United States Court of Appeals for the Federal Circuit

2007-1419

ARISTOCRAT TECHNOLOGIES AUSTRALIA PTY LIMITED
and ARISTOCRAT TECHNOLOGIES, INC.,

Plaintiffs-Appellants,

v.

INTERNATIONAL GAME TECHNOLOGY
and IGT,

Defendants-Appellees.

Brian E. Ferguson, McDermott, Will & Emery LLP, of Washington, DC, argued for plaintiffs-appellants. With him on the brief was Amalie M. Weber. Of counsel on the brief were Terrence P. McMahon, Anthony R. De Alcuaz, and Robert J. Blanch, of Palo Alto, California.

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Appealed from: United States District Court for the District of Nevada

Judge Brian E. Sandoval

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INTERNATIONAL GAME TECHNOLOGY
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Defendants-Appellees.

Appeal from the United States District Court for the District of Nevada in
case no. 05-CV-820, Judge Brian E. Sandoval.

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DECIDED: March 28, 2008

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Before LOURIE, SCHALL, and BRYSON, <u>Circuit Judges</u>.

BRYSON, <u>Circuit Judge</u>.

The appellants, referred to collectively as "Aristocrat," are the owner and exclusive licensee of U.S. Patent No. 6,093,102 ("the '102 patent"). The patent is directed to an electronic slot machine that allows a player to select winning combinations of symbol positions. The appellees, referred to collectively as "IGT," manufacture and sell gaming products that Aristocrat asserts infringe the '102 patent. In an infringement action brought by Aristocrat against IGT in the United States District Court for the District of Nevada, the district court held all of the claims of the '102 patent invalid for indefiniteness.

The game disclosed in the '102 patent purportedly increases player interest in slot machines by providing the player with greater control over the definition of winning opportunities. It allows the player to define the winning opportunities based on symbols displayed on the top and side of a multi-line screen representing slot machine reels. Using the invention on a 3x5 screen, for example, the player can define numerous different arrangements that will allow the player to win for some subset of the 243 possible winning combinations. The player can do so by selecting symbol positions and thereby activating winning opportunities for combinations in which the symbols are not necessarily aligned with one another. The only constraint is that the selected combination must contain at least one symbol from each column. Figure 2 from the '102 patent shows a 3x5 screen with selections, and the figure on the right shows one of the winning combinations for the selection in Figure 2.
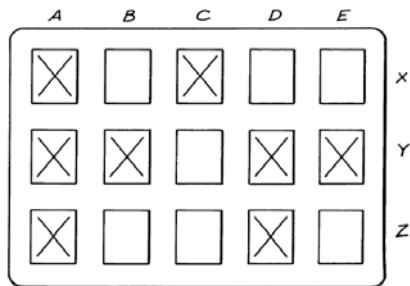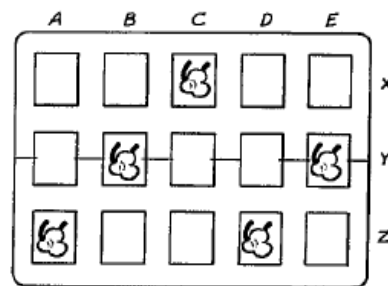

FIG. 2

A winning combination

On summary judgment, the trial court held all of the claims of the '102 patent invalid. Aristocrat does not dispute that all of the claims rise and fall together. Like the parties, we therefore focus on independent claim 1.

Claim 1 reads as follows:

A gaming machine

having display means arranged to display a plurality of symbols in a display format having an array of n rows and m columns of symbol positions,

game control means arranged to control images displayed on the display means,

the game control means being arranged to pay a prize when a predetermined combination of symbols is displayed in a predetermined arrangement of symbol positions selected by a player, playing a game, including one and only one symbol position in each column of the array,

the gaming machine being characterised in that selection means are provided to enable the player to control a definition of one or more predetermined arrangements by selecting one or more of the symbol positions and

the control means defining a set of predetermined arrangements for a current game comprising each possible combination of the symbol positions selected by the player which have one and only one symbol position in each column of the display means,

wherein the number of said predetermined arrangements for any one game is a value which is the product $k_1 \ldots x \ldots k_i \ldots x \ldots k_m$ where k_i is a number of symbol positions which have been selected by the player in an ith column of the n rows by m columns of symbol positions on the display ($0 < i \leq m$ and $k_i \leq n$).

