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SILICON VALLEY · NEW YORK · ATLANTA · WASHINGTON, D.C.

Patent Owner's Presentation
IPR2022-01086
U.S. Patent No. 8,605,794

Unified Patents, LLC v. VL Collective IP LLC

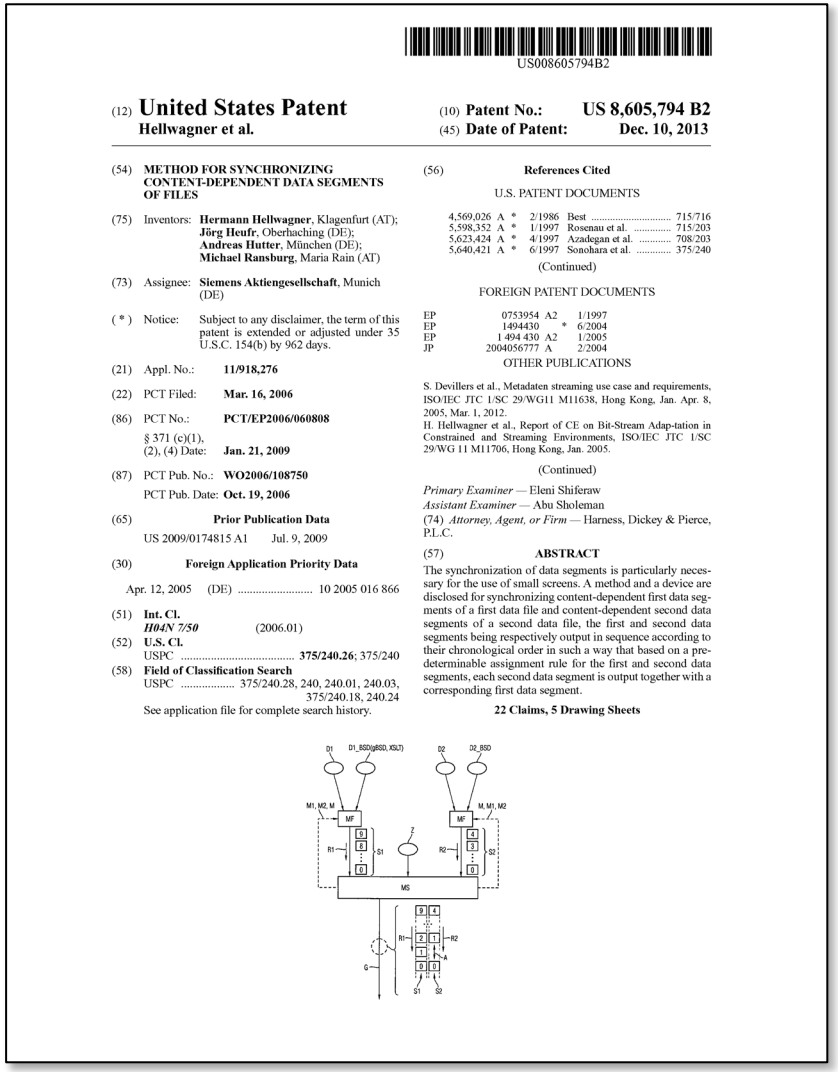
September 19, 2023

Statutory Grounds for Challenges

Ground	Assertion	Petitioned Claims
1	Anticipation by Abbott	1, 3, 5, 9, 12, 13, 15, 20, and 21
2	Obviousness in view of Abbott	1, 3, 5, 9, 12, 13, 15, 20, and 21
3	Anticipation by Sonohara	1, 3, 5, 9, 12, 13, 15, 20, and 21
4	Obviousness in view of Sonohara	1, 3, 5, 9, 12, 13, 15, 20, and 21

Paper 2, Petition, at 3-4

’794 Patent



US008605794B2

(12) **United States Patent**
Hellwagner et al.

(10) **Patent No.: US 8,605,794 B2**
(45) **Date of Patent: Dec. 10, 2013**

(54) **METHOD FOR SYNCHRONIZING CONTENT-DEPENDENT DATA SEGMENTS OF FILES**

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(73) Assignee: **Siemens Aktiengesellschaft**, Munich (DE)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 962 days.

(21) Appl. No.: **11/918,276**

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§ 371 (c)(1),
(2), (4) Date: **Jan. 21, 2009**

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PCT Pub. Date: **Oct. 19, 2006**

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Apr. 12, 2005 (DE) 10 2005 016 866

(51) **Int. Cl.**
H04N 7/50 (2006.01)

(52) **U.S. Cl.**
USPC **375/240.26**; 375/240

(58) **Field of Classification Search**
USPC 375/240.28, 240, 240.01, 240.03, 375/240.18, 240.24
See application file for complete search history.

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(Continued)

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(57) **ABSTRACT**

The synchronization of data segments is particularly necessary for the use of small screens. A method and a device are disclosed for synchronizing content-dependent first data segments of a first data file and content-dependent second data segments of a second data file, the first and second data segments being respectively output in sequence according to their chronological order in such a way that based on a predeterminable assignment rule for the first and second data segments, each second data segment is output together with a corresponding first data segment.

22 Claims, 5 Drawing Sheets

Title: Method for Synchronizing Content-Dependent Data Segments

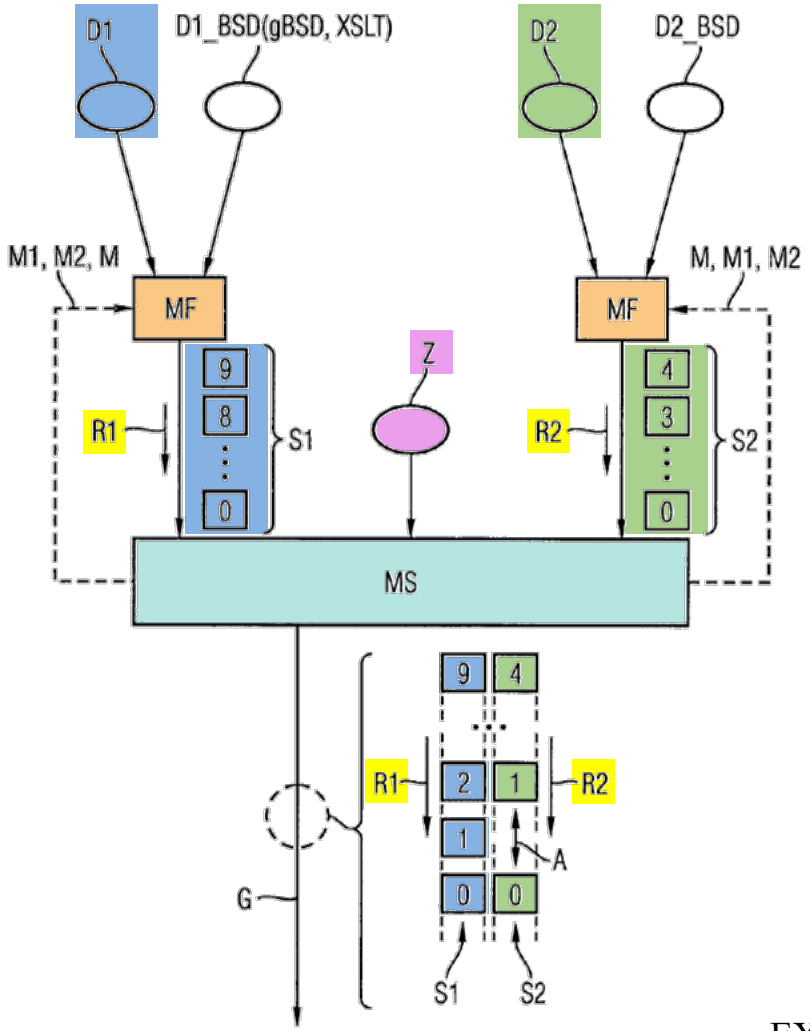
Assignee: Siemens Aktiengesellschaft

Priority Date: April 12, 2005 (Foreign)
March 16, 2006 (PCT)

