United States Court of Appeals for the Federal Circuit

RICHARD GRAMM, REAPER SOLUTIONS LLC, FKA HEADSIGHT, INC.,
Plaintiffs-Appellants

v.

DEERE & COMPANY,
Defendant-Appellee

2024-1598

Appeal from the United States District Court for the Southern District of Iowa in No. 3:22-cv-00010-RGE-SBJ, Judge Rebecca Goodgame Ebinger.

Decided: March 11, 2026

CHRISTOPHER A. YOUNG, Larkin Hoffman Daly & Lindgren, Ltd., Minneapolis, MN, argued for plaintiffs-appellants. Also represented by JOHN COTTER, THOMAS JOHN OPPOLD.

LAURA A. LYDIGSEN, Crowell & Moring LLP, Chicago, IL, argued for defendant-appellee. Also represented by JUDY HE, MARY LAFLEUR, JEFFRY M. NICHOLS.

Before LOURIE, REYNA, and CUNNINGHAM, *Circuit Judges*.

REYNA, *Circuit Judge*.

Reaper Solutions, LLC and Richard Gramm appeal an order of the United States District Court for the Southern District of Iowa concluding the asserted claims of U.S. Patent No. 6,202,395 are invalid as indefinite and entering a judgment in favor of Deere based on that conclusion. We reverse the district court's indefiniteness conclusion and judgment of invalidity and remand for further proceedings consistent with this opinion.

I. BACKGROUND

Richard Gramm is the sole inventor and owner of U.S. Patent No. 6,202,395 (the "'395 patent"), which he licenses exclusively to Reaper Solutions, LLC.[1] The '395 patent is directed to an apparatus for maintaining the header of a crop harvester a desired height above the ground as the harvester traverses a field. J.A. 45 at 1:10–13. Figure 1 of the '395 patent, reproduced below, depicts an embodiment of a harvester (10) including a header (12).

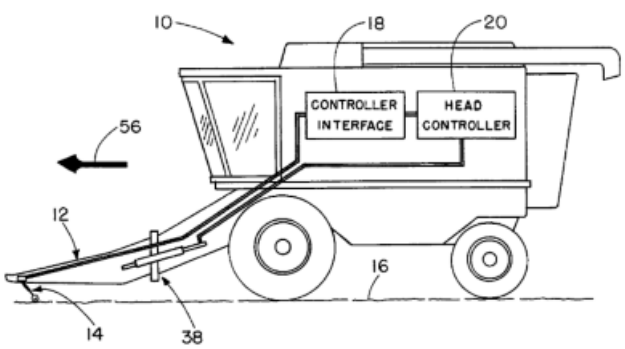

FIG. 1

[1] Reaper Solutions, LLC was formerly known as Headsight, Inc.

J.A. 41 at Fig. 1.

Gramm and Reaper Solutions, LLC (collectively, "Reaper") sued Deere & Company ("Deere") in district court in 2014[2] alleging that certain Deere header sensor kits infringed the '395 patent. Deere then challenged the '395 patent in *inter partes* review, after which (including this court's appellate review in *Deere & Co. v. Gramm*, 842 F. App'x 628, 631 (Fed. Cir. 2021)) only independent claim 12 and certain of its dependents remained asserted. Claim 12 recites in relevant part:

> 12. Apparatus for maintaining a non-cut crop header in a crop harvester a designated height above the soil as the crop harvester traverses a field, said apparatus comprising:
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> ***
>
> ***control means*** coupled to said header and said angular deflection sensing means and responsive to said first signal ***for raising or lowering the header in accordance with said first signal in maintaining the header a designated height above the soil***, wherein said flexible arm and angular deflection sensing means are attached to a head housing disposed on a forward portion of said combine and said head housing is comprised of polyurethane and includes a metal tip and a mounting bracket for attaching said metal tip to a forward end of said head housing, and wherein said mounting bracket further couples said flexible arm to a forward end of said head housing.

J.A. 48 at 8:22–61 (emphases added).

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[2] Reaper initially filed suit in the United States District Court for the Northern District of Indiana, and the case was later transferred to the Southern District of Iowa.

