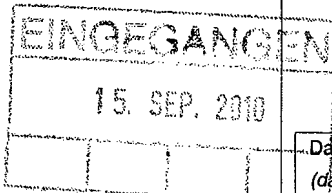

Franz Zinkler

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

SCHOPPE, ZIMMERMANN, STÖCKELER &
ZINKLER
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PCT

WRITTEN OPINION OF THE
INTERNATIONAL PRELIMINARY
EXAMINING AUTHORITY

(PCT Rule 66)

Applicant's or agent's file reference FH090616PCT		Date of mailing (day/month/year) 14.09.2010	
International application No. PCT/EP2009/004522	International filing date (day/month/year) 23.06.2009	Priority date (day/month/year) 11.07.2008	
International Patent Classification (IPC) or both national classification and IPC INV. G10L19/14		PRISTENDE	14.10.10
		VOR-	30.9.10
Applicant FRAUNHOFER GESELLSCHAFT ZUR FÖRDERUNG		FRIST	
		ERLEDIGT	

- ☒ The written opinion established by the International Searching Authority:
☒ is ☐ is not
considered to be a written opinion of the International Preliminary Examining Authority.
- 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 66.2(a)(ii) with regard to novelty, inventive step or 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
- The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(e).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4bis. For an informal communication with the examiner, see Rule 66.6. For an additional opportunity to submit amendments, see Rule 66.4.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
- The final date by which the international preliminary report on patentability (Chapter II of the PCT) must be established according to Rule 69.2 is: 11.11.2010

Name and mailing address of the international preliminary examining authority:

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**WRITTEN OPINION OF THE INTERNATIONAL
PRELIMINARY EXAMINING AUTHORITY**

International application No.
PCT/EP2009/004522

Box No. I Basis of the 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 (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))
2. With regard to the elements of the international application, this opinion has been established on the basis of
(*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

Description, Pages

1-30 as originally filed

Claims, Numbers

1-14 filed with the demand for preliminary international examination

Drawings, Sheets

1/9-9/9 as originally filed

- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.
3. ☒ The amendments have resulted in the cancellation of:
 - ☐ the description, pages
 - ☒ the claims, Nos. 15,16
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 4. ☒ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages
 - ☒ the claims, Nos. 6-10,12,13
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 5. ☐ 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 66.1(d-bis)).
 6. ☐ Supplementary international search report(s) from Authority(ies) have been received and taken into account in drawing up this opinion (Rule 45bis.8(b) and (c)).

**WRITTEN OPINION OF THE INTERNATIONAL
PRELIMINARY EXAMINING AUTHORITY**

International application No.
PCT/EP2009/004522

Box No. V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement
- | | | |
|-------------------------------|--------|-------------|
| Novelty (N) | Claims | |
| Inventive step (IS) | Claims | <u>1-14</u> |
| Industrial applicability (IA) | Claims | |
2. Citations and explanations:
- see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Prior Art

The following documents were not cited in the International Search Report. Copies of the documents are appended hereto:

D6: WO2008031458 A1

D7: US6134518 A

2 Claim 1

2.1 The present application does not meet the criteria of Article 33 (1) PCT, because the subject-matter of independent apparatus claim 1 does **not involve an inventive step** in the sense of Article 33(3) PCT.

2.2 Document D6 discloses, applying part of the wording of claim 1 (note that the document discusses a "codec" which by definition includes en coder and decoder, cf. D6, p. 1, l. 11-12):

"An apparatus for decoding an encoded audio signal (D6, title), the encoded audio signal comprising a first portion [...], a second portion [...] (D6, p. 8, l. 25-26: successive 'segments' represent different portions of the signal), BWE parameters for the first portion and the second portion (D6, Fig. 2, output of block 180) [...], comprising:

a [...] decoder for decoding the first portion in accordance with the [...] decoding algorithm for a first time portion of the encoded signal to obtain a first decoded signal (D6, p. 12, l. 25-26: 'core codec') [...]

[...] [and] for decoding the second portion in accordance with the [...] decoding algorithm for a second time portion of the encoded signal to obtain a second decoded signal (D6, p. 12, l. 25-26: (same) 'core codec') [...];

a BWE module having a controllable crossover frequency (D6, p. 13, l. 11-15), the BWE module being configured for performing a bandwidth extension algorithm using the first decoded signal and the BWE parameters for the first portion (D6, Fig. 2, receiver 165 and p. 12, l. 21-24), and for performing a

bandwidth extension algorithm using the second decoded signal and the bandwidth extension parameter for the second portion (ditto: same procedure for the next segment of the signal),

wherein the BWE module is configured to use a first crossover frequency for the bandwidth extension for the first decoded signal and to use a second crossover frequency for the bandwidth extension for the second decoded signal (D6, p. 13, l. 24-26 and p. 14, l. 9-15), {...}; and

a controller for controlling the crossover frequency for the BWE module in accordance with the coding mode information (D6, p. 10, l. 14-17)."

- 2.3 It is to be noted that selecting "*the first crossover frequency [...] [to be] higher than the second crossover frequency*" (cf. omitted passage in the above citation marked as "{...}"; emphasis added) is just one of the two straightforward possibilities, i.e. either to have a higher or to have a lower crossover frequency, from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill.

- 2.3.1 Starting from this apparatus for decoding in D6, the skilled person will be aware of the fact that audio signals have different properties (e.g. speech signals vs. music signals) and thus of the problem of optimizing the coder in dependence of signal properties. He will then know from document D7 that such a problem can be solved by (cf. omitted passages in the above citation marked by "{...}"):

[cf. D7, col. 2, l. 46-59:]

" a first decoder for decoding the first portion in accordance with the first decoding algorithm for a first time portion of the encoded signal to obtain a first decoded signal, wherein the first decoder comprises an LPC- based coder;

a second decoder for decoding the second portion in accordance with the second decoding algorithm for a second time portion of the encoded signal to obtain a second decoded signal, wherein the second decoder comprises a transform-based coder;"

- 2.3.2 The combination of the features from this citation and the citation above is exactly the solution proposed in claim 1. It is especially to be noted that both documents directly assign a mode to a certain type/class of signals (e.g. the classification of "speech" vs. "music", cf. D6, p. 14, l. 9-15: cutoff frequency dependent on signal class and D7, col. 2, l. 51-54 and col. 3, l. 1-3: coder (CELP or transform) dependent on signal class). Thus the combination of the

teachings of these two documents leads to an apparatus where for a certain decoder (LPC-based or transform-based), the decoder representing a decoder for a particular one of these classes, exactly one specific crossover frequency is assigned, as claimed in claim 1.

2.3.3 Consequently the subject-matter of claim 1 fails to fulfill the requirements under the PCT for lack of an inventive step (Art. 33(3) PCT).

