UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WERNER KRIECHBAUM and GERHARD STENZEL

Appeal 2009-001354
Application 10/272,638
Technology Center 2100

Decided: September 21, 2009

Before JAMES D. THOMAS, LEE E. BARRETT, and JOHN A. JEFFERY,
Administrative Patent Judges.

JEFFERY, Administrative Patent Judge.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner’s
rejection of claims 1 and 3-19. We have jurisdiction under 35 U.S.C. § 6(b).
We affirm.
STATEMENT OF THE CASE

Appellants invented a method, product and server computer for creating a music data index. Data that represents a property of a musical piece is extracted from a digital score of a musical piece, and the database is created from that property. Properties include tonality or pitch information.¹ Independent claim 1 is reproduced below with the key disputed limitations emphasized:

1. A computer-implemented method for creating a database index for a piece of music, comprising:

   extracting at least one property of the piece of music from a digital score of the piece of music; and [sic]

   creating the database index for the piece of music using the at least one property; and

   assigning a numerical value to each pitch value of each of a plurality of voice, in the digital score of the piece of music such that a linear scale for plural pitch intervals results.

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

Smith US 6,018,118 Jan. 25, 2000

Erling Wold et al., Content-Based Classification, Search, and Retrieval of Audio, 3 IEEE Multimedia 27, 27-35 (1996).


¹ See generally Spec. 5, 6, and 8; Fig. 1.
2. Claims 8-11, 17, and 19 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Wold. Ans. 4-6.

3. Claims 1 and 3-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wold and Smith. Ans. 6-9.

Rather than repeat the arguments of Appellants or the Examiner, we refer to the Briefs and the Answer for their respective details. In this decision, we have considered only those arguments actually made by Appellants. Arguments, which Appellants could have made but did not make in the Briefs, have not been considered and are deemed to be waived. See 37 C.F.R. § 41.37(c)(1)(vii).

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2 The Examiner cites paragraph (a) of section 102 to reject the claims. The Wold reference, however, was published in 1996 and was therefore published more than one year prior to the date of the present application, October 16, 2002. Thus, Wold actually qualifies as prior art under § 102(b).

3 Despite the conflicting information in the Answer (Ans. 14), we find that, based on the totality of the record, the rejection of claims 5, 9, 11, 15, and 17 under 35 U.S.C. § 112, second paragraph has been withdrawn. The Examiner has not presented a § 112 rejection under the Grounds of Rejection section of the Examiner's Answer (see Ans. 3-9) and has stated “the rejection has been withdrawn” for claims 5, 9, 11, 15, and 17 (Ans. 14).

4 Throughout the opinion, we refer to: (1) the Appeal Brief filed November 5, 2007; (2) the Examiner’s Answer mailed January 24, 2008; and (3) the Reply Brief filed January 28, 2008.
I. NON-STATUTORY SUBJECT MATTER REJECTION

The Examiner finds that representative independent claim 11\(^5\) recites a database or software that does not fall into one of the four statutory categories of invention under 35 U.S.C. § 101. Ans. 3. Appellants argue that the Examiner discusses claim 30, not claim 11, and also fails to point out how the structure in the Specification corresponding to the recited means-plus-function limitations is non-statutory. App. Br. 7-8; Reply Br. 2-3.

ISSUE

The following issue has been raised in the present appeal:

(1) Have Appellants shown that the Examiner erred in rejecting claims 11-16 as being directed to non-statutory subject matter?

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence.

Appellants’ Disclosure

1. The Specification does not define the term “computer readable program product.” See generally Spec.

2. Appellants discuss techniques for extracting musical properties from a score, such as identifying data or performing a statistical analysis. Spec. 5:12-20.

3. Appellants discuss how to create the database index based on the musical properties, including using the results of the statistical analysis to choose values for the index. Spec. 8:5-11.

PRINCIPLES OF LAW

Under § 101, there are four categories of subject matter that are eligible for patent protection: (1) processes; (2) machines; (3) manufactures; and (4) compositions of matter. 35 U.S.C. § 101. While the scope of patentable subject matter encompassed by § 101 is “extremely broad” and intended to “include anything under the sun that is made by man,” it is by no means unlimited. In re Comiskey, 554 F.3d 967, 977 (Fed. Cir. 2009) (quoting Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980)). Laws of nature, abstract ideas, and natural phenomena are excluded from patent protection. Diamond v. Diehr, 450 U.S. 175, 188 (1981).