Petitioned Claims: 1, 3, 5, 9, 12, 13, 15, 20, and 21

EX1001, ’794 Patent, Cover Page; Paper 2, Petition, at 3-4

’794 Patent

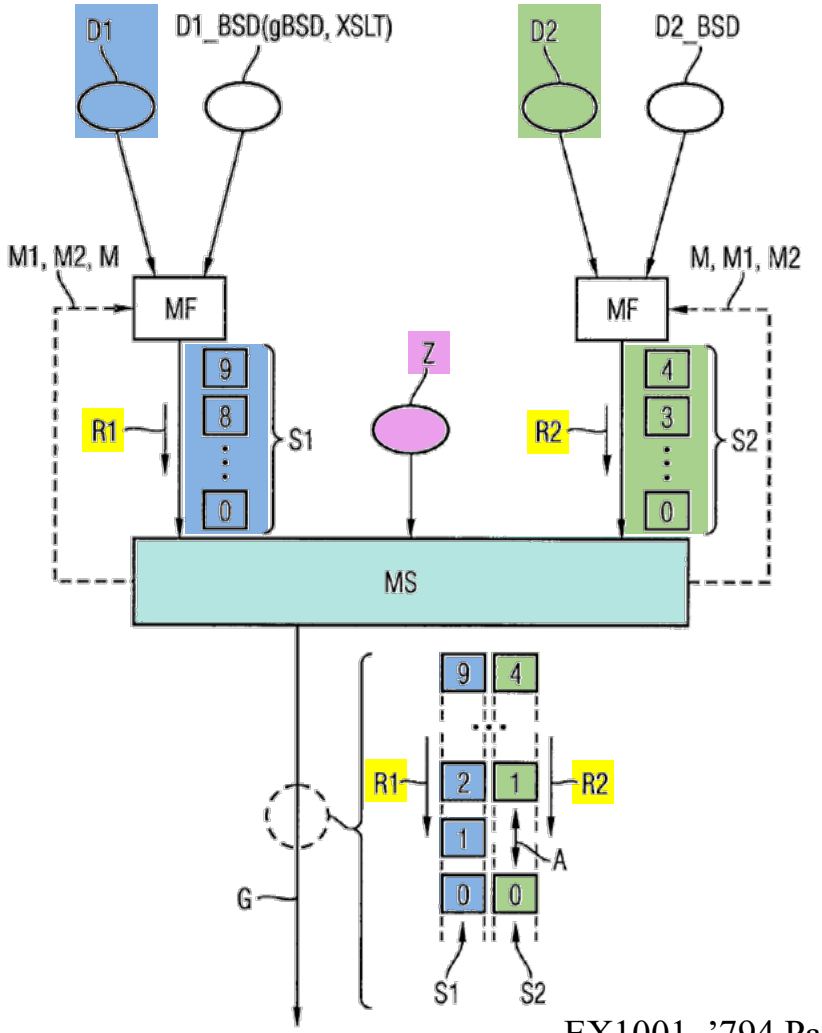


EX1001, ’794 Patent, Fig. 1; Paper 20, POR, at 6

’794 Patent

1. A method for synchronizing content-related first data segments of a first data file and content-related second data segments of a second data file, the method comprising:

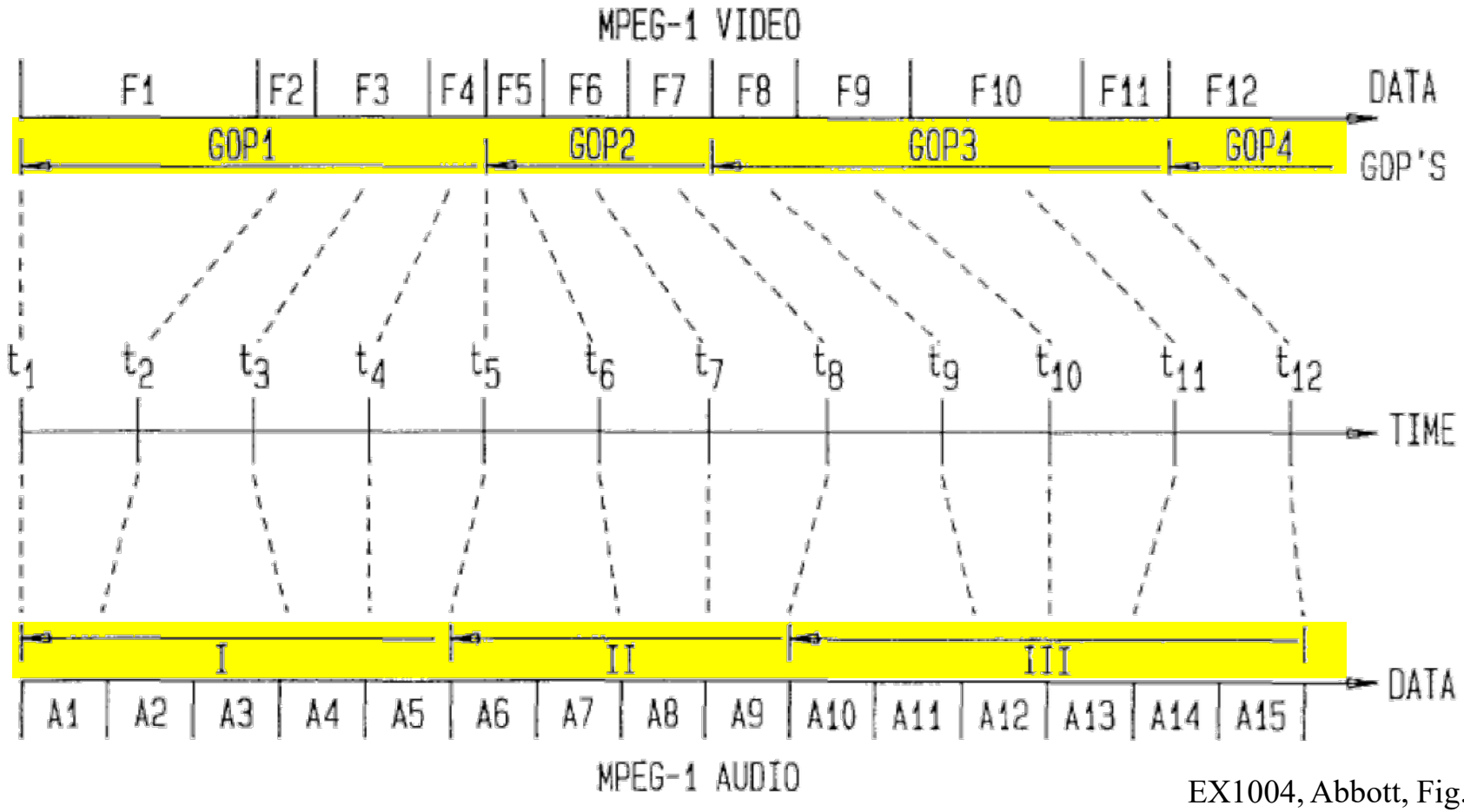
sequentially outputting, by a device for synchronizing content-related data, the content-related first data segments according to their chronological sequence in such a way that each of the content-related second data segments is output together with an associated one of the content-related first data segments on the basis of an assignment rule for assigning each one of the content-related second data segments to one of the content-related first data segments.



EX1001, ’794 Patent, Fig. 1, Claim 1; Paper 20, POR, at 7

Abbott: Indexes

FIG. 9



EX1004, Abbott, Fig. 9; Paper 20, POR, at 10

Abbott: Indexes

As shown in FIG. **9**, GOP1 spans the time interval from t_1 to t_5. Audio frames **A1**, **A2**, **A3**, **A4**, and **A5** (set I shown in FIG. **9**) come closest to spanning this same time interval. In accordance with the synchronization method of the present invention, audio frames **A1**, **A2**, **A3**, **A4**, and **A5** are assigned unique index numbers, but each of these index numbers points to the same atom-relative byte position that is the beginning of audio frame **A1**. Likewise, GOP2 spans the time interval from t_5 to t_8. Audio frames **A6**, **A7**, **A8**, and **A9** (set II shown in FIG. **9**) come closest to spanning this same time interval. In accordance with the synchronization method of the present invention, audio frames **A6** through **A9** are assigned unique index numbers, but each of these index numbers points to the same atom-relative byte position that is the beginning of audio frame **A6**. The same methodology would apply so that unique index numbers are assigned to audio frames **A10–A15** (set III shown in FIG. **9**), but each of these index numbers points to the same atom-relative byte position that is the beginning of audio frame **A10**. The index numbers and corresponding atom-relative byte positions for the audio are thus selected to most closely match the GOP pattern in the corresponding video.