I

The district court observed that the key question in this case is the definiteness of the claim term "game control means" or "control means" that is used several times in claim 1. The court explained that the claim describes the "game control means" as performing three functions: (1) to control images displayed on the display means; (2) to pay a prize when a predetermined combination of symbols matches the symbol

positions selected by the player; and (3) to define the pay lines for the game according to each possible combination of the selected symbol positions.

The district court noted that the parties agreed the term "control means" is a means-plus-function term that invokes 35 U.S.C. § 112 ¶ 6. As such, the scope of that claim limitation had to be defined by the structure disclosed in the specification plus any equivalents of that structure; in the absence of structure disclosed in the specification to perform those functions, the claim limitation would lack specificity, rendering the claim as a whole invalid for indefiniteness under 35 U.S.C. § 112 ¶ 2. See In re Donaldson, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en banc).

The court noted that there were slight linguistic differences in the parties' characterizations of the functions performed by the "control means," but that the differences were unimportant, because there was no adequate disclosure of structure in the specification to perform those functions, regardless of how they were defined. Although Aristocrat argued that the structure corresponding to the recited functions was a standard microprocessor-based gaming machine with "appropriate programming," the court noted that the specification contained no "guidance to determine the meaning of 'standard microprocessor' or 'appropriate programming.'" The court ruled that "[m]erely stating that a standard microprocessor is the structure without more is not sufficient." In particular, the court noted that the specification did not create any specific structure or new machine because "it does not set forth any specific algorithm" for performing the recited function.

Citing decisions of this court, the trial court explained that in a means-plus-function claim "in which the disclosed structure is a computer or a microprocessor

programmed to carry out an algorithm, a corresponding structure must be a specific algorithm disclosed in the specification, rather than merely 'an algorithm executed by a computer.'" Because the specification of the '102 patent lacks "any specific algorithm" or any "step-by-step process for performing the claimed functions of controlling images on the slot machines [sic] video screen, paying a prize when a predetermined combination of symbols comes up or defining the pay lines for games," the court held the asserted structure to be insufficient to satisfy section 112 paragraph 6. In addition, the district court held that the specification did not link the asserted structure to any of the claimed functions. The court held claim 1 invalid for that reason as well.

II

On appeal, Aristocrat first argues that the district court erred by failing to construe the disputed term "game control means" or "control means" in claim 1. Aristocrat argues that because the district court did not construe the functions of the "control means" term under 35 U.S.C. §112 ¶ 6, it could not have properly determined whether the specification recited adequate structure corresponding to those functions.

The district court stated that "[t]he determination as to which function description is the accurate construction is not pertinent to the summary judgment motion because the structure is lacking in description and is not found in the specification." Aristocrat argues that our decision in Oakley, Inc. v. Sunglass Hut Int'l, 316 F.3d 1331, 1340 (Fed. Cir. 2003), requires that a "determination [of definiteness] requires a construction of the claims according to the familiar canons of claim construction."

The district court committed no error in its analysis of the means-plus-function limitation in this case. The court described the two competing claim constructions

proposed by the parties, and the court's description made clear that there was virtually no difference between them. Moreover, the district court, later in its opinion, effectively gave a construction of the functions of the "control means" limitation when it stated that the specification contained no algorithm that described or recited the claimed functions. Describing the claimed functions, the court wrote: "The specification contains no step-by-step process for performing the claimed functions of controlling images on the slot machine's video screen, paying a prize when a predetermined combination of symbols comes up or defining the pay lines for games." That characterization of the claimed functions of the "game control means" is not materially different from the characterization that Aristocrat argues the district court should have adopted in analyzing the means-plus-function limitation. To the extent the court's characterization differs from Aristocrat's, it is only because the court's characterization omits some of the detail found in Aristocrat's characterization. The omission of that detail, however, has no effect on the question whether the specification discloses sufficient structure to perform the claimed functions. In fact, Aristocrat's description of the claimed function would appear to require more by way of specificity in the disclosed structure than would the court's characterization. The district court therefore committed no reversible error with respect to this issue.

