

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LAWRENCE WILCOCK, ROGER CECIL FERRY TUCKER, and
ALISTAIR NEIL COLES

Appeal 2008-2901
Application 10/355,262
Technology Center 2100

Decided: December 22, 2008

Before HOWARD B. BLANKENSHIP, JEAN R. HOMERE, and
STEPHEN C. SIU, *Administrative Patent Judges*.

SIU, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is a decision on appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-25. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

The Invention

The disclosed invention relates generally to distinguishing real-world sounds from sounds produced by an audio user interface (Spec. 1). Specifically, one group of sounds may be distinguished between another group of sounds by cyclically varying the position of the sound sources to be distinguished (*id.* at 33).

Independent claim 1 is illustrative:

1. An audio user-interfacing method in which items are represented in an audio field by corresponding synthesized sound sources from where sounds related to the items appear to emanate; the method including while the user is able to hear real-world sounds from an environment in which the user is located, cyclically changing the position in said audio field of at least one of the synthesised sound sources whereby to assist the user in distinguishing the sounds emanating from the sound source from said real-world sounds.

The Reference

The Examiner relies upon the following reference as evidence in support of the rejections:

Courneau	US 5,987,142	Nov. 16, 1999
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The Rejection

The Examiner rejects claims 1-25 under 35 U.S.C. § 102(b) as being anticipated by Courneau.

ISSUE #1

Appellants assert that “there is nothing . . . indicating that the user of the Courneau . . . apparatus is able to hear real-world sounds” (App. Br. 15).

The Examiner finds that “Corneau [sic] teaches headphones that do not necessarily block a user ability to hear sounds not synthesized by the headphones” (Ans. 11).

Did Appellants demonstrate that the Examiner erred in finding that Courneau’s apparatus permits a user to hear real-world sounds?

FINDINGS OF FACT

The following Findings of Facts (FF) are shown by a preponderance of the evidence.

1. Courneau discloses altering or modifying “the position of the sound source . . . as a function of the motions of the pilot’s head” (col. 2, ll. 23-25), which is accomplished through “[t]he gathering of . . . head transfer functions [that] dictates a spatial sampling operation” (col. 4, ll. 1-2) such that “different instruments [determine] the orientation of the sound source . . . every 20 or 40 ms” (col. 4, ll. 23-26).
2. Courneau discloses that a pilot may utilize headphones to hear a co-pilot’s voice “as if it is actually coming from behind him” (col. 2, ll. 20-21).

3. Courneau discloses that the “sound spatializing device . . . can be used to increase the intelligibility of the sound sources that it processes” (col. 6, ll. 37-39).
4. Courneau discloses “on the basis of the data elements given by the detector of the position of the pilot’s head, the orientation of the aircraft with respect to the terrestrial reference system (given by the inertial unit of the aircraft) and the localization of the source, computes the spatial coordinates of the point from which the sound given by this source should seem to come from” (col. 3, ll. 17-23).
5. Courneau discloses that localization of sounds is based on “characteristics of the sources to be spatialized (elevation, relative bearing and distance from the pilot)” (col. 3, ll. 37-39).
6. Courneau discloses cyclically changing the position of synthesized sound sources, which may be based on “a function of the motions of the pilot’s head and the motions of the aircraft: for example, an alarm generated at the <<3 o’clock>> azimuth must be located at ‘noon’ if the pilot turns his head right by 90°” (col. 2, ll. 24-27).
7. Courneau discloses a “position of the loudspeaker, for each ear, after compensation for the responses of the miniature microphones and of the loudspeaker” (col. 5, ll. 34-36).

PRINCIPLES OF LAW

35 U.S.C. § 102

In rejecting claims under 35 U.S.C. § 102, “[a] single prior art reference that discloses, either expressly or inherently, each limitation of a claim invalidates that claim by anticipation.” *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1375 (Fed. Cir. 2005) (citation omitted).

“Anticipation of a patent claim requires a finding that the claim at issue ‘reads on’ a prior art reference.” *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1346 (Fed Cir. 1999) “In other words, if granting patent protection on the disputed claim would allow the patentee to exclude the public from practicing the prior art, then that claim is anticipated, regardless of whether it also covers subject matter not in the prior art.” (*Id.*) (Internal citations omitted).

It is axiomatic that anticipation of a claim under § 102 can be found only if the prior art reference discloses every element of the claim. See *In re King*, 801 F.2d 1324, 1326 (Fed. Cir. 1986) and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984).