EX1004, Abbott, 19:18-39;
Paper 20, POR, at 42

Abbott: Indexes Used Only When Jumping and Only Once

3. Media Stream Indexing

Conventional media delivery systems, such as conventional video-on-demand systems, do not provide a way for a viewer to skip or jump to selected points in the program material. Conventional media delivery systems also do not allow the viewer to view the program material in special modes such as slow motion, still, pause, single-frame advance, fast-forward, reverse, etc. Instead, with conventional systems, a viewer is forced to watch or view the program material in conventional playback mode as it is being transmitted by the media provider. The present invention provides a system and method for allowing a viewer to control delivery of the program material to jump or skip (either forward or backward) to selected points in the program material. Additionally, the present invention allows a viewer to view the program material in any of the above-defined special modes, as well as in a conventional playback mode.

EX1004, Abbott, 12:48-64;
Paper 20, POR, at 43

Abbott: Indexes Used Only When Jumping and Only Once

The indexing method of the present invention allows a viewer to skip to an arbitrary point in time in an item of program material. Without an index file to convert from program material-relative time to atom-relative byte position, program material data in an atom could only be accessed sequentially from the beginning to the end. It would not be possible to jump or skip to an arbitrary time point in the program material because the location of the program material data corresponding to that arbitrary time point would not be known.

EX1004, Abbott, 15:55-64;
Paper 20, POR, at 43

Abbott: Indexes Used Only When Jumping and Only Once

When jumping to various points in an item of program material, the indexing method of the present invention ensures that a jump is made to the beginning of a GOP. To prevent audio data from being "out of sync", it is necessary to correlate the corresponding audio data to each GOP. To do so, an index file for the video data is constructed first. As discussed above with respect to FIG. **9**, an index file for the video data would contain repeated atom-relative byte positions for the frames within GOP**1**, repeated atom-relative byte positions for the frames within GOP**2**, repeated atom-relative byte positions for the frames within GOP**3**, etc. Such a video data index file is then used to construct an index file for the corresponding audio data. An audio data index file is constructed so that, for the set of audio frames that most closely spans the time interval spanned by each GOP, each audio frame in that set is assigned the same atom-relative byte position. The assigned atom-relative byte position is the beginning of the set of audio frames. This synchronization method is illustrated in FIG. **9**.

EX1004, Abbott, 18:66-19:17;
Paper 26, POSR, at 17

Abbott: Indexes Used Only When Jumping and Only Once

4. Media Stream Synchronization

Audio and video data typically have different frame rates, and therefore, generally have different index rates. Thus, it is necessary to correlate the audio data with the corresponding video data to ensure that the audio and video remain synchronized. The media stream synchronization method of the present invention ensures that the data from every series in a group starts out in synchrony, and remains in synchrony after any repositioning of the viewpoint within the program material. Without synchronization, a viewer would perceive

EX1004, Abbott, 18:48-57

Abbott: Indexes Used Only When Jumping and Only Once

In a step **1010**, a base atom index file is constructed that defines base atom index boundaries for the base atom. By index boundary is meant a location in the program material to which a viewer is permitted to jump, and at which atom-relative byte position changes to a different value. In the example illustrated in FIG. **9**, the index boundaries for a base atom containing MPEG-1 video data are the boundaries defined by the GOPs.

EX1004, Abbott, 19:65-20:5; Paper 20, POR, at 43

Abbott: Indexes Used Only When Jumping and Only Once

Using the synchronization method of the present invention, the offset or "out of sync" time between audio and video is generally held to be within one frame duration, typically approximately 1/30 sec. One frame time out of synchrony is within a tolerable limit because a decoder that receives program material from a media provider is typically capable of resynchronizing such an offset. Without the synchronization method of the present invention, the offset time is typically on the order of one GOP duration. Since GOPs can contain on the order of 15 frames, the offset between audio and video without the synchronizing method of the present invention can be on the order of ½ sec. Such an offset is not tolerable because a decoder cannot resynchronize at the receiving end. Thus, the present invention helps ensure end-to-end synchrony.

EX1004, Abbott, 19:40-54

Abbott: Indexes Used Only When Jumping and Only Once

For example, Patent Owner may argue that *Abbott* does not explicitly disclose that the video data segments and audio data segments are output *sequentially*, but this would have been obvious to a POSITA at the time of the '794 Patent, as a POSITA would have recognized that media data is intended to be output *sequentially* – for example, it would be logical to a POSITA that "the audio and video tracks of a movie" would be output in sequence, from the start of the movie to the end. Even if the viewer were "to skip to an arbitrary point in time in an item of program material," (*Abbott* (EX1004), 15:55–57) after skipping to that time, the content at that point in time would be output and presented *sequentially*, in time order. Freedman (EX1005), ¶¶ 94–97. This would have been no more than common sense at the time of the '794 Patent, given a POSITA's background knowledge in delivery of multimedia content. *Id*.

Paper 2, Petition, 28-29

’794 Patent: Assignment Rule Applies for “Each” Data Segment

1. A method for synchronizing content-related first data segments of a first data file and content-related second data segments of a second data file, the method comprising:

sequentially outputting, by a device for synchronizing content-related data, the content-related first data segments and the content-related second data segments according to their chronological sequence in such a way that each of the content-related second data segments is output together with an associated one of the content-related first data segments on the basis of an assignment rule for assigning each one of the content-related second data segments to one of the content-related first data segments.

EX1001, ’794 Patent, Claim 1; Paper 20, POR, at 7

’794 Patent: Claim Construction

“content-related . . . data segments”

All petitioned claims

Patent Owner’s Proposed Construction
Definitional Construction: data segments that have a syntactical meaning within the respective data file Preferred Construction: data segments ordered in a file such that they will present the file’s contents in their intended presentation order when rendered sequentially

Paper 20, Patent Owner Response, at 14, 20-21

’794 Patent: Express Inventor Lexicography

For every first and second data file D**1**, D**2** there exists in each case a fragmentation description file D**1**_BSD, B**2**_BSD. Said fragmentation description file D**1**_BSD, B**2**_BSD specifies how content-related first and content-related second data segments S**1**, S**2** can be obtained from the respective first and second data file D**12**, D**2**. The term “content-related” is understood to mean that first and second data segments have a syntactical meaning within the respective data file, such as e.g. a plurality of succeeding second data segments represent the speech signal of a specific speaker within a dialog sequence. Furthermore, sections of the data file can also be understood thereby, such as e.g. individual images of a video sequence. In the following description data segments always refer to content-based data segments.

EX1001, ’794 Patent, 4:9-22; Paper 20, POR, at 15

Petitioner Agrees the Term Is Defined

In district court litigation, PO construed "content-related…data segments" in the same manner it proposes here. EX2005, 9. The district court rejected that construction and construed "content-related…data segments" as "segments of content data that have a syntactical meaning within the respective data file," based on the specification's description (EX1001, 4:14-17) that "content-related…mean[s] that first and second data segments have a syntactical meaning within the respective data file." EX2009, 4 (court's construction); EX1018, 111:24-112:1 (Judge Nall: "I'm going to adopt…the express definition provided in the specification.") (relying on definition in EX1001, 4:14-17). If the Board construes "content-related…data segments," the Board should adopt the same definitional construction the district court adopted. EX2009, 4; EX1016, ¶¶28-29, 31-34 (Dr. Freedman explaining

Paper 23, Petitioner's Reply, at 5-6

Petitioner's Expert Agrees the Term Is Defined

syntactical meaning within the respective data file." EX1001, 4:14-17. Thus, if the terms "content-related…data segments" are to be construed, they should be construed to mean "that first and second data segments have a syntactical meaning within the respective data file." EX1001, 4:14-17. I understand that a district court judge in a case involving the '794 Patent construed the "content-related…data segments" terms to mean "segments of content data that have a syntactical meaning within the respective data file." EX2009, 4.

29. I agree with Dr. Goodrich that the phrase "[t]he term 'content-related] is understood to mean that the first and second data segments have a syntactical meaning within the respective data file" is a definition provided in the '794 Patent for the term "content-related." EX2007, ¶57 (citing EX1001, 4:14-17). During my

EX1017, Dr. Freedman Supp. Declaration, ¶¶ 28-29

"Syntactical Meaning" Requires a Particular Order

For every first and second data file D1, D2 there exists in each case a fragmentation description file D1_BSD, B2_BSD. Said fragmentation description file D1_BSD, B2_BSD specifies how content-related first and content-related second data segments S1, S2 can be obtained from the respective first and second data file D12, D2. The term "content-related" is understood to mean that first and second data segments have a syntactical meaning within the respective data file, such as e.g. a plurality of succeeding second data segments represent the speech signal of a specific speaker within a dialog sequence. Furthermore, sections of the data file can also be understood thereby, such as e.g. individual images of a video sequence. In the following description data segments always refer to content-based data segments.