<div align="center">III</div>

Aristocrat's principal contention is that the district court was wrong to hold that the patent's disclosure of a general purpose, programmable microprocessor was not a sufficient disclosure of structure to satisfy section 112 paragraph 6. In particular, Aristocrat argues that computer-implemented means-plus-function claims do not require

disclosure of a corresponding algorithm, as held by the district court. Instead, Aristocrat contends that the structure disclosed in the specification of the '102 patent, which was simply "any standard microprocessor base [sic] gaming machine [with] appropriate programming," was a sufficient disclosure of structure under this court's precedents.

In cases involving a computer-implemented invention in which the inventor has invoked means-plus-function claiming, this court has consistently required that the structure disclosed in the specification be more than simply a general purpose computer or microprocessor. The point of the requirement that the patentee disclose particular structure in the specification and that the scope of the patent claims be limited to that structure and its equivalents is to avoid pure functional claiming. As this court explained in Medical Instrumentation & Diagnostics Corp. v. Elekta AB, 344 F.3d 1205, 1211 (Fed. Cir. 2003), "If the specification is not clear as to the structure that the patentee intends to correspond to the claimed function, then the patentee has not paid the price but is attempting to claim in functional terms unbounded by any reference to structure in the specification." See also Biomedino, LLC v. Waters Techs. Corp., 490 F.3d 946, 948 (Fed. Cir. 2007) ("[I]n return for generic claiming ability, the applicant must indicate in the specification what structure constitutes the means."). For a patentee to claim a means for performing a particular function and then to disclose only a general purpose computer as the structure designed to perform that function amounts to pure functional claiming. Because general purpose computers can be programmed to perform very different tasks in very different ways, simply disclosing a computer as the structure designated to perform a particular function does not limit the scope of the claim to "the

corresponding structure, material, or acts" that perform the function, as required by section 112 paragraph 6.

That was the point made by this court in <u>WMS Gaming, Inc. v. International Game Technology</u>, 184 F.3d 1339 (Fed. Cir. 1999). In that case, the court criticized the district court, which had determined that the structure disclosed in the specification to perform the claimed function was "an algorithm executed by a computer." The district court erred, this court held, "by failing to limit the claim to the algorithm disclosed in the specification." <u>Id.</u> at 1348. The rationale for that decision is equally applicable here: a general purpose computer programmed to carry out a particular algorithm creates a "new machine" because a general purpose computer "in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software." <u>Id.</u>, <u>quoting</u> <u>In re Alappat</u>, 33 F.3d 1526, 1545 (Fed. Cir. 1994). The instructions of the software program in effect "create a special purpose machine for carrying out the particular algorithm." <u>WMS Gaming</u>, 184 F.3d at 1348. Thus, in a means-plus-function claim "in which the disclosed structure is a computer, or microprocessor, programmed to carry out an algorithm, the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm." <u>Id.</u> at 1349.

In a later case, this court made the same point, stating that a "computer-implemented means-plus-function term is limited to the corresponding structure disclosed in the specification and equivalents thereof, and the corresponding structure is the algorithm." <u>Harris Corp. v. Ericsson Inc.</u>, 417 F.3d 1241, 1253 (Fed. Cir. 2005). The court in that case characterized the rule of <u>WMS Gaming</u> as follows: "[T]he

corresponding structure for a § 112 ¶ 6 claim for a computer-implemented function is the algorithm disclosed in the specification." 417 F.3d at 1249.

In this case, Aristocrat acknowledges that the only portion of the specification that describes the structure corresponding to the three functions performed by the "control means" is the statement that it is within the capability of a worker in the art "to introduce the methodology on any standard microprocessor base [sic] gaming machine by means of appropriate programming." '102 patent, col. 3, ll. 2-4. That description goes no farther than saying that the claimed functions are performed by a general purpose computer. The reference to "appropriate programming" imposes no limitation whatever, as any general purpose computer must be programmed. The term "appropriate programming" simply references a computer that is programmed so that it performs the function in question, which is to say that the function is performed by a computer that is capable of performing the function.