3 Claims 2-5

The subject-matters of dependent apparatus claims 2-5 lack **an inventive step** in the sense of Article 33(3) PCT, because the additional features of these claims are also disclosed in at least one of D6 and D7 as follows:

Claim 2 (bitstream input):	D6, p. 9, l. 21-23; D7, col. 8, l. 45
Claims 3/4 (switch coding mode):	D7, col. 8, l. 51-54 and Fig. 2
Claim 5 (increase/decrease crossover frequency):	D6, p. 13, l. 11-15

4 Claims 11 and 14

Independent claims 11 (method) and 14 (computer program; remark: the reference to the method "*of claim 13 or claim 14*" should apparently read "*of claim 11 or 12*" after the renumbering of the claims with the amendments) correspond to independent apparatus claim 1. Therefore the subject-matters of claims 11 and 14 fail to fulfill the requirements under the PCT for the same reasons already explained for claim 1 (**lack of an inventive step**, Art. 33(3) PCT).

5 Claims 6-10, 12 and 13

5.1 The amendments for independent apparatus claims 6 (encoder) and 13 (encoded audio signal), filed with the demand, **introduce subject-matter which extends beyond the content of the application as filed**, contrary to Article 34(2)(b) PCT for the following reasons:

- 5.1.1 Although one might consider the amendments in encoder claim 6 to be corresponding to the amendments in decoder claim 1 (where the amendments have been performed as inclusions of dependent claims that had already been in the set of claims as originally filed), the resulting subject-matter of claim 6 is not directly and unambiguously derivable from the application as filed.

There might well be a passage in the description that is very close to the claimed subject-matter, which passage is p. 9, l. 22 - p. 11, l. 2. But not all features of the embodiment described there - or at least not features defining the same subject-matter - are included in claim 6. This refers especially to the passage from p. 10, l. 14-29 and e.g. the "switch", presented in this passage as belonging to the embodiment, is not mentioned in the claim.

This represents a generalisation of the subject-matter of claim 6 w.r.t. the disclosure of the application as filed (in that case of this embodiment of the description), not allowable under Article 34(2)(b) PCT.

- 5.1.2 A corresponding objection applies to independent encoded audio signal claim 13.

- 5.2 Notwithstanding this objection the subject-matter of claim 6 would not be inventive (Art. 33(3) PCT) w.r.t. documents D6 and D7 for the same reasons as explained for decoder claim 1 in Sec. 2.

The same holds true for independent claims 12 (method) and 13 (encoded audio signal) corresponding to apparatus claim 6 and for dependent encoder claims 7-10, corresponding to the dependent decoder claims (cf. Sec. 3). The subject-matters of claims 7-10, 12 and 13 would therefore lack an inventive step (Art. 33(3) PCT) as well.

- 5.3 For the sake of completeness and to comply with the requirements of Rule 70 (2)(c) PCT, it is to be mentioned that claim 8 from the claims as originally filed that corresponds to amended claim 6 without the amendments (i.e. the claim has been renumbered with the amendments) does not involve an inventive step (Art. 33(3) PCT) either.

The reason is that original claim 8 contains a subset of the features of amended claim 6 and consequently all features are also disclosed by at least the combination of documents D6 and D7 as stated in Sec. 5.2 and 2, respectively. The same reasoning applies to original encoding method claim 14, from which amended claim 12 has been derived and to original audio signal claim 15, from which amended claim 13 has been derived.

SCHOPPE ZIMMERMANN STÖCKELER ZINKLER & PARTNER

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May 10, 2010

International Patent Application PCT/EP2009/004522**Applicant: Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.****Our Ref.: FH090616PCT / gm/db /ba**In reply to the International Search Report and in preparation for the International Preliminary Examination:

1. Amended claims 1 to 14 are submitted. Additionally, an annotated copy of the amended claims is submitted herewith, in which additions are indicated by underlining and deletions are indicated by crossing out.
2. Amended claim 1 is supported by originally filed claims 5 and 7 and, additionally, by page 28, second paragraph, page 26, lines 25-30 or page 8, lines 20-25 of the application as originally filed.

The same support is for the parallel method claim 11 and claim 13 related to an encoded audio signal.

Regarding the decoder, reference is made to originally filed claims 5 and 7 and the other cited passages with respect to original support. Furthermore, Figs. 3 and 5 illustrate an LPC-based first encoder and a transform-based second encoder, where the crossover frequency for the first encoder is higher than for the second encoder. Further support is, for example, in Fig. 2 or page 10, second paragraph.

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Partnerschaftsgesellschaft,
 eingetragen in das PR unter Nr. PR 974
 USt-Nr. 148/233/00493
 VAT Registration No. DE 270564910

The same support is mentioned for the parallel encoding method in new claim 12.

3. Subsequently, novelty and inventive step of amended claim 1 will be discussed.

Document D1 (WO 02/41302 A1) is silent on the first decoder being an LPC-based coder and a second decoder comprising a transform-based coder.

Instead, document D1 only has a single core decoder 702 (see Fig. 7 of document D1), which is controlled with respect to its crossover frequency based on a measure of the degree of difficulty of encoding a signal with the core coder, a short-time bit demand detection, and a spectral tonality analysis, or any combination thereof, as outlined on page 2, lines 7-9.

Therefore, document D1 discloses to have a single core encoder/core decoder, where the crossover frequency, i.e., the highest frequency encoded by the core encoder/decoder is varied based on a characteristic depending on this specific single core encoder/decoder, i.e., the "measure of difficulty" as, for example, discussed on page 2, lines 9 and 10 of document D1.

Additionally, document D1 is silent on the feature that a first crossover frequency for the bandwidth extension for the LPC-coded/decoded signal is used, which is higher than the second crossover frequency for the second transform-based encoded/decoded signal.

Therefore, claim 1 has at least three novel features, i.e., lines 17 and 18; lines 24 and 25; and line 36, page 1 to line 4, page 2.

The same corresponding novel features are in all other independent claims.

Regarding claim 7, the International Searching Authority points to document D2 (US 2007/0106502 A1).

Document D2 discloses an adaptive time/frequency-based audio encoding and decoding scheme, where a transformation and mode determination unit divides an input audio signal into a plurality of frequency-domain signals and selects a time-

based encoding mode or a frequency-based encoding mode for each frequency-domain signal. Then, the transformation and mode determination unit outputs a frequency-domain signal determined to be encoded in the time-based encoding mode, a frequency-domain signal determined to be encoded in the frequency-based encoding mode, and division information and encoding mode information for each frequency-domain signal.

The Examiner's attention is drawn to [0043] and Fig. 1, where the basic structure of document D2 is illustrated. Hence, it becomes clear that document D2 always performs a time-frequency transform and, then, determines for each band individually whether this band is to be encoded using a time-based encoding method or a frequency-based encoding method.

Now, if those skilled in the art were to combine document D2 and document D1, then this would mean that the core encoder 502 in Fig. 5 would be replaced by the transformation and mode determination unit and the subsequent encoding unit in Fig. 1. This would mean that certain individual bands of the core audio signal band would be encoded using a time-based encoder and other bands would be encoded using the frequency-based encoder.

However, this procedure would pose major problems with respect to the bit-demand analysis or workload analysis as outlined at 603 and 602 in Fig. 6 of document D1, i.e., for the process to be performed in the crossover frequency control module.