During claim construction, Deere and Reaper (the "parties") disputed the meaning of "control means" in claim 12. The parties agreed that "control means" is a means-plus-function limitation that invokes 35 U.S.C. § 112(f).[3] Reaper identified, and Deere did not dispute, that the claimed function associated with control means is "raising and lowering the header . . . a designated height above the soil." And the parties agreed that the corresponding structure described in the '395 patent specification is the "controller interface 18," "head controller 20," and "hydraulic control system 38" features together in combination. J.A. 1196, 1944, 3193. The parties also agreed that those features are described in the specification at column 3, lines 33–52:

> The corn head height sensor 14 is connected by a suitable electrical means to a controller interface 18 and a head controller 20 within combine 10. In response to the detected height of the corn header 12, ***head controller 20 provides suitable electrical control signals to an electrically actuated, hydraulic control system 38 for controlling the lateral position of the corn header 12 as well as its height above the ground, or soil, 16*** as the combine 10 traverses a field in the direction of arrow 56. ***Head controller 20 is conventional in design and operation*** and, in general, receives an analog electrical signal from the controller interface 18 and outputs an analog signal to the hydraulic control system

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[3] The '395 patent issued in 2001, before the Leahy-Smith America Invents Act ("AIA") went into effect in 2013. Therefore, the "control means" limitation is governed by pre-AIA § 112 ¶6. As the parties did in briefing, we refer herein to AIA statute § 112(f), which uses the same language as the pre-AIA statute.

> 38. . . . ***In a specific embodiment of the present invention, head controller 20 is as incorporated in a Deere combine***, while controller interface 18 is available from May-Wes.

J.A. 46, 1196, 1938 (emphases added).

The parties disputed, however, whether the specification's disclosure of the "head controller 20" feature of the corresponding structure is sufficiently definite. Deere contended that it is not, because the "head controller 20" that is "conventional in design" disclosed in the specification "amounts to a computer or processor," and therefore the specification "must also disclose the algorithm by which the computer or processor works to accomplish the claimed function." J.A. 1940–41 (citing *HTC Corp. v. IPCom GmbH & Co., KG*, 667 F.3d 1270, 1280 (Fed. Cir. 2012)).

Deere also argued that the reference to head controller 20 being "as incorporated in a Deere combine" as of 1997 (the priority date of the '395 patent) further confirms the specification must disclose an algorithm to satisfy the definiteness requirement. As context, the '395 patent specification does not explicitly name any commercially available head controllers used in Deere combines. Instead, it includes the following general reference to commercial embodiments: "In a specific embodiment of the present invention, head controller 20 is as incorporated in a Deere combine."[4] J.A. 46 at 3:49–51. Reaper submitted expert

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[4] As a threshold matter, our precedent allows commercial embodiments to serve as corresponding structure for means-plus-function limitations even where the specification only generically references "commercially available" devices, so long as a skilled artisan would understand the structure described. *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1381–82 (Fed. Cir. 2001) (holding disclosure of "vacuum sensors" as "commercially available units

testimony that, as of 1997, a skilled artisan would have known there were three commercially available head controllers used in Deere combines—Dial-A-Matic Versions #1, #2, and #3. Deere agreed that these three models were commercially available as of 1997.

Deere argued, however, that only Dial-A-Matic Versions #2 and #3 could be corresponding structure. It identified these two models specifically because they could control *both* header height *and* lateral position, as it argued was required by the pertinent passage from column 3 of the specification. Notably, Deere excluded from its identification of commercially available models referenced in the specification the Dial-A-Matic Version #1. Deere argued that "the ['395 patent] specification could not possibly have been referring to this controller" because Dial-A-Matic Version #1 "did ***not*** control the lateral position" of the header, which the relevant specification passage discloses is a function performed by the head controller. J.A. 1942 (emphasis in original).

Deere submitted with its claim construction briefing a fact declaration from a retired Deere engineer, Dr. Miller, explaining the operation of Dial-A-Matic Versions #1, #2, and #3. Relying on Dr. Miller's declaration, Deere argued that Dial-A-Matic Versions #2 and #3 used microprocessors to control header height, and therefore the '395 patent specification must disclose an algorithm for performing the claimed function. Deere then argued that claim 12 is indefinite because the specification fails to disclose such an algorithm.