Aristocrat offers two responses to the district court's conclusion that the patent did not disclose sufficient structure. First, Aristocrat argues that the specification disclosed algorithms that were sufficient to constitute a qualifying disclosure of structure. Second, Aristocrat argues that no disclosure of specific algorithms was necessary in any event.

A

As to the first argument, Aristocrat contends that the language of claim 1 referring to "the game control means being arranged to pay a prize when a predetermined combination of symbols is displayed in a predetermined arrangement of symbol positions selected by a player" implicitly discloses an algorithm for the

microprocessor. That is, when the winning combination of symbols is displayed, the program should pay a prize. But that language simply describes the function to be performed, not the algorithm by which it is performed. Aristocrat's real point is that devising an algorithm to perform that function would be within the capability of one of skill in the art, and therefore it was not necessary for the patent to designate any particular algorithm to perform the claimed function. As we have noted above, however, that argument is contrary to this court's law.

Aristocrat also points to language in claim 1 that, according to Aristocrat, "sets forth the mathematical equation that describes the result of practicing the third function." The language in question recites "defining a set of predetermined arrangements for a current game comprising each possible combination of the symbol position selected by the player which have one and only one symbol position in each column of the display means." The problem with Aristocrat's argument is underscored by Aristocrat's very characterization of the role of the equation: It describes the result of practicing the third function. That is, the equation is not an algorithm that describes how the function is performed, but is merely a mathematical expression that describes the outcome of performing the function. To be sure, as Aristocrat argues, the equation "restricts 'appropriate programming' to algorithms which result in the specified number of winning opportunities." But that argument simply concedes that the equation describes an outcome, not a means for achieving that outcome. The equation thus does not disclose the structure of the claimed device, but is only another way of describing the claimed function.

Finally, Aristocrat contends that "the written description delineates what constitutes 'appropriate programming' through the disclosed embodiments of the invention." Again, however, the description of the embodiments is simply a description of the outcome of the claimed functions, not a description of the structure, i.e., the computer programmed to execute a particular algorithm.

In making this argument, Aristocrat relies on Figure 1 and Table 1 from the patent, which provide examples of how player selections translate to possible winning combinations:
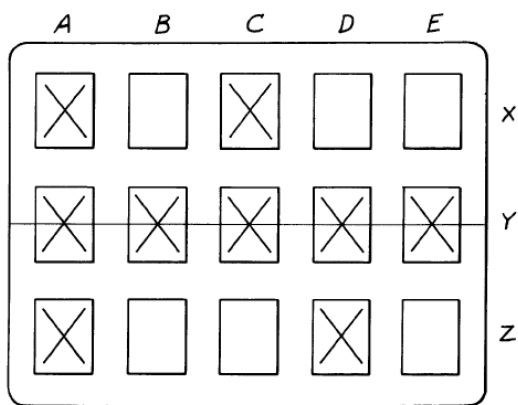

FIG. 1

TABLE 1

LINE NO	DISPLAY POSITIONS USED				
1	AX	BY	CX	DY	EY
2	AX	BY	CX	DZ	EY
3	AX	BY	CY	DY	EY
4	AX	BY	CY	DZ	EY

TABLE 1-continued

LINE NO	DISPLAY POSITIONS USED				
5	AY	BY	CX	DY	EY
6	AY	BY	CX	DZ	EY
7	AY	BY	CY	DY	EY
8	AY	BY	CY	DZ	EY
9	AZ	BY	CX	DY	EY
10	AZ	BY	CX	DZ	EY
11	AZ	BY	CY	DY	EY
12	AZ	BY	CY	DZ	EY

Two other pairs of figures and tables, Figures 3 and 4, and Tables 2 and 3, offer similar examples. The corresponding portion of the written description contains mathematical descriptions of how many winning combinations would be produced. '102 patent, col. 3, line 54, through col. 5, line 21. Aristocrat refers to these examples as "algorithms." The figures, tables, and related discussion, however, are not algorithms. They are simply examples of the results of the operation of an unspecified algorithm. Like the mathematical equation set forth in claim 1, these combinations of figures and

tables are, at best, a description of the claimed function of the means-plus-function claim.