Additionally, when it is considered that, at a certain time portion, for example, the first two bands are LPC-encoded in document D2 and the next three bands are frequency-domain encoded, and document D1 would teach to increase or decrease the crossover frequency, if at all possible, depending on the workload/bit-demand, this would not be the feature of claim 1, i.e., to control the crossover frequency module based on the used coding mode. Stated differently, the typical scenario of document D2 is that, at a certain time portion, both coding modes are active, so that the controlling of the crossover frequency depending on the selected coding mode does not make any sense. In other words, when both coding modes are active at the same time, one cannot set the crossover frequency depending on a certain coding mode.

However, this is the feature in the last paragraph of claim 1, i.e., that the crossover frequency is high when there is an LPC-coded signal portion and that the crossover frequency is low, when there is a transform-based coded signal.

Again, since document D2 teaches to have both coding modes, i.e., a time-domain coding mode and a frequency-domain coding mode concurrently, i.e., at the same time, one cannot control the crossover frequency based on the coding mode in document D2.

Therefore, even if those skilled in the art combined document D2 and document D1, which is highly questionable due to the problematic encoder status calculation in document D1, those skilled in the art would not arrive at the inventive apparatus/method as defined in the amended claims.

4. In view of the above, issuance of a positive International Preliminary Examination Report is respectfully requested. Should there be any remaining issues, issuance of a Written Opinion is respectfully requested. Should this not be possible, the Examiner is required to conduct a telephone conversation with the representative as provided for by the PCT Examination Guidelines.

Respectfully submitted,


Franz Zinkler

Encls.:

Clean copy of amended claims

Annotated copy of amended claims

Claims

1. An apparatus for decoding (100) an encoded audio
signal (102), the encoded audio signal (102)
5 comprising a first portion (104a) encoded in
accordance with a first encoding algorithm, a second
portion (104b) encoded in accordance with a second
encoding algorithm, BWE parameters (106) for the first
portion (104a) and the second portion (104b) and a
10 coding mode information (108) indicating a first
decoding algorithm or a second decoding algorithm,
comprising:

15 a first decoder (110a) for decoding the first portion
(104a) in accordance with the first decoding algorithm
for a first time portion of the encoded signal (102)
to obtain a first decoded signal (114a), wherein the
first decoder (110a) comprises an LPC-based coder;

20 a second decoder (110b) for decoding the second
portion (104b) in accordance with the second decoding
algorithm for a second time portion of the encoded
signal (102) to obtain a second decoded signal (114b),
wherein the second decoder (110b) comprises a
25 transform-based coder;

a BWE module (130) having a controllable crossover
frequency (fx), the BWE module (130) being configured
for performing a bandwidth extension algorithm using
30 the first decoded signal (114a) and the BWE parameters
(106) for the first portion (104a), and for performing
a bandwidth extension algorithm using the second
decoded signal (114b) and the bandwidth extension
parameter (106) for the second portion (104b),
35 wherein the BWE module (130) is configured to use a
first crossover frequency (fx1) for the bandwidth
extension for the first decoded signal (114a) and to

use a second crossover frequency (fx2) for the bandwidth extension for the second decoded signal (114b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2); and

5

a controller (140) for controlling the crossover frequency (fx) for the BWE module (130) in accordance with the coding mode information (108).

10 2. The apparatus for decoding (100) of claim 1, further comprising an input interface (900) for inputting the encoded audio signal (102) as a bitstream.

15 3. The apparatus for decoding (100) of claim 1 or of claim 2, wherein the BWE module (130) comprises a switch (132) which is configured to switch between the first and second time portion from the first decoder (110a) to the second decoder (110b) so that the bandwidth extension algorithm is either applied to the first decoded signal (114a) or to the second decoded signal (114b).

20

4. The apparatus for decoding (100) of claim 3, wherein the controller (140) is configured to control the switch (132) dependent on the indicated decoding algorithm within the coding mode information (108).

25

5. The apparatus for decoding (100) of one of the preceding claims, wherein the controller (140) is configured to increase the crossover frequency (fx) within the first time portion or to decrease the crossover frequency (fx) within the second time portion.

30

35 6. An apparatus for encoding (200) an audio signal (105) comprising:

5 a first encoder (210a) which is configured to encode in accordance with a first encoding algorithm, the first encoding algorithm having a first frequency bandwidth, wherein the first encoder (210a) comprises an LPC-based coder;

10 a second encoder (210b) which is configured to encode in accordance with a second encoding algorithm, the second encoding algorithm having a second frequency bandwidth being smaller than the first frequency bandwidth, wherein the second encoder (210b) comprises a transform-based coder;

15 a decision stage (220) for indicating the first encoding algorithm for a first portion (204a) of the audio signal (105) and for indicating the second encoding algorithm for a second portion (204b) of the audio signal (105), the second portion (204b) being different from the first portion (204a); and

20 a bandwidth extension module (230) for calculating BWE parameters (106) for the audio signal (105), wherein the BWE module (230) is configured to be controlled by the decision stage (220) to calculate the BWE parameters (106) for a band not including the first frequency bandwidth in the first portion (204a) of the audio signal (105) and for a band not including the second frequency bandwidth in the second portion (204b) of the audio signal (105),

30 wherein the first or the second frequency bandwidth is defined by a variable crossover frequency (fx) and wherein the decision stage (220) is configured to output the variable crossover frequency (fx),

35 wherein the BWE module (230) is configured to use a first crossover frequency (fx1) for calculating the BWE parameters for a signal encoded using the first

encoder (210a) and to use a second crossover frequency (fx2) for a signal encoded using the second encoder (210b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2).

- 5
7. The apparatus for encoding (200) of claim 6, further comprising an output interface (800) for outputting the encoded audio signal (102), the encoded audio signal (102) comprising a first portion (104a) encoded in accordance with a first encoding algorithm, a
10 second portion (104b) encoded in accordance with a second encoding algorithm, BWE parameters (106) for the first portion (104a) and the second portion (104b) and coding mode information (108) indicating the first
15 decoding algorithm or the second decoding algorithm.
8. The apparatus for encoding (200) of claim 6 or claim 7, wherein the first or the second frequency bandwidth is defined by a variable crossover frequency (fx) and
20 wherein the decision stage (220) is configured to output the variable crossover frequency (fx).
9. The apparatus for encoding (200) of one of the claims 6 to 8, wherein the BWE module (230) comprises a
25 switch (232) controlled by the decision stage (220), wherein the switch (232) is configured to switch between the first and second time encoder (210a, 210b) so that the audio signal (105) is for different time portions either encoded by the first or by the second
30 encoder (210a, 210b).
10. The apparatus for encoding (200) of one of the claims 6 to 9, wherein the decision stage (220) is operative to analyze the audio signal (105) or a first output of
35 the first encoder (210a) or a second output of the second encoder (210b) or a signal obtained by decoding an output signal of the first encoder (210a) or the

second encoder (210b) with respect to a target function.