ANALYSIS (ISSUE #1)

We agree with the Examiner that the headphones of Courneau “do not necessarily block a user ability to hear sounds not synthesized by the headphones” (Ans. 11). One of skill in the art would understand that

standard headphones, while providing sound through speakers, do not entirely block external sound. Because Courneau does not disclose that the headphones are specially designed to entirely block out environmental sounds (or “real world sounds”), or that blocking out such sounds is necessary, desirable, or otherwise likely to be implemented in the Courneau disclosure, we find no evidence that the headphones of Courneau have this specialized ability.

Appellants assert that “a user of the Courneau et al. system and the stereophonic headphones . . . is unable to hear . . . sounds passed to the user of the headphones, without going through spatialization module 1” (Reply Br. 4). Even assuming that sounds generated by the headphones of Courneau must pass through spatialization module 1 as Appellants assert, Appellants have not demonstrated that the sounds generated by the headphones are provided to the user to the complete exclusion of environmental or real world sounds, which are not passed through spatialization module 1.

Appellants assert that “[i]f the aircraft pilot were able to hear real world sounds, he would be able to hear the voice of his co-pilot who is sitting directly behind him” (Reply Br. 4). While Courneau discloses that a pilot may utilize headphones to hear a co-pilot’s voice “as if it is actually coming from behind him” (col. 2, ll. 20-21), Courneau does not disclose that the pilot is unable to hear the voice of the co-pilot. For example, the pilot may be able to hear the co-pilot’s voice directly from the co-pilot but may

also hear the co-pilot's voice with increased clarity via the headphones. Indeed, Courneau discloses that the "sound spatializing device . . . can be used to increase the intelligibility of the sound sources that it processes" (col. 6, ll. 37-39). In any event, Courneau does not disclose or even imply that the pilot is unable to hear real-world sounds. As such, we find that the weight of the evidence supports the Examiner's finding that the user of the Courneau system is able to hear real-world sounds.

Appellants assert that "it is very likely that stereophonic headphones of the type worn by the users of the Courneau et al. device detect environmental sounds and cancel these environmental sounds from the sounds coupled to the stereophonic headphones" because "headphones with voice canceling features worn by pilots and co-pilots of combat aircraft are obviously more sophisticated than those employed for commercial purposes" (Reply Br. 4-5). We find no evidence or disclosure in Courneau that the specifically disclosed headphones have noise canceling features, that a user in the Courneau system utilizing the headphones would be unable to hear environmental or real world sounds, that "more sophisticated" headphones would necessarily be able to completely block out environmental or real world sounds, or that pilots or co-pilots would necessarily employ only headphones that are able to block out environmental sounds entirely. Also, even assuming that noise-cancelling headphones are indeed able to entirely block out environmental sounds, which Appellant has not demonstrated or asserted, and even assuming that

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such headphones are “more sophisticated than those employed for commercial purposes” (Reply Br. 5), we find no evidence supporting Appellants contention that the headphones in Courneau are, in fact, such headphones.

For at least the aforementioned reasons, we conclude that Appellants have not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner’s rejection of claim 1-25 with respect to issue #1.

ISSUE #2

Appellants assert that Corneau fails to teach “cyclically changing the position in the audio field of at least one of the synthesized sound sources to assist a user in distinguishing sounds emanating from the synthesized sound source from real-world sounds” (App. Br. 16) because Courneau “has nothing to do with cyclically changing the position of the audio field of at least one synthesized sound source” (*id.*).

The Examiner finds that “the sound to be spatialized [in Courneau] would necessarily need to change in a cyclical fashion, every 20 to 40 ms, to accommodate the user moving his head” (Ans. 15) and that “because there is an approximation occurring every 20 to 40 ms, there is a difference between where and when the sound should come from every 20 to 40 ms. This difference is the offset that is cyclically varied” (*id.*).

Did Appellants demonstrate that the Examiner erred in finding that Courneau discloses cyclically changing the position in an audio field of a synthesized sound source to assist a user in distinguishing sounds?