Aristocrat has elected to claim using section 112 paragraph 6 and therefore must disclose corresponding structure. It has disclosed, at most, pictoral and mathematical ways of describing the claimed function of the game control means. That is not enough to transform the disclosure of a general-purpose microprocessor into the disclosure of sufficient structure to satisfy section 112 paragraph 6.

<div align="center">B</div>

In support of the contention that it is not necessary to disclose a particular algorithm in order to disclose sufficient structure for a means-plus-function limitation in a computer-implemented invention, Aristocrat relies primarily on In re Dossel, 115 F.3d 942 (Fed. Cir. 1997). Aristocrat argues that the application in Dossel did not disclose a particular algorithm, and that the court held the disclosure sufficient even though the application stated, with respect to the performance of one of the claimed functions, that "[k]nown algorithms can be used for this purpose."

The means-plus-function limitation at issue in Dossel was a "means for reconstructing the current distribution" on the surface of an element inside a biological object, such as on the surface of a tumor inside a human brain. The application stated that the reconstruction unit would reconstruct the density of the current at various points on that surface from the values of the magnetic flux density at corresponding pixels at the same time. See U.S. Patent No. 5,885,215, col. 4, ll. 6-10 (the patent that issued from the Dossel application). The application explained that "[k]nown algorithms can be used for this purpose." Id., col. 4, ll. 10-11. The application then provided the particular

equation by which the relationship between the values of magnetic flux density and current density could be described in matrix form, id., col. 4, ll. 12-15, and it described in great detail the components of that equation, id., col. 4, ll. 16-55. Accordingly, while providing a detailed explanation of how the claimed device would perform the claimed function, the specification left the mathematical techniques used to solve the recited equations to persons of ordinary skill in the art. That is what this court referred to when it stated that the application stated "that 'known algorithms' can be used to solve standard equations which are known in the art." Dossel, 115 F.3d at 946.

From the context and from reviewing the application, it is clear that the Dossel court used the term "algorithm" in a narrow sense, referring to particular well-known mathematical operations that could be used to solve the equations disclosed in the application. Far from supporting Aristocrat's claim that a reference to a general purpose computer with "appropriate programming" discloses sufficient structure for section 112 paragraph 6, the Dossel case provides an example of an extremely detailed disclosure of all information necessary to perform the function, except for basic mathematical techniques that would be known to any person skilled in the pertinent art.

Aristocrat also argues that, even if there is no disclosure of an algorithm in the patent, the disclosure of a microprocessor with "appropriate programming" is a sufficient disclosure of structure for means-plus-function purposes, because the evidence showed that one of ordinary skill in the art could build the device claimed in the '102 patent based on the disclosure in the specification. That argument, however, conflates the requirement of enablement under section 112 paragraph 1 and the requirement to disclose the structure that performs the claimed function under section 112 paragraph 6.

Although the examples given in the '102 patent might enable one of ordinary skill to make and use the invention, they do not recite the particular structure that performs the function and to which the means-plus-function claim is necessarily limited.

Whether the disclosure would enable one of ordinary skill in the art to make and use the invention is not at issue here. Instead, the pertinent question in this case is whether Aristocrat's patent discloses structure that is used to perform the claimed function. Enablement of a device requires only the disclosure of sufficient information so that a person of ordinary skill in the art could make and use the device. A section 112 paragraph 6 disclosure, however, serves the very different purpose of limiting the scope of the claim to the particular structure disclosed, together with equivalents. The difference between the two is made clear by an exchange at oral argument. In response to a question from the court, Aristocrat's counsel contended that, in light of the breadth of the disclosure in the specification, any microprocessor, regardless of how it was programmed, would infringe claim 1 if it performed the claimed functions recited in the means-plus-function limitations of that claim. That response reveals that Aristocrat is in essence arguing for pure functional claiming as long as the function is performed by a general purpose computer. This court's cases flatly reject that position.