11. A method for decoding an encoded audio signal (102),
5 the encoded audio signal (102) comprising a first
portion (104a) encoded in accordance with a first
encoding algorithm, a second portion (104b) encoded in
accordance with a second encoding algorithm, BWE
parameters (106) for the first portion (104a) and the
10 second portion (104b) and a coding mode information
(108) indicating a first decoding algorithm or a
second decoding algorithm, the method comprising:

15 decoding the first portion (104a) in accordance with
the first decoding algorithm for a first time portion
of the encoded signal (102) to obtain a first decoded
signal (114a), wherein the step of decoding the first
portion comprises using an LPC-based coder;

20 decoding the second portion (104b) in accordance with
the second decoding algorithm for a second time
portion of the encoded signal (102) to obtain a second
decoded signal (114b), wherein the step of decoding
the second portion (104b) comprises using a transform-
25 based coder;

performing a bandwidth extension algorithm by a BWE
module (130) having a controllable crossover frequency
(fx), using the first decoded signal (114a) and the
30 BWE parameters (106) for the first portion (104a), and
performing, by the BWE module (130) having the
controllable crossover frequency (fx), a bandwidth
extension algorithm using the second decoded signal
(114b) and the bandwidth extension parameter (106) for
35 the second portion (104b),

wherein a first crossover frequency (fx1) is used for
the bandwidth extension for the first decoded signal

(114a) and a second crossover frequency (fx2) is used for the bandwidth extension for the second decoded signal (114b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2); and

controlling the crossover frequency (fx) for the BWE module (130) in accordance with the coding mode information (108).

12. A method for encoding an audio signal (105) comprising:

encoding in accordance with a first encoding algorithm, the first encoding algorithm having a first frequency bandwidth, wherein the step of encoding in accordance with a first encoding algorithm comprises using an LPC-based coder;

encoding in accordance with a second encoding algorithm, the second encoding algorithm having a second frequency bandwidth being smaller than the first frequency bandwidth, wherein the step of encoding in accordance with a second encoding algorithm comprises using a transform-based coder;

indicating the first encoding algorithm for a first portion (204a) of the audio signal (105) and the second encoding algorithm for a second portion (204b) of the audio signal (105), the second portion (204b) being different from the first portion (204a); and

calculating BWE parameters (106) for the audio signal (105) such that the BWE parameters (106) are calculated for a band not including the first frequency bandwidth in the first portion (204a) of the audio signal (105) and for a band not including the

second frequency bandwidth in the second portion (204b) of the audio signal (105),

5 wherein the first or the second frequency bandwidth is defined by a variable crossover frequency (fx),

10 wherein the BWE module (230) is configured to use a first crossover frequency (fx1) for calculating the BWE parameters for a signal encoded using the LPC-based coder and to use a second crossover frequency (fx2) for a signal encoded using the transform-based coder (210b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2).

15

13. An encoded audio signal (102) comprising:

20 a first portion (104a) encoded in accordance with a first encoding algorithm, the first encoding algorithm comprising an LPC-based coder;

25 a second portion (104b) encoded in accordance with a second different encoding algorithm, the second encoding algorithm comprising a transform-based coder;

bandwidth extension parameters (106) for the first portion (104a) and the second portion (104b); and

30 a coding mode information (108) indicating a first crossover frequency (fx1) used for the first portion (104a) or a second crossover frequency (fx2) used for the second portion (104b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2).

35

14. Computer program for performing, when running on a computer, the method of claim 13 or claim 14.

Claims

1. An apparatus for decoding (100) an encoded audio
signal (102), the encoded audio signal (102)
5 comprising a first portion (104a) encoded in
accordance with a first encoding algorithm, a second
portion (104b) encoded in accordance with a second
encoding algorithm, BWE parameters (106) for the first
portion (104a) and the second portion (104b) and a
10 coding mode information (108) indicating a first
decoding algorithm or a second decoding algorithm,
comprising:

15 a first decoder (110a) for decoding the first portion
(104a) in accordance with the first decoding algorithm
for a first time portion of the encoded signal (102)
to obtain a first decoded signal (114a), wherein the
first decoder (110a) comprises an LPC-based coder;

20 a second decoder (110b) for decoding the second
portion (104b) in accordance with the second decoding
algorithm for a second time portion of the encoded
signal (102) to obtain a second decoded signal (114b),
25 wherein the second decoder (110b) comprises a
transform-based coder;

a BWE module (130) having a controllable crossover
frequency (fx), the BWE module (130) being configured
for performing a bandwidth extension algorithm using
30 the first decoded signal (114a) and the BWE parameters
(106) for the first portion (104a), and for performing
a bandwidth extension algorithm using the second
decoded signal (114b) and the bandwidth extension
parameter (106) for the second portion (104b),
35 wherein the BWE module (130) is configured to use a
first crossover frequency (fx1) for the bandwidth
extension for the first decoded signal (114a) and to

use a second crossover frequency (fx2) for the bandwidth extension for the second decoded signal (114b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2); and

5

a controller (140) for controlling the crossover frequency (fx) for the BWE module (130) in accordance with the coding mode information (108).

10 2. The apparatus for decoding (100) of claim 1, further comprising an input interface (900) for inputting the encoded audio signal (102) as a bitstream.

15 3. The apparatus for decoding (100) of claim 1 or of claim 2, wherein the BWE module (130) comprises a switch (132) which is configured to switch between the first and second time portion from the first decoder (110a) to the second decoder (110b) so that the bandwidth extension algorithm is either applied to the
20 first decoded signal (114a) or to the second decoded signal (114b).

25 4. The apparatus for decoding (100) of claim 3, wherein the controller (140) is configured to control the switch (132) dependent on the indicated decoding algorithm within the coding mode information (108).

~~5. The apparatus for decoding (100) of one of the preceding claims, wherein the BWE module (130) is
30 configured to use a first crossover frequency (fx1) for the bandwidth extension for the first decoded signal (114a) and to use a second crossover frequency (fx2) for the bandwidth extension for the second decoded signal (114b), wherein the first crossover
35 frequency (fx1) is higher than the second crossover frequency (fx2).~~

65. The apparatus for decoding (100) of one of the preceding claims, wherein the controller (140) is configured to increase the crossover frequency (fx) within the first time portion or to decrease the crossover frequency (fx) within the second time portion.
- ~~7. The apparatus for decoding (100) of one of the preceding claims, wherein the first decoder (110a) comprise an LPC-based coder at wherein the second decoder (110b) comprises a transform-based coder.~~
86. An apparatus for encoding (200) an audio signal (105) comprising:
- a first encoder (210a) which is configured to encode in accordance with a first encoding algorithm, the first encoding algorithm having a first frequency bandwidth, wherein the first encoder (210a) comprises an LPC-based coder;
- a second encoder (210b) which is configured to encode in accordance with a second encoding algorithm, the second encoding algorithm having a second frequency bandwidth being smaller than the first frequency bandwidth, wherein the second encoder (210b) comprises a transform-based coder;
- a decision stage (220) for indicating the first encoding algorithm for a first portion (204a) of the audio signal (105) and for indicating the second encoding algorithm for a second portion (204b) of the audio signal (105), the second portion (204b) being different from the first portion (204a); and
- a bandwidth extension module (230) for calculating BWE parameters (106) for the audio signal (105), wherein the BWE module (230) is configured to be controlled by

the decision stage (220) to calculate the BWE parameters (106) for a band not including the first frequency bandwidth in the first portion (204a) of the audio signal (105) and for a band not including the second frequency bandwidth in the second portion (204b) of the audio signal (105),

wherein the first or the second frequency bandwidth is defined by a variable crossover frequency (fx) and wherein the decision stage (220) is configured to output the variable crossover frequency (fx),

wherein the BWE module (230) is configured to use a first crossover frequency (fx1) for calculating the BWE parameters for a signal encoded using the first encoder (210a) and to use a second crossover frequency (fx2) for a signal encoded using the second encoder (210b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2).