ANALYSIS (ISSUE #2)

Claim 1 recites “cyclically changing the position . . . of the synthesised sound sources” (Claims Appendix). Construing the term “cyclically changing” broadly but reasonably, we find that “cyclically changing” includes altering or modifying a component or element “at an interval of time during which a sequence of a recurring succession of events or phenomena is completed” (“Cycle”: *Merriam-Webster’s Collegiate Dictionary* (11th ed. 2005)) or changing a component or element through a “course or series of events or operations that recur regularly” (*id.*). Courneau discloses altering or modifying “the position of the sound source . . . as a function of the motions of the pilot’s head” (col. 2, ll. 23-25), which is accomplished through “[t]he gathering of . . . head transfer functions [that] dictates a spatial sampling operation” (col. 4, ll. 1-2) such that “different instruments [determine] the orientation of the sound source . . . every 20 or 40 ms” (col. 4, ll. 23-26). Hence, Courneau discloses altering or modifying the position of a sound source periodically or “cyclically” (i.e., every 20 or 40 ms). Because Courneau discloses cyclically changing the positions of the sound sources, we agree with the Examiner that Courneau discloses the disputed feature recited in claim 1.

For at least the aforementioned reasons, we conclude that Appellants have not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner's rejection of claims 1-6, 18, 23, and 24 with respect to issue #2.

ISSUE #3

The Examiner finds that Courneau discloses a “sound source [that is] cyclically changed in position by cyclically varying an offset of the associated audio field reference (e.g., ‘by interpolation of the values thus measured’) (column 1, lines 39-48)” (Ans. 3).

Appellants assert that Courneau fails to teach “cyclically varying an offset of an associated audio field reference” (App. Br. 17) because “an interpolation operation has nothing to do with cyclically varying anything, no less on offset of an audio field reference” (*id.*).

Did Appellants demonstrate that the Examiner erred in finding that Courneau discloses cyclically varying an offset of an associated audio field reference?

ANALYSIS (ISSUE #3)

As set forth above, we find that Courneau discloses cyclically changing the position of synthesized sound sources. Courneau also discloses “on the basis of the data elements given by the detector of the position of the pilot's head, the orientation of the aircraft with respect to the terrestrial

reference system (given by the inertial unit of the aircraft) and the localization of the source, computes the spatial coordinates of the point from which the sound given by this source should seem to come from” (col. 3, ll. 17-23) and that localization of sounds is based on “characteristics of the sources to be spatialized (elevation, relative bearing and distance from the pilot)” (col. 3, ll. 37-39). Hence, Courneau discloses a system that determines a location point of a synthesized sound source based on, among other things, comparing the orientation of an aircraft to a reference point (i.e., with respect to the terrestrial reference system) or relative bearing of the source from a reference point (e.g., distance from the pilot). We agree with the Examiner that by computing a distance or offset between a reference point and a present location of a sound source, Courneau discloses varying an offset of an audio field reference as recited in claim 3.¹

Appellants argue that “an interpolation operation has nothing to do with cyclically varying anything, no less on offset of an audio field reference” (App. Br. 17). Even assuming that Appellants’ contention to be correct, Appellants have not demonstrated that Courneau does not also disclose cyclically varying an offset of an audio field reference. Indeed, the Examiner has demonstrated that Courneau does in fact disclose the disputed feature.

¹ We note that while claim 3 recites “the associated audio field reference,” claim 1, from which claim 3 depends, does not provide antecedent support for this feature. We therefore assume that claim 3 depends from claim 2.

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For at least the aforementioned reasons, we conclude that Appellants have not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner's rejection of claims 3, 15-17, and 22 with respect to issue #3.

ISSUE #4

The Examiner finds that Courneau discloses “the at least one sound source cyclically changed in position by cyclically varying the position thereof relative to the associated audio field reference (e.g., ‘signal to be spatialized is actually convoluted’) (column 4, lines 23-33)” (Ans. 4).

Appellants assert that “the words ‘signal to be spatialized is actually convoluted’ do not mean the sound source is cyclically varied to assist a user in distinguishing sounds emanating from a synthesized sound source from real-world sounds” (App. Br. 19).

Did Appellants demonstrate that the Examiner erred in determining that Courneau discloses a sound source cyclically changing in position by cyclically varying the position thereof relative to an associated audio field reference?

ANALYSIS (ISSUE #4)

As set forth above, we find that Courneau discloses cyclically changing the position of synthesized sound sources and that the position of sound sources is compared to a reference position (e.g., with respect to the terrestrial reference system (given by the inertial unit of the aircraft) or

based on relative bearing and distance from the pilot)). In addition, by modifying or altering the position of the location of the sound source, Courneau also discloses distinguishing the sound (or sound source) from other sounds (including real world sounds) since assigning a location position to a sound provides the sound (or sound source) with a distinctive feature that is different from other sounds that may not have an assigned location or may have a different assigned location.