ANALYSIS

We find no error in the Examiner’s rejection of representative claim 11 as being directed to non-statutory subject matter. As a preliminary matter, we acknowledge that the Examiner made a typographical error by citing to claim 30 in the May 31, 2007 Non-Final Rejection. See Non-Final Rej. 4. Nonetheless, the heading states that claims 11 through 16 are rejected under § 101. Moreover, claim 30 does not exist, and the discussion is directed to “a computer readable program product” recited in claim 11—the only independent claim in the Examiner’s rejection. Thus, based on the totality of the record, the Examiner clearly intends to refer to claim 11.
A computer readable program product is not a process or composition of matter set forth in 35 U.S.C. § 101. But a computer readable program product may be a machine or manufacture under that statute. Because the Specification does not define the term “computer readable program product” (FF 1), we interpret the term with its broadest reasonable interpretation. See In re Am. Acad. Of Sci. Tech Ctr., 367 F.3d 1359, 1364 (Fed. Cir. 2004).

Appellants’ “means for” limitations include algorithms, routines, or logic to perform the functions recited. See FF 2-3. Appellants have matched the “means for” limitations to the Specification. See App. Br. 3. The “means for extracting” limitation maps to a step of identifying data or a discussion of statistical analysis or an algorithm. See FF 2. This involves no more than logic or an algorithm to perform the recited function of extracting a music property from a digital score. The “means for creating” limitation maps to using the statistical analysis to arrive at the index. See FF 3. Thus, the “means for creating” limitation likewise involves no more than logic or an algorithm to perform the recited function of creating a database index for the music piece using the extracting property. It is not clear that the "product" is a tangible structure like a memory, as opposed to the software per se. Nor is it clear that the recited "means" corresponds to "structure" that falls within a statutory class of a "machine" or "manufacture," as opposed to software per se for performing the functions. Thus, considering claim 11 in its entirety, the claim recites no more than software, logic, or a data structure (i.e., an abstraction) that does not fall within a statutory category. Claims directed to data structures per se are nonstatutory. In re Warmerdam, 33 F.3d 1354, 1361 (Fed. Cir. 1994).
Moreover, as USPTO guidelines\(^6\) explain:

A claim that includes terms that imply the invention is directed to a product . . . but fails to include tangible limitations in accordance with its broadest reasonable interpretation is not limited to a practical application, but rather wholly embraces or encompasses the concept upon which the invention is based. This is impermissible as such claim coverage would extend to every way of applying the abstract idea, law of nature or natural phenomenon.

Because claim 11 recites only a data structure, the claim fails to include tangible limitations. Thus, the claim’s coverage extends to every way of applying the abstract idea and is therefore patent ineligible.

Claim 11, therefore, is directed to nonstatutory subject matter under 35 U.S.C. § 101, along with dependent claims 12-16, which fall with claim 11.

II. ANTICIPATION REJECTION

The Examiner finds that Wold discloses all the limitations of representative claim 8,\(^7\) including having a database storing non-acoustic digital music scores. Ans. 4. Appellants argue that Wold analyzes acoustic sounds and not digital music scores as claim 8 requires. App. Br. 4-6; Reply Br. 1-2. Appellants also contend that independent claims 11 and 17 require a digital score. App. Br. 6.


\(^7\) Appellants group claims 8-11, 17, and 19. App. Br. 4-6. Accordingly, we select independent claim 8 as representative. 37 C.F.R. § 41.37(c)(1)(vii).
ADDITIONAL ISSUES

The additional following issues have been raised in the present appeal:

(2) Have Appellants shown that the Examiner erred in rejecting claim 8 by finding that Wold discloses a database capable of storing non-acoustic digital music scores?

(3) Have Appellants shown that the Examiner erred in rejecting claims 11 and 17 by finding that Wold discloses a musical piece from a digital score?

ADDITIONAL FINDINGS OF FACT

The record supports the following additional findings of fact (FF) by a preponderance of the evidence.

Wold

4. Wold discloses an audio application used with computers that stores audio objects in a database. The audio objects include sound effects, soundtrack portions of a news footage archive, laughter, and male/female speech. Wold, at 27, 31, and 32.

5. Wold discloses content-based classification, search and retrieval features can be applied to audio databases. The features include analyzing, classifying, retrieving, and segmenting sounds. Wold, at 27-33.

6. Wold discloses converting audio recording into musical score information (i.e., MIDI data) and analyzing the sound segments in the same manner as the other disclosed audio objects. Wold, at 35.
Appellants’ Disclosure

7. The Specification does not define “score.”

8. Appellants state that musical scores “are available in digital format such as in MIDI files.” Spec. 3:19-21.

Definitions

9. Appellants provide a definition of “score” (“a copy of musical composition showing all parts for the instruments or voices”) from The New World Dictionary, Third College Edition. App. Br. 6.

10. “Score” is defined, in pertinent part, as “[t]he written form of a musical composition for orchestral or vocal parts, either complete or for a particular instrument or voice. . . . The music composed for a dramatic presentation.” Webster’s II New Riverside Univ. Dictionary 1047 (1994).

PRINCIPLES OF LAW

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” Verdegaal Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631 (Fed. Cir. 1987).