97. The apparatus for encoding (200) of claim 86, further comprising an output interface (800) for outputting the encoded audio signal (102), the encoded audio signal (102) comprising a first portion (104a) encoded in accordance with a first encoding algorithm, a second portion (104b) encoded in accordance with a second encoding algorithm, BWE parameters (106) for the first portion (104a) and the second portion (104b) and coding mode information (108) indicating the first decoding algorithm or the second decoding algorithm.

108. The apparatus for encoding (200) of claim 86 or claim 97, wherein the first or the second frequency bandwidth is defined by a variable crossover frequency (fx) and wherein the decision stage (220) is configured to output the variable crossover frequency (fx).

- 5

~~119~~. The apparatus for encoding (200) of one of the claims ~~8-6~~ to ~~108~~, wherein the BWE module (230) comprises a switch (232) controlled by the decision stage (220), wherein the switch (232) is configured to switch between the first and second time encoder (210a, 210b) so that the audio signal (105) is for different time portions either encoded by the first or by the second encoder (210a, 210b).
- 10

~~1210~~. The apparatus for encoding (200) of one of the claims ~~8-6~~ to ~~119~~, wherein the decision stage (220) is operative to analyze the audio signal (105) or a first output of the first encoder (210a) or a second output of the second encoder (210b) or a signal obtained by decoding an output signal of the first encoder (210a) or the second encoder (210b) with respect to a target function.
- 15

~~1311~~. A method for decoding an encoded audio signal (102), the encoded audio signal (102) comprising a first portion (104a) encoded in accordance with a first encoding algorithm, a second portion (104b) encoded in accordance with a second encoding algorithm, BWE parameters (106) for the first portion (104a) and the second portion (104b) and a coding mode information (108) indicating a first decoding algorithm or a second decoding algorithm, the method comprising:
- 20

decoding the first portion (104a) in accordance with the first decoding algorithm for a first time portion of the encoded signal (102) to obtain a first decoded signal (114a), wherein the step of decoding the first portion comprises using an LPC-based coder;
- 25

decoding the second portion (104b) in accordance with the second decoding algorithm for a second time portion of the encoded signal (102) to obtain a second
- 30
- 35

decoded signal (114b), wherein the step of decoding the second portion (104b) comprises using a transform-based coder;

5 ~~a BWE module (130) having a controllable crossover frequency (fx), the BWE module (130) being configured for~~

10 performing a bandwidth extension algorithm by a BWE module (130) having a controllable crossover frequency (fx), using the first decoded signal (114a) and the BWE parameters (106) for the first portion (104a), and ~~for~~ performing, by the BWE module (130) having the controllable crossover frequency (fx), a bandwidth extension algorithm using the second decoded signal (114b) and the bandwidth extension parameter (106) for the second portion (104b),

20 wherein a first crossover frequency (fx1) is used for the bandwidth extension for the first decoded signal (114a) and a second crossover frequency (fx2) is used for the bandwidth extension for the second decoded signal (114b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2); and

25 controlling the crossover frequency (fx) for the BWE module (130) in accordance with the coding mode information (108).

30 1412. A method for encoding an audio signal (105) comprising:

35 encoding in accordance with a first encoding algorithm, the first encoding algorithm having a first frequency bandwidth, wherein the step of encoding in accordance with a first encoding algorithm comprises using an LPC-based coder;

encoding in accordance with a second encoding
algorithm, the second encoding algorithm having a
second frequency bandwidth being smaller than the
5 first frequency bandwidth, wherein the step of
encoding in accordance with a second encoding
algorithm comprises using a transform-based coder;

10 indicating the first encoding algorithm for a first
portion (204a) of the audio signal (105) and the
second encoding algorithm for a second portion (204b)
of the audio signal (105), the second portion (204b)
being different from the first portion (204a); and

15 calculating BWE parameters (106) for the audio signal
(105) such that the BWE parameters (106) are
calculated for a band not including the first
frequency bandwidth in the first portion (204a) of the
audio signal (105) and for a band not including the
20 second frequency bandwidth in the second portion
(204b) of the audio signal (105),

wherein the first or the second frequency bandwidth is
defined by a variable crossover frequency (fx),

25 wherein the BWE module (230) is configured to use a
first crossover frequency (fx1) for calculating the
BWE parameters for a signal encoded using the LPC-
based coder and to use a second crossover frequency
30 (fx2) for a signal encoded using the transform-based
coder (210b), wherein the first crossover frequency
(fx1) is higher than the second crossover frequency
(fx2).

35 ~~15~~13. An encoded audio signal (102) comprising:

a first portion (104a) encoded in accordance with a first ~~eneeded~~ encoding algorithm, the first encoding algorithm comprising an LPC-based coder;

5 a second portion (104b) encoded in accordance with a second different encoding algorithm, the second encoding algorithm comprising a transform-based coder;

10 bandwidth extension parameters (106) for the first portion (104a) and the second portion (104b); and

15 a coding mode information (108) indicating a first crossover frequency (fx1) used for the first portion (104a) or a second crossover frequency (fx2) used for the second portion (104b), wherein the first crossover frequency (fx1) is higher than the second crossover frequency (fx2).

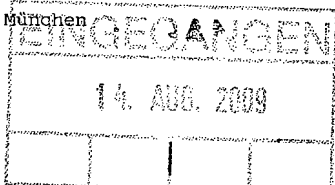
20 ~~1614.~~ Computer program for performing, when running on a computer, the method of claim 13 or claim 14.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCTNOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

To:

SCHOPPE, ZIMMERMANN, STÖCKELER & ZINKLER
Attn. Zinkler, Franz
Postfach 246
D-82043 Pullach bei München
ALLEMAGNE

(PCT Rule 44.1)

Date of mailing
(day/month/year)

13/08/2009

Applicant's or agent's file reference

FH090616PCT

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/EP2009/004522

International filing date

(day/month/year)

23/06/2009

Applicant

FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER ...

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70**For more detailed instructions,** see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Dana Schalinatus

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Volume I/A, Annexes B1 and B2).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, Volume I/A, paragraph 296).