EX1001, '794 Patent, 4:9-22; Paper 20, POR, at 15

"Syntactical Meaning" Requires a Particular Order

sequence R1 in which they are to be output. By the first data segments S1 is meant data segments of the first data file D1 which have a content-related meaning for the first data file D1, such as e.g. individual images in a video sequence or individual spoken words in an audio sequence.

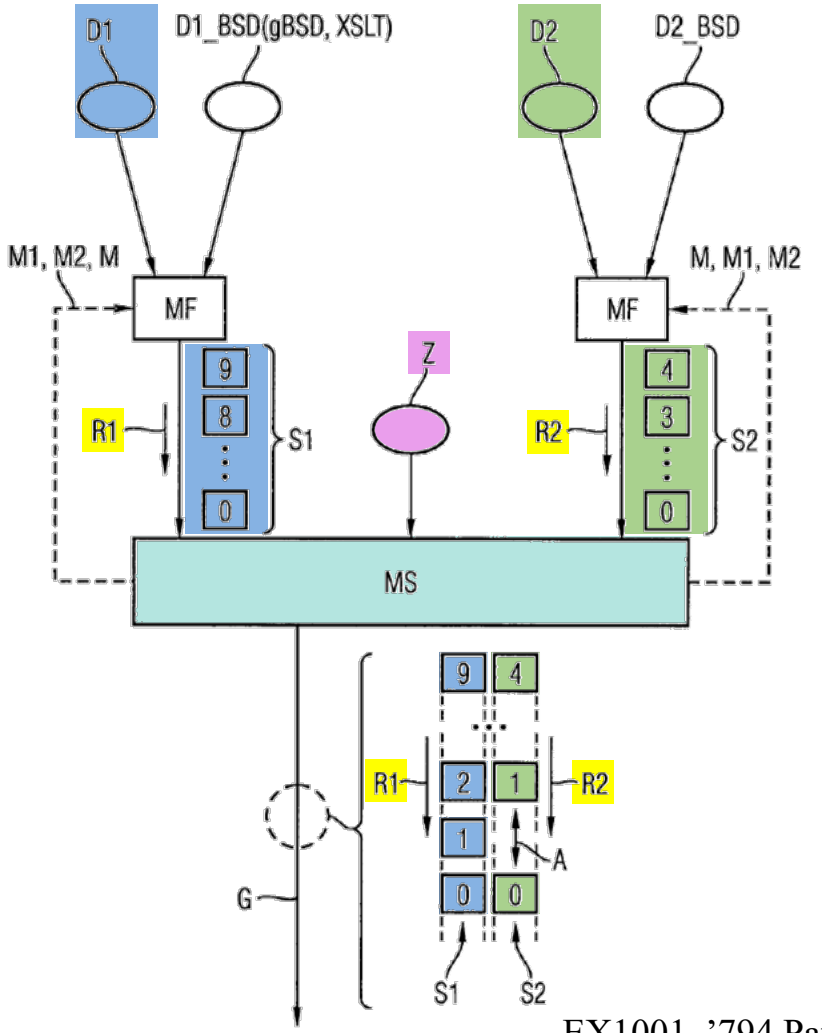
In this case the chronological sequence identifies that sequence of individual first data segments S1 in which, for example, the latter are played back visually or made audible. For example, one data segment contains the word "Good" and a further data segment the word "Morning", so the data segment containing "Good" is output first, and then the data segment containing "Morning". This chronological sequence R1 is represented symbolically in FIG. 1 by an arrow with the reference symbol R1. Additionally printed in the individual

EX1001, '794 Patent, 4:49-62; Paper 20, POR, at 16, 17

’794 Patent: Chronological Sequence

1. A method for synchronizing content-related first data segments of a first data file and content-related second data segments of a second data file, the method comprising:

sequentially outputting, by a device for synchronizing content-related data, the content-related first data segments according to their chronological sequence in such a way that each of the content-related second data segments is output together with an associated one of the content-related first data segments on the basis of an assignment rule for assigning each one of the content-related second data segments to one of the content-related first data segments.



EX1001, ’794 Patent, Fig. 1, Claim 1;
Paper 20, POR, at 6,7

Dr. Freedman Agrees That Syntactical Meaning Implicates Order

And my question is what is a "syntactical meaning"?

A In the context of video coding standards, the organization and arrangement of content, including audio and video segments and their encodings, is defined by a syntax which determines what is allowed and what isn't allowed, what order these elements of the syntax are allowed.

In some standards, they are referred to as NAL units. In other standards, they're simply referred to as elements. But the syntax of the standard is what -- is what determines what order they're allowed to be in and what element of the information they represent.

EX2008, Freedman Tr., at 32:13-33:6; Paper 26, POSR, at 5

Dr. Freedman Agrees That Syntactical Meaning Implicates Order

Abstraction Layer. It's a kind of theoretical layer of syntax that describes the order of syntax elements, such as segments in audio, video, and their allowed sequences, and it -- and it -- the elements are specified down to a very fine level of detail, such as I-frames, or P-frames, or various -- more detailed syntaxes.

So it's -- it's an abstraction of the layout and organization of the data.

Q So then turning back to the '794 patent, it says, "First and second data segments have a syntactical meaning within the respective data file."

Could you give an example of that?

A So one may have some -- at one level of abstraction one would have video segments, such as groups of pictures, and one may have segments of audio data or audio file. It principally could be more finely subdivided than that, but that's an example of information that has a defined syntax according to the various standards.

EX2008, Freedman Tr., at 34:1-11, 34:22-35:12; Paper 26, POSR, at 5

’794 Patent: Claim Construction

Preambles

All petitioned claims

Patent Owner’s Proposed Construction
The preambles are construed to be limiting. The first data file and the second data file are distinct from each other.

Paper 20, Patent Owner Response, at 21

The Preambles Recite Essential Structure

1. A method for synchronizing content-related first data segments of a first data file and content-related second data segments of a second data file, the method comprising:

sequentially outputting, by a device for synchronizing content-related data, the content-related first data segments and the content-related second data segments according to their chronological sequence in such a way that each of the content-related second data segments is output together with an associated one of the content-related first data segments on the basis of an assignment rule for assigning each one of the content-related second data segments to one of the content-related first data segments.

EX1001, '794 Patent, Claim 1; ; Paper 20, POR, at 7

The Preambles Recite Essential Structure

"content-related . . . data segments"

All petitioned claims

Patent Owner's Proposed Construction
Definitional Construction: data segments that have a syntactical meaning within the respective data file Preferred Construction: data segments ordered in a file such that they will present the file's contents in their intended presentation order when rendered sequentially

Paper 20, Patent Owner Response, at 14, 20-21

The Preambles Recite Essential Structure

5. The method as claimed in claim **1**, wherein media data are represented by at least one of the first data file and the second data file.

18. The method of claim **1**, wherein the assignment rule is maintained in a file separate from the first data file and the second data file.

EX1001, '794 Patent, Claims 5, 18; Paper 20, POR, at 24, 29, 30, 31

Data Files Are Essential to the Invention

For every first and second data file D1, D2 there exists in each case a fragmentation description file D1_BSD, B2_BSD. Said fragmentation description file D1_BSD, B2_BSD specifies how content-related first and content-related second data segments S1, S2 can be obtained from the respective first and second data file D12, D2. The term "content-related" is understood to mean that first and second data segments have a syntactical meaning within the respective data file, such as e.g. a plurality of succeeding second data segments represent the speech signal of a specific speaker within a dialog sequence. Furthermore, sections of the data file can also be understood thereby, such as e.g. individual images of a video sequence. In the following description data segments always refer to content-based data segments.

EX1001, '794 Patent, 4:9-22; Paper 20, POR, at 15

Shoes by Firebug LLC v. Stride Rite Children's Grp, LLC

'038 Patent, Claim 1 (Preamble Not Limiting)

1. An internally illuminated ***textile*** footwear comprises:
a footwear;
the footwear comprises a sole and an upper;
an illumination system;
the illumination system comprises a power source and a plurality of illumination sources;
a liner;
a structure;
the structure comprises an interfacing layer and a batting;
the structure being adjacently connected to the upper;
the structure being positioned between the liner and the upper;
the interfacing layer being positioned adjacent to the liner;
the batting being adjacently connected to the interfacing layer opposite the liner;
. . . .