In general, a preamble limits the invention if it recites essential structure or step, or if it is “necessary to give life, meaning, and vitality” to the claim. . . . Conversely, a preamble is not limiting “where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.”

During examination of a patent application, a claim is given its broadest reasonable construction “in light of the specification as it would be interpreted by one of ordinary skill in the art.” *Am. Acad.*, 367 F.3d at 1364 (internal citations and quotations omitted). “[T]he words of a claim ‘are generally given their ordinary and customary meaning.’” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (internal citations omitted).

**ANALYSIS**

We find no error in the Examiner’s anticipation rejection. Claim 8 recites, “[a] method for retrieval of a piece of music from a database . . . the database storing non-acoustic digital music scores.” Only the preamble of claim 8 recites a “digital score.” Thus, the claim body defines a structurally complete invention, and the limitation to the “digital score” in the preamble only states the intended use of the invention. *See Catalina*, 289 F.3d at 808.

Wold discloses using its content-based features on a computer database that stores sound effects and soundtrack portions of news footage. FF 4-5. While Appellants provide us with one definition of “score” (FF 9), we are not limited by this definition given the term’s broadest reasonable interpretation. *See Am. Acad.*, 367 F.3d at 1364. Notably, the Specification does not limit the term “score” to this definition (FF 7), and the ordinary and customary meaning of a score includes the music composed for a dramatic presentation. FF 10. A soundtrack for news footage as in Wold (FF 4) is music composed for a dramatic presentation. Thus, Wold also discloses a database that is capable of storing a digital music score.
Additionally, Wold discloses converting audio recording into musical score information and analyzing the MIDI data sound segments in the same manner as the other disclosed audio objects. FF 6. As this MIDI music score is in the same format as one of the possible non-acoustic formats used for indexing disclosed by Appellants (FF 8), Wold discloses a database that has the ability to—and actually does—store non-acoustical digital music scores. Thus, we disagree with Appellants that Wold does not contemplate a digital score (App. Br. 5) as recited in claim 8.

Unlike claim 8, independent claims 11 and 17 recite a “piece of music from a digital score” in the body of the claim and do not require the score be “non-acoustical.” However, because Wold explicitly discloses analyzing music scores (FF 6) as explained above, we are not persuaded by Appellants’ arguments that Wold does not use digital music score. App. Br. 4-6.

For the foregoing reasons, Appellants have not shown the Examiner erred in rejecting independent claims 8, 11, and 17 and dependent claims 9, 10, and 19.

III. OBVIOUSNESS REJECTION

We also find no error in the Examiner’s obviousness rejection. The Examiner finds that Wold discloses and teaches all the limitations of representative claim 1,\(^8\) except for the step of assigning a numerical value to each pitch value for a plurality of voices in a digital music score such that a

\(^8\) Appellants separately discuss independent claim 1 from claims 8, 11, and 17. App. Br. 6-7. However, Appellants repeat the arguments of claim 1 and, thus, group claims 1 and 3-19. Accordingly, we select independent claim 1 as representative. 37 C.F.R. § 41.37(c)(1)(vii).
linear scale for plural pitch intervals results. Ans. 6. The Examiner relies on Smith’s discussion of assigning numerical values to pitch values of a voice to modify Wold and teach the missing limitation. Ans. 6-7. Appellants argue that Wold does not disclose properties extracted from a digital score and that Smith fails to cure this deficiency. App. Br. 6-7; Reply Br. 2. Appellants also argue that Smith does not teach that a linear scale for plural pitch intervals results as recited in claim 1. App. Br. 7.

ADDITIONAL ISSUES

The additional following issues have been raised in the present appeal:

(4) Under § 103, have Appellants shown that the Examiner erred in rejecting claim 1 by finding the combination of Wold and Smith teaches extracting a musical piece property from a digital score of the musical piece?

(5) Under § 103, have Appellants shown that the Examiner erred in rejecting claim 1 by finding Wold and Smith collectively teach assigning a numerical value to each pitch value of voices in a digital score resulting in a linear scale of the pitch intervals?

ADDITIONAL FINDINGS OF FACT

The record supports the following additional findings of fact (FF) by a preponderance of the evidence.

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Appellants are correct that the Examiner referred to modifying “Collins” in the rejection. Ans. 7. However, the rejection’s heading does not rely on Collins, and the rest of rejection discusses Smith. We, therefore, find this error harmless and presume the Examiner is referring to Smith.
Wold

11. Wold teaches analyzing and extracting various aural or perceptual properties of an audio file or a musical score information. These properties include pitch, loudness, brightness, and scratchiness. Using the properties, database indices based on attributes are created. Wold, at 28-30, 32, and 33.