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

If a demand for international preliminary examination is made, the written opinion of the International Searching Authority will, except in certain cases where the International Preliminary Examining Authority did not act as International Searching Authority and where it has notified the International Bureau under Rule 66.1 *bis*(b), be considered to be a written opinion of the International Preliminary Examining Authority. If a demand is made, the applicant may submit to the International Preliminary Examining Authority a reply to the written opinion 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 (Rule 43*bis*.1(c)).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide*, Volume II.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
FH090616PCT		
International application No.	International filing date (day/month/year)	(Earliest) Priority Date (day/month/year)
PCT/EP2009/004522	23/06/2009	11/07/2008
Applicant		
FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER ...		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out 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))

b. ☐ This international search report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (See Box No. II)

3. ☐ Unity of invention is lacking (see Box No III)

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant
☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☐ the text is approved as submitted by the applicant
☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. 1
☒ as suggested by the applicant
☐ as selected by this Authority, because the applicant failed to suggest a figure
☐ as selected by this Authority, because this figure better characterizes the invention
b. ☐ none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2009/004522

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

An apparatus for decoding (100) an encoded audio signal (102). A first decoder (110a) decodes a first portion (104a) in accordance with a first decoding algorithm for a first time portion of the encoded signal (102) to obtain a first decoded signal (114a). A second decoder (110b) decodes a second portion (104b) in accordance with a second decoding algorithm for a second time portion of the encoded signal (102) to obtain a second decoded signal (114b). A BWE module (130) has a controllable crossover frequency (fx) and is configured for performing a bandwidth extension algorithm using the first decoded signal (114a) and BWE parameters (106) for the first portion (104a), and for performing a bandwidth extension algorithm using the second decoded signal (114b) and the bandwidth extension parameters (106) for the second portion (104b). A controller (140) controls the crossover frequency (fx) for the BWE module (130) in accordance with a coding mode information (108).

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/004522

A. CLASSIFICATION OF SUBJECT MATTER INV. G10L19/14 G10L21/02		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) G10L		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, COMPENDEX, INSPEC, IBM-TDB		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/41302 A (CODING TECHNOLOGIES SWEDEN AB [SE]; HENN FREDRIK [SE]; EHRET ANDREAS []) 23 May 2002 (2002-05-23)	1-6,8-16
Y	page 3, line 8 - line 21 page 5, line 7 - line 10 page 5, line 24 - line 36 page 6, line 1 - line 12 page 7, line 1 - line 11 page 7, line 23 - line 34 figure 7	7
Y	US 2007/106502 A1 (KIM JUNGHOE [KR] ET AL) 10 May 2007 (2007-05-10) paragraphs [0051] - [0055] ----- -/--	7
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family		
Date of the actual completion of the international search 7 August 2009		Date of mailing of the international search report 13/08/2009
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Geißler, Christian

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/004522

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/046891 A (CODING TECHNOLOGIES SWEDEN AB [SE]; KJOERLING KRISTOFER [SE]; EKSTRAND) 5 June 2003 (2003-06-05) page 2, line 20 - line 24 page 3, line 19 - line 22 page 9, line 21 - page 10, line 2 page 15, line 10 - line 15 claim 15	1,8, 13-16
E	EP 2 077 551 A (DOLBY SWEDEN AB [SE]) 8 July 2009 (2009-07-08) paragraphs [0005], [0007], [0021], [0065] claim 9	1,8, 13-16
E	WO 2009/081315 A (KONINKL PHILIPS ELECTRONICS NV [NL]; DEN BRINKER ALBERTUS C [NL]; VAN) 2 July 2009 (2009-07-02) page 3, line 1 - line 15 page 4, line 17 - line 28 page 8, line 19 - line 25	1,8, 13-16

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2009/004522

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0241302	A	23-05-2002	AT 267445 T	15-06-2004
			AU 1528202 A	27-05-2002
			CN 1475010 A	11-02-2004
			DE 60103424 D1	24-06-2004
			DE 60103424 T2	16-06-2005
			DK 1334484 T3	09-08-2004
			EP 1334484 A1	13-08-2003
			ES 2218462 T3	16-11-2004
			HK 1058096 A1	04-02-2005
			JP 3983668 B2	26-09-2007
			JP 2004514180 T	13-05-2004
			JP 2007293354 A	08-11-2007
			PT 1334484 E	30-09-2004
			TR 200401631 T4	21-09-2004
			US 2002103637 A1	01-08-2002
US 2007106502	A1	10-05-2007	CN 101305423 A	12-11-2008
			EP 1952400 A1	06-08-2008
			WO 2007055507 A1	18-05-2007
WO 03046891	A	05-06-2003	AT 288617 T	15-02-2005
			AU 2002352182 A1	10-06-2003
			CN 1571993 A	26-01-2005
			DE 60202881 D1	10-03-2005
			DE 60202881 T2	19-01-2006
			EP 1423847 A1	02-06-2004
			ES 2237706 T3	01-08-2005
			HK 1062350 A1	20-05-2005
			JP 3870193 B2	17-01-2007
			JP 2005510772 T	21-04-2005
			PT 1423847 E	31-05-2005
			US 2009132261 A1	21-05-2009
			US 2005096917 A1	05-05-2005
EP 2077551	A	08-07-2009	EP 2077550 A1	08-07-2009
			WO 2009086918 A1	16-07-2009
			WO 2009086919 A1	16-07-2009
WO 2009081315	A	02-07-2009	NONE	

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

To:		see form PCT/ISA/220	
Date of mailing (day/month/year) see form PCT/ISA/210 (second sheet)			
Applicant's or agent's file reference see form PCT/ISA/220		FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/EP2009/004522	International filing date (day/month/year) 23.06.2009	Priority date (day/month/year) 11.07.2008	
International Patent Classification (IPC) or both national classification and IPC INV. G10L19/14 G10L21/02			
Applicant FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER ...			
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 or 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 usually 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. 3. For further details, see notes to Form PCT/ISA/220.			
Name and mailing address of the ISA:		Date of completion of this opinion	Authorized Officer
 European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465		see form PCT/ISA/210	Geißler, Christian Telephone No. +49 89 2399-4796 

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/EP2009/004522

Box No. I Basis of the 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 and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in electronic form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/EP2009/004522

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)	Yes: Claims	<u>3,4,7,11</u>
	No: Claims	<u>1,2,5,6,8-10,12-16</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-16</u>
Industrial applicability (IA)	Yes: Claims	<u>1-16</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43bis.1 and 70.10)

and /or

2. Non-written disclosures (Rules 43bis.1 and 70.9)

see form 210

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)

International application No.

PCT/EP2009/004522

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial
applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1: WO0241302 A1

D2: US2007106502 A1

2 Claim 8

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of present independent encoding apparatus claim 8 is **not new** in the sense of Article 33(2) PCT.