'574 Patent, Claim 1 (Preamble Limiting)

1. An internally illuminated ***textile*** footwear comprises:
a sole and an upper;
an illumination system;
the illumination system comprises a power source and a plurality of illumination sources;
a liner;
an interfacing layer;
. . .
the liner being positioned interior to the upper;
the upper being a light diffusing section;
the illumination system being housed within ***the footwear***;
and the plurality of illumination sources emitting light, wherein the light enters the light diffusing section, then exits the upper as diffused light, creating a visual impression of internal radiant illumination across an outer surface of the upper

Shoes by Firebug LLC v. Stride Rite Children's Grp, LLC, 962 F.3d 1362, 1365-69 (Fed. Cir. 2020) (emphasis original)

3M Innovative Props. Co. v. Avery Dennison Corp

[7] The district court erred when it defined the term "multiple embossed patterns" to include a limitation that the patterns be created sequentially. The use of the terms "first" and "second" is a common patent-law convention to distinguish between repeated instances of an element or limitation. *See, e.g.*, *Anchor Wall Sys., Inc. v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298, 1304 (Fed.Cir.2003) (first and second sidewall surfaces); *Springs Window Fashions LP v. Novo Indus., L.P.*, 323 F.3d 989, 992 (Fed.Cir.2003) (first and second opposed ends). In the context of claim 1, the use of the terms "first ... pattern" and "second ... pattern" is equivalent to a reference to "pattern A" and "pattern B," and should not in and of itself impose a serial or temporal limitation onto claim 1.

3M Innovative Props. Co. v. Avery Dennison Corp., 350 F.3d 1365, 1371(Fed. Cir. 2003)

Having Separate Data Files Is Core to the Invention

For every first and second data file D1, D2 there exists in each case a fragmentation description file D1_BSD, B2_BSD. Said fragmentation description file D1_BSD, B2_BSD specifies how content-related first and content-related second data segments S1, S2 can be obtained from the respective first and second data file D12, D2. The term "content-related" is understood to mean that first and second data segments have a syntactical meaning within the respective data file, such as e.g. a plurality of succeeding second data segments represent the speech signal of a specific speaker within a dialog sequence. Furthermore, sections of the data file can also be understood thereby, such as e.g. individual images of a video sequence. In the following description data segments always refer to content-based data segments.

EX1001, '794 Patent, 4:9-22; Paper 20, POR, at 15

Claims Require Separate Data Files

1. A method for synchronizing content-related first data segments of a first data file and content-related second data segments of a second data file, the method comprising:

sequentially outputting, by a device for synchronizing content-related data, the content-related first data segments and the content-related second data segments according to their chronological sequence in such a way that each of the content-related second data segments is output together with an associated one of the content-related first data segments on the basis of an assignment rule for assigning each one of the content-related second data segments to one of the content-related first data segments.

EX1001, '794 Patent, Claim 1; Paper 20, POR, at 7

Dependent Claims Are Consistent With Separate Data Files

5. The method as claimed in claim **1**, wherein media data are represented by at least one of the first data file and the second data file.

12. The method as claimed in claim **5**, wherein the media data include at least one of video and audio data.

13. The method as claimed in claim **1**, wherein at least one of media data and metadata are represented by at least one of the first data file and the second data file.

EX1001, '794 Patent, Claims 5, 12, 13; Paper 20, POR at 30

’794 Patent: Claim Construction

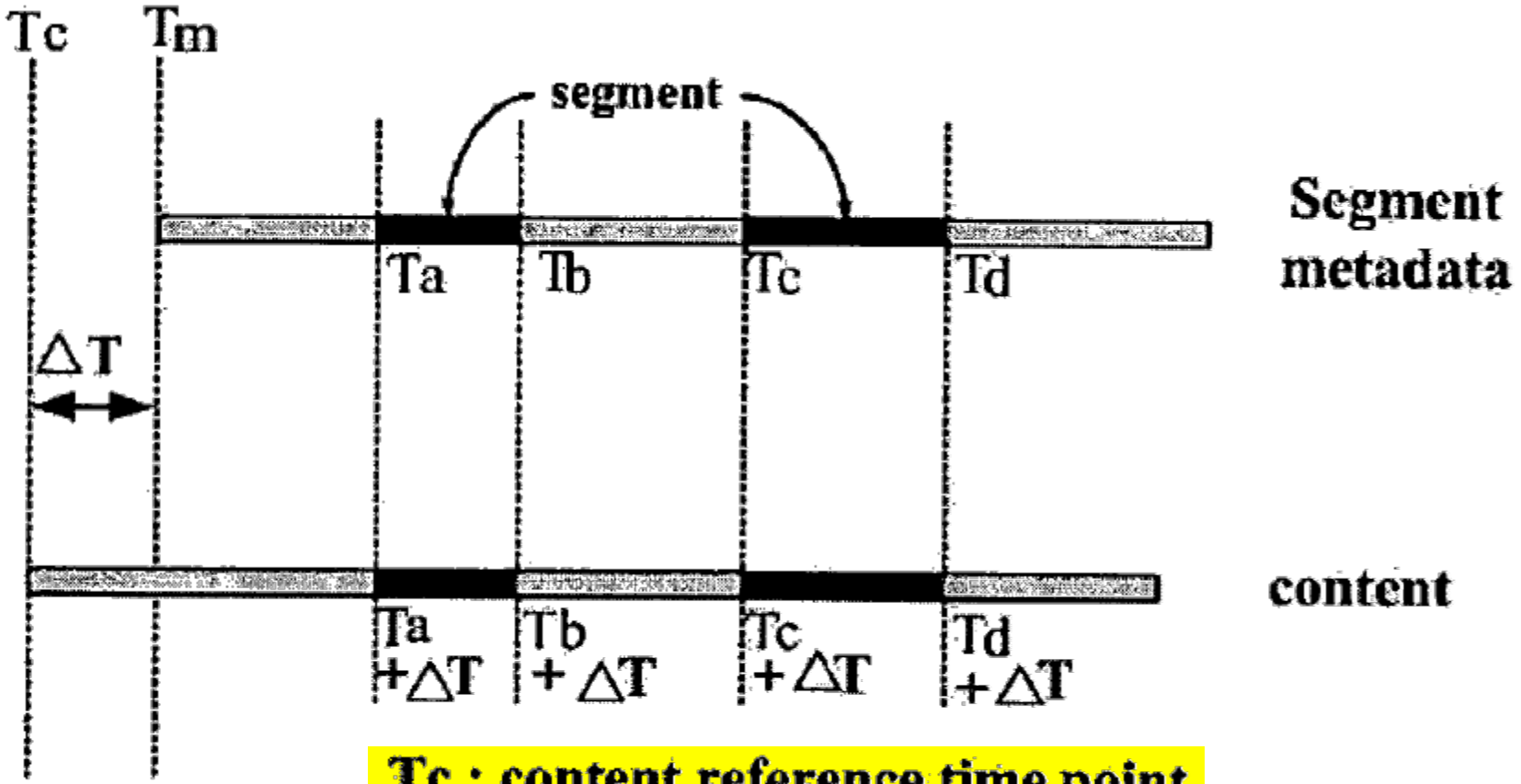
The “assignment rule” limitations

All petitioned claims

Patent Owner’s Proposed Construction
Assignment rule for assigning each one of the content-related second data segments to one of the content-related first data segments, wherein the assignment is not performed by using exact timing information for the content-related data segments

Paper 20, Patent Owner Response, at 32

Shin Uses Exact Timing Information



Tc : content reference time point

Tm : segment metadata reference time point

EX2011, Shin, Fig. 6B; Paper 20, POR, at 34

Use of Exact Timing Information Was Disclaimed

Shin discloses a method for synchronizing content segments with metadata in response to user requests. Shin, col. 2, lines 31-35. The content data and metadata each include time information for synchronization. Shin, col. 2, lines 33-36. In response to user content requests, a synchronizer determines reference time points from the time information contained within the content data and the metadata. Shin, col. 2, lines 35-40 and col. 8, lines 1-6. The synchronizer then determines a relative time point and synchronizes the content data and metadata based on the determined time point. Shin, col. 2, lines 42-45.

EX1002, '794 File History, at 259-60 (2012/04/11 Amendment, at 8-9); Paper 20, POR, at 34, 35

Use of Exact Timing Information Was Disclaimed

The Examiner equates the relative time point of Shin to "an assignment rule" of claim 1. However, this time point does not assign "each second data segment to a first data segment." On the contrary, Shin at best determines a point in time in content and metadata so that they are synchronized. Segments of one type of data are not assigned to segments of the other type; rather, a synchronization time is calculated. Further, there is no "assigning" of each "second data segment" to "a first data segment" disclosed elsewhere in Shin. For at least these reasons, Shin does not disclose, at least, "each second data segment is output together with an associated first data segment on the basis of an assignment rule for assigning each second data segment to a first data segment," as recited in amended claim 1.