Appellants argue that convolution of a signal “[does] not mean the sound source is cyclically varied” (App. Br. 19). Even assuming Appellants contention to be true, Appellants have still not demonstrated that assigning a unique location position to a sound that differentiates that sound from other sounds is not equivalent to varying a position cyclically.

For at least the aforementioned reasons, we conclude that Appellants have not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner’s rejection of claims 4, 15-17, and 22 with respect to issue #4.

ISSUE #5

The Examiner finds that “[b]ecause a user’s head is able to move in a back and forth and in a circular fashion, the sound to be spatialized would necessarily need to change in a cyclical fashion, every 20 to 40 ms, to accommodate the user moving his head without any audible ‘jumps’ during restitution” (Ans. 12).

Appellants assert that “[t]here is nothing to indicate the pilot or other user of the stereophonic headset would move his head back and forth to provide linear oscillation of the apparent position of a sound source and/or in a circular manner to circularly change the apparent position of a sound source in a cyclic manner” (Reply Br. 6).

Did Appellants demonstrate that the Examiner erred in determining that Courneau discloses a cyclic change taking the form of circular movements?

ANALYSIS (ISSUE #5)

Since Appellants’ arguments have treated claims 5 and 6 as a single group, we select claim 6 as the representative claim for this group. *See* 37 C.F.R. § 41.37(c)(1)(vii).

Claim 6 recites that the “cyclic change in position . . . takes the form of circular movements” (Claims Appendix). As set forth above, we find that Courneau discloses cyclically changing the position of synthesized sound sources, which may be based on “a function of the motions of the pilot’s head and the motions of the aircraft: for example, an alarm generated at the <<3 o’clock>> azimuth must be located at ‘noon’ if the pilot turns his head right by 90°” (col. 2, ll. 24-27). Hence, Courneau discloses the pilot turning his head by 90°, which includes a circular movement of the head, and a corresponding re-positioning of the sound source. Therefore, we agree with the Examiner that Courneau discloses changing a position in circular movements.

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Appellants argue that the “Examiner has not explained how the term ‘convoluted’ can have such disparate meanings” (App. Br. 19). However, we find that the definition of the term “convoluted” is irrelevant to the issue of whether Courneau discloses a circular movement of a pilot’s head.

For at least the aforementioned reasons, we conclude that Appellants have not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner’s rejection of claim 6, and of claim 5 which falls therewith, with respect to issue #5.

ISSUE #6

Appellants assert that Courneau fails to disclose “moving a distinctive presentation effect only at intervals, as required by claim 7” (App. Br. 21).

The Examiner finds that Courneau discloses “that a spatial position and time is computed, so that a sound seems as if coming from a particular place at a particular time” (Ans. 17).

Did Appellants demonstrate that the Examiner erred in finding that Courneau discloses a distinctive presentation effect being movement of an audio field reference to impart underlying stabilization only at intervals?

ANALYSIS (ISSUE #6)

As set forth above, Courneau discloses spatialization of sound sources in an audio field (i.e., providing a distinctive presentation effect corresponding to the sound source) and modifying the position at designated

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time intervals (i.e., recalculating “the orientation and location of the user’s head . . . every 20 or 40 ms – col. 4, ll. 24-26). Therefore, we disagree with Appellants’ contention for reasons set forth above.

For at least the aforementioned reasons, we conclude that Appellants have not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner’s rejection of claims 7, 8, 9, 15-17, 19, and 22 with respect to issue #6.

ISSUE #7

Appellants assert that “sensor 33 (Figure 1) [of the present invention] measure the turning angle of the head and rotates the audio field reference 42 by the same amount as the head rotation, but in the opposite direction to stabilize the apparent positions of sound sources 40 relative to the body of the user (page 10, lines 17-19)” (App. Br. 22) but that “[t]here is nothing in Courneau et al. to indicate such stabilization or action occurs” (*id.*).

The Examiner finds that Courneau discloses “underlying stabilisation to the audio-field reference as the user moves (column 2, lines 23-27)” (Ans. 4).

Did Appellants demonstrate that the Examiner erred in finding that Courneau discloses imparting an underlying stabilization to the audio-field reference as the user moves?