International Search Report Document D1 discloses, applying the wording of claim 8:

"An apparatus for encoding an audio signal (D1, title) comprising:

a first encoder which is configured to encode in accordance with a first encoding algorithm, the first encoding algorithm having a first frequency bandwidth (D1, p. 3, l. 8-10);

a second encoder which is configured to encode in accordance with a second encoding algorithm, the second encoding algorithm having a second frequency bandwidth being smaller than the first frequency bandwidth (D1, p. 3, l. 10-14 and l. 18-21);

a decision stage for indicating the first encoding algorithm for a first portion of the audio signal and for indicating the second encoding algorithm for a second portion of the audio signal, the second portion being different from the first portion (D1, p. 3, l. 12-14 and l. 19-21; p. 5, l. 7-10, l. 24-25 and l. 30-34; p. 6, l. 1-4 and l. 9-11; p. 7, l. 2-7); and

a bandwidth extension module for calculating BWE parameters for the audio signal, wherein the BWE module is configured to be controlled by the decision stage to calculate the BWE parameters for a band not including the first frequency bandwidth in the first portion of the audio signal and for a band not including the second frequency bandwidth in the second portion of the audio signal (D1, p. 3, l. 12-14 and l. 19-21; p. 5, l. 7-10; p. 7, l. 2-7)."

Consequently, D1 anticipates the subject-matter of present independent claim 8, which therefore fails to be novel (Art. 33(2) PCT).

3 Claim 1

The subject-matter of present independent claim 1 represents a decoding apparatus inter-related to the non-novel independent encoding apparatus of claim 8. Claim 1 is, combined with the passages of D1 cited for claim 8 above, also disclosed in D1, cf. p. 7, l. 23-34. Thus the subject-matter of claim 1 also **lacks novelty** (Art. 33(2) PCT).

4 Claims 2, 5, 6, 9, 10 and 12

The subject-matters of present dependent apparatus claims 2, 5, 6, 9, 10 and 12 are **not new** in the sense of Article 33(2) PCT, because the additional features of these claims are also disclosed in D1 as follows:

Claims 2 and 9 (interface/bitstream):	D1, p. 7, l. 23-25
Claims 5, 6 and 10 (crossover freq.):	D1, p. 7, l. 28-29 in combination with p. 5, l. 8-10 or l. 30-34
Claim 12 (target function):	D1, p. 5, l. 24-36

5 Claims 3, 4 and 11

Although in D1 the decoder is realized as a single apparatus which is parameterized by the received crossover frequency (cf. D1, p. 7, l. 28-29 and Fig. 7, block 705) it is

considered a mere design option to realize the (single) decoder with variable crossover frequency as an arrangement of two separate decoders with different crossover frequencies. Therefore realizing the decoding apparatus as one (as in D1) vs. two (as in claims 3 and 4) decoders are simply two straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill.

The same holds true for inter-related dependent encoding apparatus claim 11. Consequently the subject-matters of claims 3, 4 and 11 **lack an inventive step** (Art. 33(3) PCT).

6 Claim 7

The subject-matter of present dependent apparatus claim 7 does **not involve an inventive step** in the sense of Article 33(3) PCT for the following reasons:

Starting from the decoding apparatus of D1, the skilled person will be aware of the problem to optimize coding/decoding for different types of audio signals with different properties. He will then know from Document D2 that such a problem can be solved by:

"wherein the first decoder comprises an LPC-based coder and wherein the second decoder comprises a transform-based coder (cf. D2, par. [0051]-[0055])."

This is exactly the solution proposed in present claim 7. Therefore the subject-matter of claim 7 fails to fulfill the requirements under the PCT for lack of an inventive step (Art. 33(3) PCT).

7 Claims 13-16

Present independent claims 13 (decoding method), 14 (encoding method), 15 (audio signal) and 16 (computer program) correspond to present non-novel independent apparatus claims 1 and 8, respectively. Therefore the subject-matters of claims 13-16 fail to fulfill the requirements under the PCT for the same reasons already explained

for claims 1 and 8, respectively (**lack of novelty**, Art. 33(2) PCT).

Re Item VI
Certain documents cited

Certain published documents

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
EP2077551 A1	08/07/2009	24/05/2008	04/01/2008
WO2009081315 A1	02/07/2009	12/12/2008	18/12/2007

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information	For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.
Amending claims under Art. 19 PCT	Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.
Filing a demand for international preliminary examination	In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/ WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT). If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).
Filing informal comments	After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.
End of the international phase	At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPER (international preliminary examination report).
Relevant PCT Rules and more information	Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003

30. SEP. 2009

PCT

From the INTERNATIONAL BUREAU

To:

ZINKLER, Franz
Schoppe, Zimmermann, Stöckeler & Zinkler
Postfach 246
82043 Pullach bei München
ALLEMAGNE

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

Date of mailing (day/month/year) 22 September 2009 (22.09.2009)	
Applicant's or agent's file reference FH090616PCT	IMPORTANT NOTIFICATION
International application No. PCT/EP2009/004522	International filing date (day/month/year) 23 June 2009 (23.06.2009)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 11 July 2008 (11.07.2008)
Applicant FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E. V. et al	

1. By means of this Form, which replaces any previously issued notification concerning submission or transmittal of priority documents, the applicant is hereby notified of the date of receipt by the International Bureau of the priority document(s) relating to all earlier application(s) whose priority is claimed. Unless otherwise indicated by the letters "NR", in the right-hand column or by an asterisk appearing next to a date of receipt, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. (If applicable) The letters "NR" appearing in the right-hand column denote a priority document which, on the date of mailing of this Form, had not yet been received by the International Bureau under Rule 17.1(a) or (b). Where, under Rule 17.1(a), the priority document must be submitted by the applicant to the receiving Office or the International Bureau, but the applicant fails to submit the priority document within the applicable time limit under that Rule, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
3. (If applicable) An asterisk (*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b) (the priority document was received after the time limit prescribed in Rule 17.1(a) or the request to prepare and transmit the priority document was submitted to the receiving Office after the applicable time limit under Rule 17.1(b)). Even though the priority document was not furnished in compliance with Rule 17.1(a) or (b), the International Bureau will nevertheless transmit a copy of the document to the designated Offices, for their consideration. In case such a copy is not accepted by the designated Office as the priority document, Rule 17.1(c) provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
11 July 2008 (11.07.2008)	61/079,841	US	21 September 2009 (21.09.2009)
08 October 2008 (08.10.2008)	61/103,820	US	21 September 2009 (21.09.2009)

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Muller Antonia e-mail pt05.pct@wipo.int Telephone No. +41 22 338 74 05
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FH090616PCT

1/6

PCT REQUEST

Original (for SUBMISSION)