EX1002, '794 File History, at 259-60 (2012/04/11 Amendment, at 8-9); Paper 20, POR, at 35

Use of Exact Timing Information Was Disclaimed

5. Applicant's arguments, see pages 8-10, filed on 04/11/2012, with respect to the rejection(s) of claim(s) 1-17 under 35 U.S.C 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Rosenau et all # 5598352 in view of Yamane # 5661523.

EX1002, '794 File History, at 273 (2012/06/29 Final Rejection, at 6); Paper 20, POR, at 35

Rosenau Uses Exact Timing Information

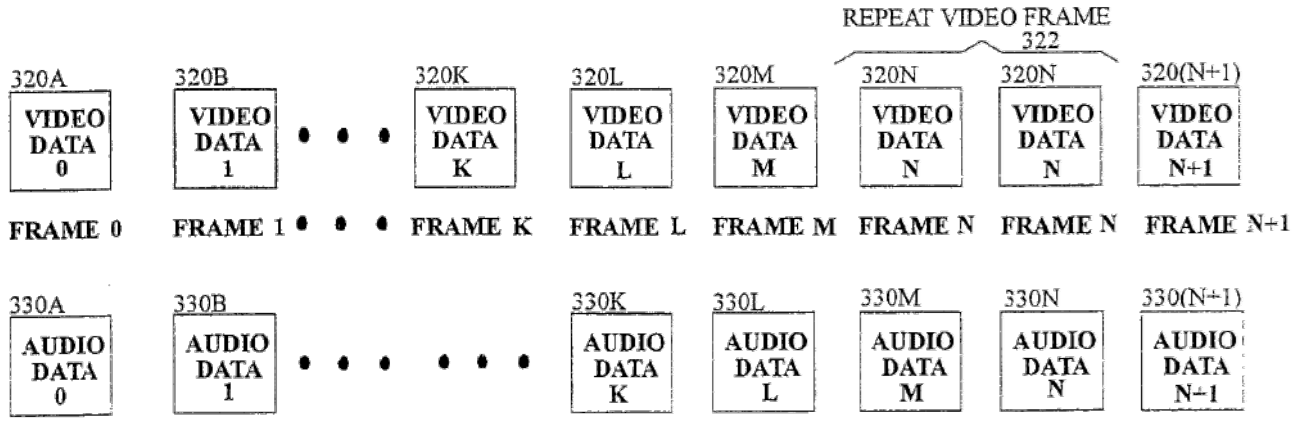


FIGURE 3B

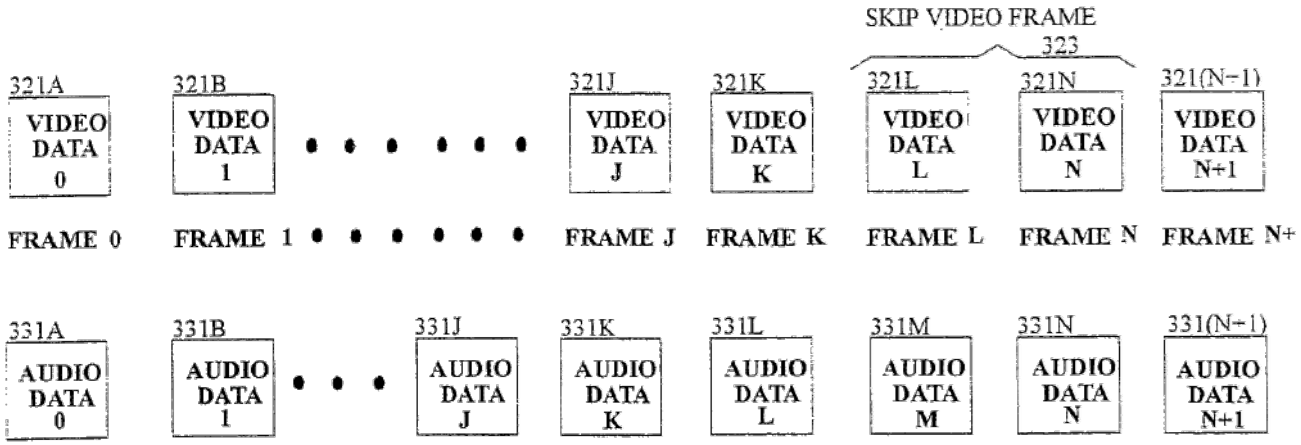


FIGURE 3C

EX2012, Rosenau, Figs. 3B, 3C; Paper 20, POR, at 37

Use of Exact Timing Information Was Disclaimed

Rosenau discloses a system that synchronizes a video display with audio playback. The synchronization is done by utilizing a system time clock. The synchronization is based on the timing information parsed from a data stream, which is loaded into a system time clock counter and incremented according to a pre-determined clock frequency. *Rosenau*, col. 3, l.57-col. 4, l. 7; col. 4, l. 3-7; col. 5, l. 8-10, 37-40, 65-66; col. 6, l. 24-25.

EX1002, '794 File History, at 334-36 (2012/11/29 Response After Final Rejection, at 13-15); Paper 20, POR, at 38

Use of Exact Timing Information Was Disclaimed

321N may be resynchronized with audio data(N) 331N. *The above discussion can be summarized as the frame synchronization is based on the timing information parsed from a data stream, which is loaded into a system time clock counter and incremented according to the clock frequency. And also the frame may be skipped in order to resynchronize the frame with audio data.* Therefore, synchronizing the frame and skipping the frame to resynchronize is not the equivalent to the "sequentially outputting data segments on the basis of an assignment rule for assigning one of the content-related second data segments for assigning each one of the content-related second data segment to one of the content-related first data segments".

EX1002, '794 File History, at 395-96 (2013/08/01 Notice of Allowance, at 4-5); Paper 20, POR, at 39

Claims 20 and 21 Further Differentiate From Claims 1 and 9

Patent Owner's Construction	Claims 20 and 21
" . . . wherein the assignment is not performed by using exact timing information for the content-related data segments	" . . . wherein the assignment rule is not based on a timestamp"

Paper 20, Patent Owner Response, at 32; EX1001, '794 Patent, Claims 20, 21; Paper 20, POR, at 39, 40

GPNE Corp. v. Apple Inc. (Fed. Cir. 2016)

[5] GPNE's claim differentiation argument does not alter this conclusion. Claim differentiation is "not a hard and fast rule," but rather a presumption that will be overcome when the specification or prosecution history dictates a contrary construction. *Seachange Int'l, Inc. v. C-COR, Inc.*, 413 F.3d 1361, 1369 (Fed. Cir. 2005). Because the specification and the prosecution history so consistently describe "nodes" as "pagers," such is the case here. In addition, the claims that GPNE contrasts differ in more ways than just their use of "node" or "pager," so the inference that "different words or phrases used in separate claims ... indicate that the claims have different meanings and scope," *id.* at 1368, is weak at best. Accordingly, we agree with the district court that "node" is properly characterized as a "pager."

GPNE Corp. v. Apple Inc., 830 F.3d 1365, 1371 (Fed. Cir. 2016); Paper 20, POR, at 40

Intrinsic Evidence Supports Patent Owner's Construction

ments. The synchronization is controlled by way of the predefinable assignment rule. In this way, content-related data segments can be output together according to their chronological sequence. This is of advantage, since the assignment is carried out without the use of timestamps. In this context the