For example, in Atmel Corp. v. Information Storage Devices, Inc., 198 F.3d 1374, 1380 (Fed. Cir. 1999), the court embraced the proposition that "consideration of the understanding of one skilled in the art in no way relieves the patentee of adequately disclosing sufficient structure in the specification." It is not enough for the patentee simply to state or later argue that persons of ordinary skill in the art would know what structures to use to accomplish the claimed function. The court in Biomedino, LLC v.

Waters Technologies Corp., 490 F.3d 946, 953 (Fed. Cir. 2007), put the point this way: "The inquiry is whether one of skill in the art would understand the specification itself to disclose a structure, not simply whether that person would be capable of implementing that structure." Discussing Atmel, the court in Biomedino stated:

> In Atmel, it was not the fact that one skilled in the art was aware of known circuit techniques that resulted in a conclusion that sufficient structure was recited. Rather, it was the inclusion in the written description of the title of [a technical article] which itself described the structure for a "known circuit technique." Expert testimony was used to show what the title of the article would convey to one skilled in the art—in this case it was the "precise structure of the means recited in the specification." . . . The expert's testimony did not create or infer the structure.

490 F.3d at 952.

Aristocrat relies on a statement from the recent decision of this court in AllVoice Computing PLC v. Nuance Communs., Inc., 504 F.3d 1236, 1245 (Fed. Cir. 2007), where the court stated that in software cases "algorithms in the specification need only disclose adequate defining structure to render the bounds of the claim understandable to one of ordinary skill in the art." We similarly stated in Medical Instrumentation & Diagnostics Corp. v. Elekta AB, 344 F.3d 1205, 1214 (Fed. Cir. 2003), that "there would be no need for a disclosure of the specific program code if software were linked to the . . . function and one skilled in the art would know the kind of program to use."

It is certainly true that the sufficiency of the disclosure of algorithmic structure must be judged in light of what one of ordinary skill in the art would understand the disclosure to impart. See, e.g., Intel Corp. v. VIA Techs., 319 F.3d 1357, 1367 (Fed. Cir. 2003) (knowledge of a person of ordinary skill in the art can be used to make clear how to implement a disclosed algorithm); Atmel Corp., 198 F.3d at 1379 ("[T]he 'one

skilled in the art' analysis should apply in determining whether sufficient structure has been disclosed to support a means-plus-function limitation."). That principle, however, has no application here, because in this case there was no algorithm at all disclosed in the specification. The question thus is not whether the algorithm that was disclosed was described with sufficient specificity, but whether an algorithm was disclosed at all.

In Medical Instrumentation, we held that the proper inquiry for purposes of section 112 paragraph 6 analysis is to "look at the disclosure of the patent and determine if one of skill in the art would have understood that disclosure to encompass software [to perform the function] and been able to implement such a program, not simply whether one of skill in the art would have been able to write such a software program." 344 F.3d at 1212 (emphasis in original). We then stated that it is "not proper to look to the knowledge of one skilled in the art apart from and unconnected to the disclosure of the patent." Id. That is precisely the inquiry the district court performed and that we reviewed above. Here, as in Medical Instrumentation, the patent does not disclose the required algorithm or algorithms, and a person of ordinary skill in the art would not recognize the patent as disclosing any algorithm at all. Accordingly, the means-plus-function limitations of claim 1 lacked sufficient disclosure of structure under 35 U.S.C. § 112 ¶ 6 and were therefore indefinite under 35 U.S.C. § 112 ¶ 2.

IV

Aristocrat was not required to produce a listing of source code or a highly detailed description of the algorithm to be used to achieve the claimed functions in order to satisfy 35 U.S.C. § 112 ¶ 6. It was required, however, to at least disclose the algorithm that transforms the general purpose microprocessor to a "special purpose

computer programmed to perform the disclosed algorithm." <u>WMS Gaming</u>, 184 F.3d at 1349. Because the district court correctly held that was not done in this case, we uphold the judgment of the district court.

<u>AFFIRMED</u>.