ANALYSIS (ISSUE #7)

As set forth above, Courneau discloses that the “position of the sound source changes as a function of the motions of the pilot’s head and the motions of the aircraft” (col. 2, ll. 23-25). By altering the position of the sound source to offset the movement of the pilot’s head, the Courneau system stabilizes the positions of the sound sources relative to movement of the user (or aircraft).

Appellants argue that the instant invention is drawn to rotating “the audio field reference 42 by the same amount as the head rotation, but in the opposite direction to stabilize the apparent positions of sound sources 40 relative to the body of the user (page 10, lines 17-19)” (App. Br. 22) but asserts that this process is different from that disclosed by Courneau. We find no distinction between the stabilization of the sound source as described by Appellant and the stabilization of the sound source in Courneau because both systems change the position (or stabilize the position) of a sound source based on movement of a user’s head.

For at least the aforementioned reasons, we conclude that Appellants have not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner’s rejection of claims 7, 8, 9, 15-17, 19, and 22 with respect to issue #7.

ISSUE #8

Appellants assert that “the reference to ‘finite number of points’ [of Courneau] has nothing to do with only periodically updating underlying stabilization” but only “relates to the measurements that are taken in connection with the anechoic chamber discussed in connection with Figure 4” (App. Br. 23). Hence, Appellants argue that Courneau fails to disclose the sound source is only periodically updated as recited in claim 10.

The Examiner finds that Courneau discloses a system that “periodically updates underlying stabilization” (Ans. 20).

Did Appellants demonstrate that the Examiner erred in finding that Courneau discloses an underlying stabilization to which a sound source is only periodically updated?

ANALYSIS (ISSUE #8)

As set forth above, Courneau discloses that the “position of the sound source changes as a function of the motions of the pilot’s head and the motions of the aircraft” (col. 2, ll. 23-25) and that re-positioning of the sound sources is determined via calculations performed “every 20 or 40 ms” (col. 4, l. 26). Hence, Courneau discloses spatialization (i.e., a “distinctive presentation”) of a sound source that is performed every 20 or 40 ms. We find that performing an action at a predetermined time interval, such as every 20 or 40 ms, includes periodically performing the action.

For at least the aforementioned reasons, we conclude that Appellants have not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner's rejection of claims 10, 15-17, 20, 22, and 25 with respect to issue #8.

ISSUE #9

Appellants argue that “the only audiophonic equipment disclosed by the reference is a set of headphones” but that “[t]here is no mention of loudspeakers [in Courneau], and loudspeakers would be inappropriate for aircraft audiophonic system to which the disclosure of Courneau et al is directed” (App. Br. 28).

Did Appellants demonstrate that the Examiner erred in finding that Courneau discloses that the output devices are loudspeakers?

ANALYSIS (ISSUE #9)

Courneau discloses headphones that include loudspeakers. For example, Courneau discloses a “position of the loudspeaker, for each ear, after compensation for the responses of the miniature microphones and of the loudspeaker” (col. 5, ll. 34-36). Because Courneau discloses loudspeakers, we disagree with Appellants' contention that Courneau fails to disclose loudspeakers.

For at least the aforementioned reasons, we conclude that Appellants have not sustained the requisite burden on appeal in providing arguments or

evidence persuasive of error in the Examiner's rejection of claims 21 and 22 with respect to issue #9.

CONCLUSION OF LAW

Based on the findings of facts and analysis above, we conclude that Appellants have failed to demonstrate that the Examiner erred in:

1. finding that Courneau's apparatus permits a user to hear real-world sounds (issue #1);
2. finding that Courneau discloses cyclically changing the position in an audio field of a synthesized sound source to assist a user in distinguishing sounds (issue #2);
3. finding that Courneau discloses cyclically varying an offset of an associated audio field reference (issue #3);
4. determining that Courneau discloses a sound source cyclically changing in position by cyclically varying the position thereof relative to an associated audio field reference (issue #4);
5. determining that Courneau discloses a cyclic change taking the form of circular movements (issue #5);
6. finding that Courneau discloses a distinctive presentation effect being movement of an audio field reference to impart underlying stabilization only at intervals (issue #6);
7. finding that Courneau discloses imparting an underlying stabilization to the audio-field reference as the user moves (issue #7);

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8. finding that Courneau discloses an underlying stabilization to which a sound source is only periodically updated (issue #18); and
9. finding that Courneau discloses that the output devices are loudspeakers (issue #9).

DECISION

We affirm the Examiner's decision rejecting claims 1-25 under 35 U.S.C. § 102(b).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

msc

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