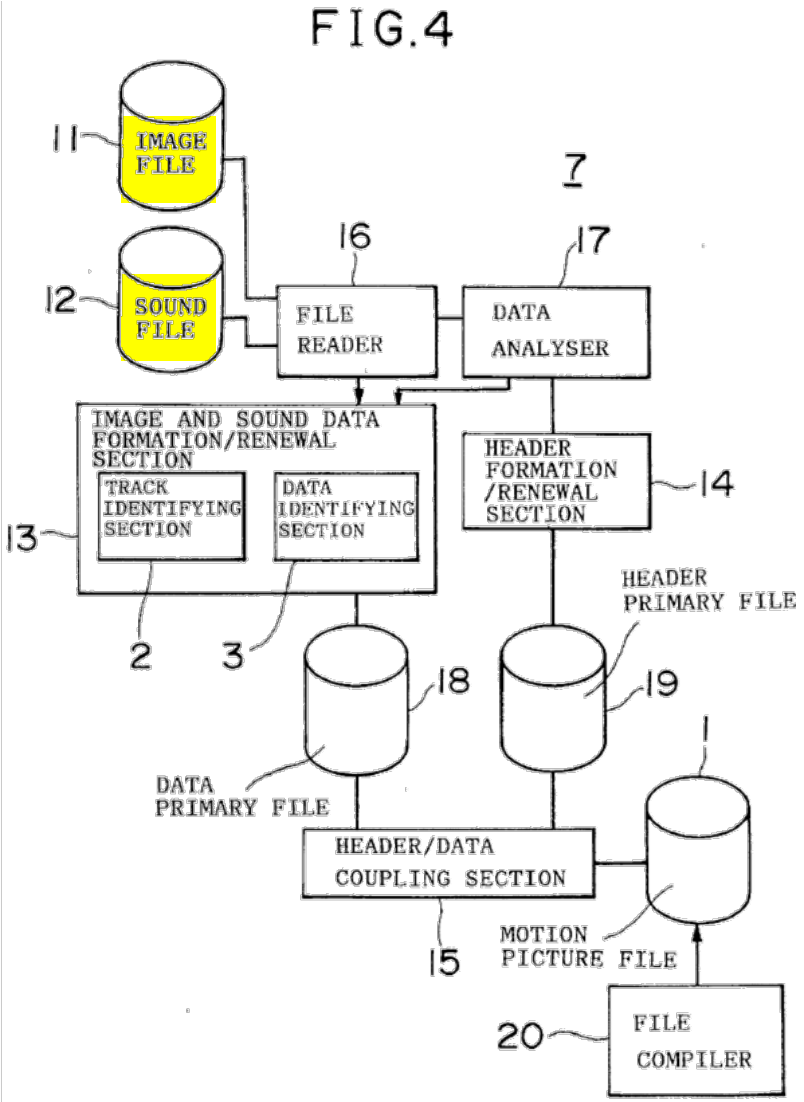
EX1001, '794 Patent, 2:39-43; Paper 20, POR at 40

Dr. Freedman Agrees Exact Timing Information Is Superfluous

- "Exact timing information . . . is superfluous to the claims and to the patent if the assignment rule is implemented."
- "So timestamps existed, but my reading of this patent appears to suggest that they are superfluous as such provided an assignment rule can match up the audio and the video, which of audio goes -- which data segments of the audio go with which data segments of the video."
- "I perceive timestamps as being superfluous to the main claims, the independent claims of this patent."

EX2014, Dr. Freedman Tr. at 30:20-37:3; Paper 26, POSR, at 12, 13

Sonohara: Combines Two Data Files Into a Single Data File



EX1003, Sonohara, Fig. 4; Paper 20, POS, at 51, 56

Sonohara: Combines Two Data Files Into a Single Data File

However, upon the reproduction of the data, the file control is intricate because the audio data and the image data are read out independently from the two files.

In view of the foregoing defects inherent in the prior art, an object of the present invention is to provide a motion picture reproducing apparatus in synchronism with the sound, which apparatus is capable of reproducing the video data and audio data contained in the file in synchronism.

Namely, since the image and sound data are reproduced in synchronism on a single file 1, the number of the file to be controlled may be one to simplify the file control and facilitate the program formation.

The number of the files to be controlled may be single to simplify the file control and to facilitate the program formation.

According to the present invention, when the image data and sound data are recorded in the file, the track identifying number and the data identifying number are imparted to the respective data, and the image and sound data recorded in a single file may be synchronously reproduced. Therefore, the number of the files to be controlled may be one to simplify the file control and in addition to facilitate the program formation.

EX1003, Sonohara, 1:36-38, 1:44-48, 3:21-24, 8:8-10, 8:23-26; Paper 20, POR, at 51, 52; Paper 26, POSR, at 22

Sonohara: Creation of Single Data File

FIG. **4** is a block diagram showing a structure of the file production processing device **7**. In FIG. **4**, the apparatus is provided with an image file **11** onto which image data of motion picture having a plurality of frames per unit time have been recorded for a predetermined period of time, and a sound file **12** onto which audio data have been recorded for a predetermined period of time corresponding to the image data. The image file **11** and the sound file **12** are formed on a magneto-optical disc.

EX1003, Sonohara, 4:12-20; Paper 26, POSR, at 21, 22

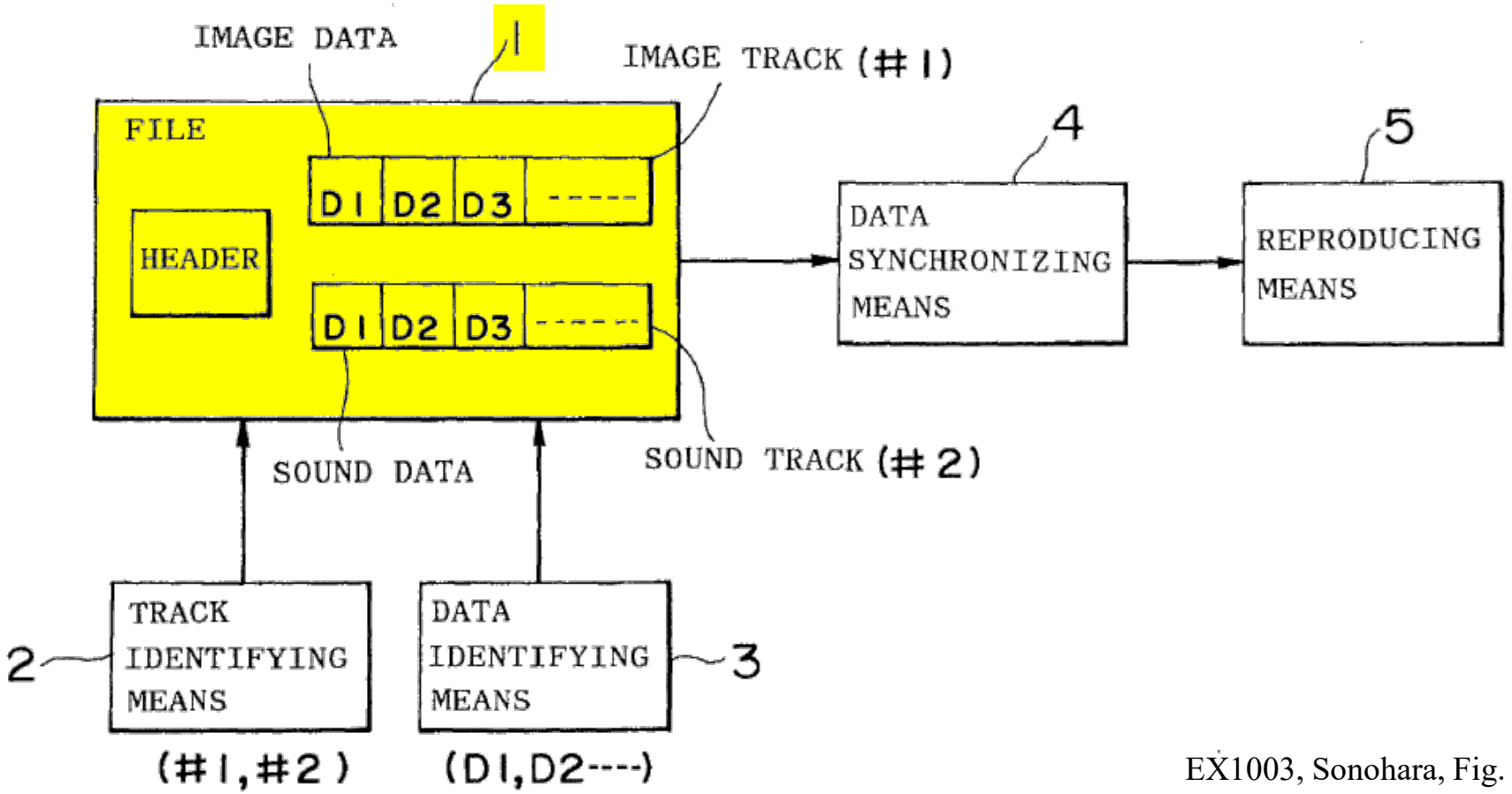
Sonohara: Combines Two Data Files Into a Single Data File

On the other hand, the image data of the file reading region **16** are read by the image/sound data formation/ renewal section **13** for a unit time (one second) to carry out the image data block formation process (step **104**). At this time, the track identifying section **2** imparts the track identifying number #1 to the image data for every unit time. The data identifying section **3** gives **01** in order of the data as the data identifying numbers. Then, the data primary file **18** is produced.