0	For receiving Office use only	
0-1	International Application No.	PCT/EP 2009 / 0 0 4 5 2 2
0-2	International Filing Date	23 JUN 2009 (23. 06. 09)
0-3	Name of receiving Office and "PCT International Application"	RO/EP
0-4	Form PCT/RO/101 PCT Request	
0-4-1	Prepared Using	PCT-SAFE [EASY model] Version 3.51.038.214 MT/FOP 20090301/0.20.5.15
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	European Patent Office (EPO) (RO/EP)
0-7	Applicant's or agent's file reference	FH090616PCT
I	Title of Invention	AN APPARATUS AND A METHOD FOR DECODING AN ENCODED AUDIO SIGNAL
II	Applicant	
II-1	This person is	applicant only
II-2	Applicant for	all designated States except US
II-4	Name	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.
II-5	Address	Hansastraße 27c 80686 Muenchen Germany
II-6	State of nationality	DE
II-7	State of residence	DE
III-1	Applicant and/or inventor	
III-1-1	This person is	applicant and inventor
III-1-2	Applicant for	US only
III-1-4	Name (LAST, First)	NEUENDORF, Max
III-1-5	Address	Theatergasse 17 90402 Nuernberg Germany
III-1-6	State of nationality	DE
III-1-7	State of residence	DE

PCT REQUEST

Original (for SUBMISSION)

III-2	Applicant and/or inventor	applicant and inventor US only GRILL, Bernhard Peter-Henlein-Strasse 7 91207 Lauf Germany DE DE
III-2-1	This person is	
III-2-2	Applicant for	
III-2-4	Name (LAST, First)	
III-2-5	Address	
III-2-6	State of nationality	
III-2-7	State of residence	
III-3	Applicant and/or inventor	applicant and inventor US only KRAEMER, Ulrich Milloecker Strasse 5 70195 Stuttgart Germany DE DE
III-3-1	This person is	
III-3-2	Applicant for	
III-3-4	Name (LAST, First)	
III-3-5	Address	
III-3-6	State of nationality	
III-3-7	State of residence	
III-4	Applicant and/or inventor	applicant and inventor US only MULTRUS, Markus Etzlaubweg 7 90469 Nuernberg Germany DE DE
III-4-1	This person is	
III-4-2	Applicant for	
III-4-4	Name (LAST, First)	
III-4-5	Address	
III-4-6	State of nationality	
III-4-7	State of residence	
III-5	Applicant and/or inventor	applicant and inventor US only POPP, Harald Obermichelbacher Strasse 18 90587 Tuchenbach Germany DE DE
III-5-1	This person is	
III-5-2	Applicant for	
III-5-4	Name (LAST, First)	
III-5-5	Address	
III-5-6	State of nationality	
III-5-7	State of residence	

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III-6	Applicant and/or inventor	
III-6-1	This person is	applicant and inventor
III-6-2	Applicant for	US only
III-6-4	Name (LAST, First)	RETTELBACH, Nikolaus
III-6-5	Address	Spessartstrasse 38 90427 Nuernberg Germany
III-6-6	State of nationality	DE
III-6-7	State of residence	DE
III-7	Applicant and/or inventor	
III-7-1	This person is	applicant and inventor
III-7-2	Applicant for	US only
III-7-4	Name (LAST, First)	NAGEL, Frederik
III-7-5	Address	Wilhelmshavener Strasse 72 90425 Nuernberg Germany
III-7-6	State of nationality	DE
III-7-7	State of residence	DE
III-8	Applicant and/or inventor	
III-8-1	This person is	applicant and inventor
III-8-2	Applicant for	US only
III-8-4	Name (LAST, First)	LOHWASSER, Markus
III-8-5	Address	Westpreussenstrasse 3b 91217 Hersbruck Germany
III-8-6	State of nationality	DE
III-8-7	State of residence	DE
III-9	Applicant and/or inventor	
III-9-1	This person is	applicant and inventor
III-9-2	Applicant for	US only
III-9-4	Name (LAST, First)	GAYER, Marc
III-9-5	Address	Falkenauer Strasse 3 91058 Erlangen Germany
III-9-6	State of nationality	DE
III-9-7	State of residence	DE

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III-10	Applicant and/or inventor	
III-10-1	This person is	applicant and inventor
III-10-2	Applicant for	US only
III-10-4	Name (LAST, First)	JANDER, Manuel
III-10-5	Address	Liebigstrasse 2 91052 Erlangen Germany
III-10-6	State of nationality	DE
III-10-7	State of residence	DE
III-11	Applicant and/or inventor	
III-11-1	This person is	applicant and inventor
III-11-2	Applicant for	US only
III-11-4	Name (LAST, First)	BACIGALUPO, Virgilio
III-11-5	Address	Quellweg 9 90427 Nuernberg Germany
III-11-6	State of nationality	IT
III-11-7	State of residence	DE
IV-1	Agent or common representative; or address for correspondence The person identified below is hereby/ has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name (LAST, First)	ZINKLER, Franz
IV-1-2	Address	SCHOPPE, ZIMMERMANN, STOECKELER & ZINKLER P.O. Box 246 82043 Pullach Germany
IV-1-3	Telephone No.	089/7904450
IV-1-4	Facsimile No.	089/7902215
IV-1-5	e-mail	mail@schoppe-zimmermann.com
IV-2	Additional agent(s)	additional agent(s) with same address as first named agent
IV-2-1	Name(s)	ZIMMERMANN, Tankred; STÖCKELER, Ferdinand; SCHENK, Markus; SCHOPPE, Fritz; BURGER, Markus; GÖTTLING, Stefan

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V	DESIGNATIONS		
V-1	The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.		
VI-1	Priority claim of earlier national application		
VI-1-1	Filing date	11 July 2008 (11.07.2008)	
VI-1-2	Number	61/079,841	
VI-1-3	Country	US	
VI-2	Priority claim of earlier national application		
VI-2-1	Filing date	10 August 2008 (10.08.2008)	
VI-2-2	Number	61/103,820	
VI-2-3	Country	US	
VI-3	Incorporation by reference : where an element of the international application referred to in Article 11(1)(iii)(d) or (e) or a part of the description, claims or drawings referred to in Rule 20.5(a) is not otherwise contained in this international application but is completely contained in an earlier application whose priority is claimed on the date on which one or more elements referred to in Article 11(1)(iii) were first received by the receiving Office, that element or part is, subject to confirmation under Rule 20.6, incorporated by reference in this international application for the purposes of Rule 20.6.		
VII-1	International Searching Authority Chosen	European Patent Office (EPO) (ISA/EP)	
VIII	Declarations	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	-	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	-	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	-	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	-	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	-	

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IX	Check list	number of sheets	electronic file(s) attached
IX-1	Request (including declaration sheets)	6	✓
IX-2	Description	30	-
IX-3	Claims	6	-
IX-4	Abstract	1	✓
IX-5	Drawings	9	-
IX-7	TOTAL	52	
	Accompanying Items	paper document(s) attached	electronic file(s) attached
IX-8	Fee calculation sheet	✓	-
IX-18	PCT-SAFE physical media	-	✓
IX-20	Figure of the drawings which should accompany the abstract	1	
IX-21	Language of filing of the international application	English	
X-1	Signature of applicant, agent or common representative	 ZINKLER, Franz	
X-1-1	Name (LAST, First)		
X-1-2	Name of signatory		
X-1-3	Capacity		

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10-1	Date of actual receipt of the purported international application	23 JUN 2009 (23. 06. 09)
10-2	Drawings:	✓
10-2-1	Received	
10-2-2	No receipt	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
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