Smith

12. Smith teaches a process that gives each of two voices a note number. Smith teaches each voice’s note number or pitch source includes a defined pitch set 210, such as ordered set of eight note values. Smith teaches an Octave parameter 218 to transpose up or down octaves. Col. 10, ll. 30-54.

Appellants’ Disclosure

13. The Specification describes voice pitch information having a sequence of tones (e.g., “C D E F G A H c . . . :”) with numerical values (“1, 3, 5, 6, 8, 10, 12, 13, . . .”). Because “the difference of numerical values of neighboring tones is always the same ‘irrespective of the octave,’” a linear scale results. For example, the numerical value difference between “E” and “D” will always be two and between the same tone in neighboring octaves (e.g., “C” to “c”) will always be 12. Spec. 6:1-6.

PRINCIPLES OF LAW

 “[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a prima facie case of unpatentability.” In re Oetiker, 977 F.2d 1443, 1445 (Fed. Cir. 1992). Additionally,
there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness” . . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.


**ANALYSIS**

As discussed above in connection with the anticipation rejection, Wold discloses a digital score. We, thus, refer to our previous discussion in connection with the anticipation rejection. *See* FF 5 and 11. These properties are also used to create database indices that are based on these attributes. *Id.* Thus, in contrast to Appellants’ arguments (App. Br. 6-7), Wold teaches the step of extracting a property from a digital score of a music piece as broadly recited, and Smith is merely cumulative regarding this teaching.

With particular regard to claim 1, the Examiner admits that Wold does not teach the assigning step. Ans. 6. However, as stated above, Wold does teach a process for classifying sounds within a digital score based on their properties, including pitch, to establish a content-based system to search for audio files. FF 4, 5, and 11. Wold further discloses the sounds of the disclosed audio files include laughter and male/female speech – all of which are voices. FF 4. Smith teaches a known technique to assign a particular note number or numerical value to multiple voices. FF 12. Smith teaches
that each voice’s note number or pitch source (i.e., numerical value) includes a defined pitch set 210, such as an ordered set of eight notes. *Id.* Thus, one skilled in the art would have found that Smith’s technique is useful when analyzing voices in Wold’s content based system and the combination of Wold and Smith is no more than a modification or substitution of pitch analysis in Wold for Smith technique when analyzing voices. Such combination would also predictably yield the step of assigning a numerical value to each pitch value of a voice in a digital score. *See KSR,* 550 U.S. at 416.

Appellants further contend that Smith does not disclose a linear scale for plural pitch intervals. The Specification describes this linear scale as having the same difference between numerical values of neighboring tones or notes regardless of the octave. FF 13. Smith teaches a defined and ordered set of note values. *See FF 12.* Taking into account the inferences and creative steps that a person of ordinary skill in the art would employ, one skilled in the art would have recognized that the difference between these note values in an ordered set remains the same. *See KSR,* 550 U.S. at 418. Moreover, as discussed above, Smith also teaches assigning an ordered set of eight note values to a pitch source for a voice, and further suggests an Octave parameter 218 to transpose up and down octaves. FF 12. Taking into account the inferences and creative steps that a person of ordinary skill in the art would employ, one skilled in the art would have equally recognized Smith’s eight note values represent an octave-repeating scale or neighboring tones of a voice. *See KSR,* 550 U.S. at 418. Thus, by using the Octave parameter 218 to transpose up or down octaves, one skilled in the art also would have found that the difference between the ordered set of values
of the combined Wold/Smith process remains fixed regardless of the octave. See FF 12. Such a combination assigns a numerical value to each pitch value of a voice and results in a linear scale of plural pitch interval as recited in claim 1.

Finally, we note that with the exception of independent claim 8’s preamble, there is recitation to a non-acoustical digital score in the claims.

Based on the record before us, the weight of the evidence supports the Examiner’s conclusion that Wold and Smith collectively teach and suggest the limitations of claim 1 and claims 3-19, which fall with claim 1.

CONCLUSIONS

(1) Appellants have not shown the Examiner erred in rejecting claims 11-16 as being directed to non-statutory subject matter.

(2) Appellants have not shown that the Examiner erred in rejecting claims 8-10 by finding that Wold discloses a database capable of storing non-acoustic digital music scores.

(3) Appellants have not shown that the Examiner erred in rejecting claims 11, 17, and 19 by finding that Wold discloses a music piece from a digital score.

(4) Under § 103, Appellants have not shown that the Examiner erred in rejecting claims 1 and 3-19 by finding the combination of Wold and Smith teach extracting a music piece property from a digital score of the music piece.
(5) Under § 103, Appellants have not shown that the Examiner erred in rejecting claims 1 and 3-19 by finding Wold and Smith collectively teach assigning a numeral value to each pitch value of voices in a digital score resulting in a linear scale of the pitch intervals.

DECISION

We have sustained the Examiner's rejection of claims 1 and 3-19.

No 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