EX1003, Sonohara, 5:57-65; Paper 20, POR, at 58

Sonohara: Combines Two Data Files Into a Single Data File

FIG.1



EX1003, Sonohara, Fig. 1; Paper 20, PO, at 49

Sonohara: No Analysis of "Syntactical Meaning"

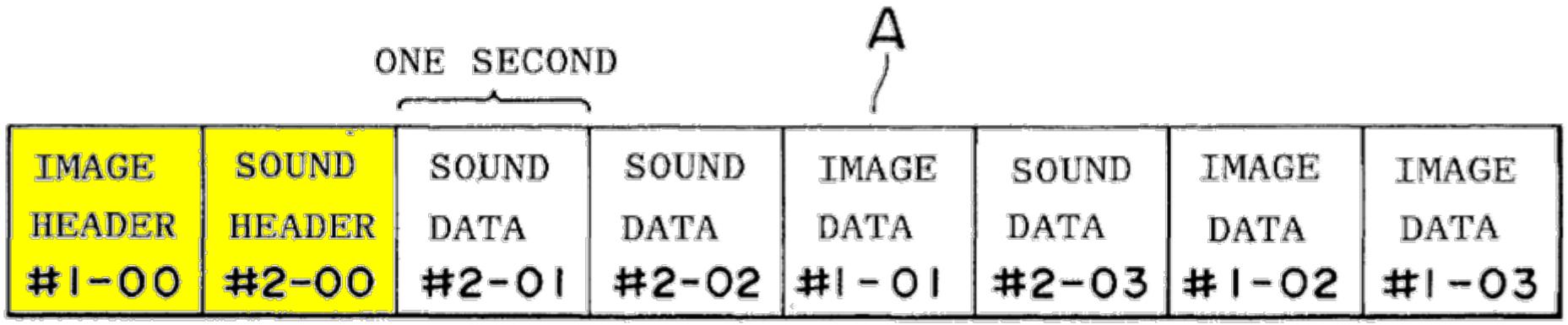
"content-related . . . data segments"

All petitioned claims

Patent Owner's Proposed Construction
Definitional Construction: data segments that have a syntactical meaning within the respective data file Preferred Construction: data segments ordered in a file such that they will present the file's contents in their intended presentation order when rendered sequentially

Paper 20, Patent Owner Response, at 14, 20-21

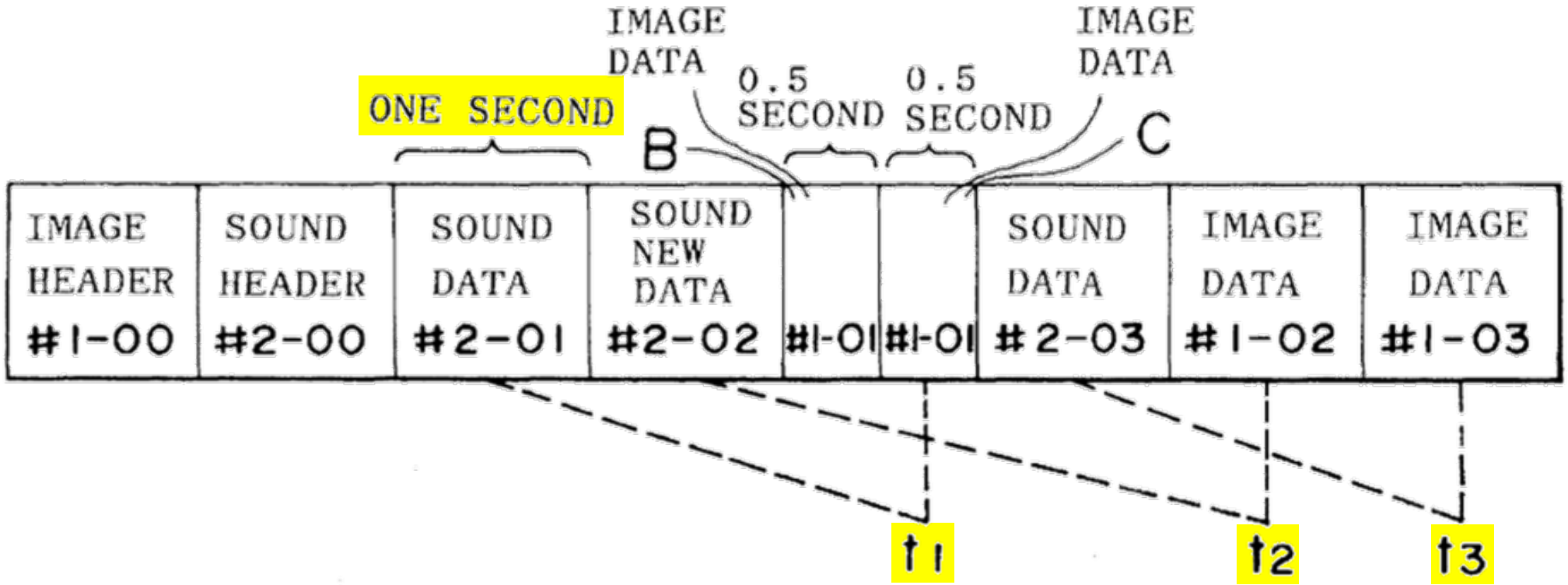
Sonohara: Alleged Syntax Is Only in the Single Data File



EX1003, Sonohara, Fig. 7; Paper 20, POR, at 50

Sonohara: Alignment Using Exact Timing Information

FIG.8



EX1003, Sonohara, Fig. 8; Paper 20, POR, at 59

Sonohara: Alignment Using Exact Timing Information

For example, in the example shown in FIG. **8**, at the time **t1**, the sound data **#2-01** for one second and the new image data **#1-01** for 0.5 seconds and the image data **#1-01** for 0.5 seconds are read in synchronism.

Further, in the example shown in FIG. **8**, at time **t2**, the sound data **#2-02** for one second and the image data **#1-02** for one second are read in synchronism.

sound data to the speaker **55** (step **208**). Further, at time **t3**, the sound data **#2-03** for one second and the image data **#1-03** for one second are read in synchronism.

EX1003, Sonohara, 7:33-36, 7:49-51, 7:57-59; Paper 20, POR, at 59

’794 Patent: Claims 20 and 21

20. The method of claim **1**, wherein the assignment rule is not based on a timestamp.

21. The device of claim **9**, wherein the assignment rule is not based on a timestamp.

EX1005, Freedman Decl., ¶167; Paper 20, POR, at 64

Claims 20 and 21 Further Differentiate From Claims 1 and 9

Patent Owner's Construction	Claims 20 and 21
" . . . wherein the assignment is not performed by using exact timing information for the content-related data segments	" . . . wherein the assignment rule is not based on a timestamp"

Paper 20, Patent Owner Response, at 32; EX1001, '794 Patent, Claims 20, 21

Sonohara: Alignment Based on Timestamps

167. In the context of the '794 Patent, a *timestamp* or "time code" (*see* '794 Patent (EX1001), 6:47) would be understood to be an absolute time or time range, e.g., 0:00.00–0:01.00. *Sonohara* does not use absolute times or time ranges, but instead uses the data identifying numbers, which are not limited to alignment with time units, and thus *Sonohara* discloses or at least renders obvious this limitation.

EX1005, Freedman Decl., ¶167; Paper 20, POR, at 64

Petitioner Fails to Make Legally Viable Obviousness Arguments

findings of fact. *Id.* An obviousness determination requires finding both ***1346** "that a skilled artisan would have been motivated to combine the teachings of the prior art ... and that the skilled artisan would have had a reasonable expectation of success in doing so."[1] *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016). Whether a person of ordinary skill in the art would have been motivated to modify or combine teachings in the prior art, and whether he would have had a reasonable expectation of success, are questions of fact. *Id.* at 1366.

The dissent suggests the PTO need not establish a reasonable expectation of success where there is a single prior art reference. *See* Dissent at 1349. We do not agree. Whether a rejection is based on combining disclosures from multiple references, combining multiple embodiments from a single reference, or selecting from large lists of elements in a single reference, there must be a motivation to make the combination and a reasonable expectation that such a combination would be successful, otherwise a skilled artisan would not arrive at the claimed combination.

In re Stepan Co., 868 F.3d 1342, 1345-46, n.1 (Fed. Cir. 2017); Paper 20, POR, at 46