Deere also proposed an alternative construction in the event the district court rejected its indefiniteness argument. Deere argued that, even if the Court did not find

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which produce analog signals for the control unit" satisfies the definiteness requirement).

"control means" indefinite for lack of an algorithm, it should "hold Plaintiffs to their argument that the 'controller' is specifically Deere's [Dial-A-Matic Version #1]," which "controlled header height through a series of diodes, switches, and integrated circuits, rather than through a microprocessor." J.A. 1944.

In its ruling, the district court accepted Deere's argument that the specification does not disclose Dial-A-Matic Version #1 as corresponding structure:

> The record indicates the Dial-A-Matic Version #1 controller would not be understood as within the scope of the conventional controllers referenced because the specification clearly indicates "head controller 20 provides suitable electrical control signals to an electrically actuated, hydraulic control system 38 for controlling the lateral position of the corn header 12." . . . Dial-A-Matic Version #1 lacks this capacity, whereas Version #2 does not.

J.A. 30. The district court found that the specification's "reference to either Dial-A-Matic Version #2 or #3 provides sufficient support for the conclusion that the specification's disclosure of a head controller amounts to the disclosure of a general-purpose computer or microprocessor." J.A. 32. It then found that the '395 patent fails to disclose an algorithm as part of the structure associated with "control means" and is therefore indefinite. J.A. 37. The district court entered judgment against Reaper, J.A. 19, and Reaper timely appealed. We have jurisdiction under 28 U.S.C. § 1295(a)(1).

II. LEGAL STANDARD

Means-plus-function claiming allows a patentee "to express a claim limitation by reciting a function to be performed rather than by reciting structure for performing that function, while placing specific constraints on how such a limitation is to be construed." *Williamson v. Citrix*

Online, LLC, 792 F.3d 1339, 1347 (Fed. Cir. 2015). District courts undertake a two-step analysis when construing means-plus-function terms. First, the court must identify the function the means performs that is recited in the claim. *Id.* at 1351. Second, the court must determine "what structure, if any, disclosed in the specification corresponds to the claimed function." *Id.* To qualify as corresponding structure, the intrinsic evidence must "clearly link[] or associate[] that structure to the function recited in the claim." *Id.* at 1352. District courts must limit the relevant limitation to *only* that structure corresponding to the claimed function and equivalents thereof, nothing more. *See id.* at 1347. If the specification fails to disclose "adequate corresponding structure" to perform the claimed function, the claim is indefinite under 35 U.S.C. § 112(b). *Id.* at 1352.

The corresponding structure analysis for computer-implemented means-plus-function terms compels a certain nuance. This court's decision in *WMS Gaming, Inc. v. International Game Technology* established that "[t]he structure of a [computer or] microprocessor programmed to carry out an algorithm is limited by the disclosed algorithm." 184 F.3d 1339, 1348 (Fed. Cir. 1999). This is because a general-purpose computer or microprocessor could be programmed to perform a certain task in "very different ways." *Aristocrat Techs. Austl. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008). Particular programming converts the general-purpose computer or microprocessor into a "special purpose machine for carrying out" a particular function. *Id.* Thus, to satisfy the adequate corresponding structure requirement, computer-implemented means-plus-function terms must have a corresponding algorithm disclosed in the specification. *HTC Corp.*, 667 F.3d at 1280.

III. STANDARD OF REVIEW

Claim construction determinations based on intrinsic evidence, including whether claim language invokes or is indefinite under 35 U.S.C. § 112(f), are reviewed de novo. *Williamson*, 792 F.3d at 1346. Underlying factual determinations based on extrinsic evidence are reviewed for clear error. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 332 (2015). Under the clear error standard, "a reversal is permitted only when this court is left with a definite and firm conviction that the district court was in error." *Alza Corp. v. Mylan Labs., Inc.*, 464 F.3d 1286, 1289 (Fed. Cir. 2006).

IV. DISCUSSION

Reaper challenges the district court's means-plus-function analysis from several angles. First, Reaper argues the district court erred by conducting the two-step means-plus-function analysis out of order. Appellant Br. 23–25. This argument is without merit. Citing *Williamson*, the district court's order recites the proper two-step analysis. J.A. 26. Nothing in the order suggests the district court failed to identify the claimed function before proceeding to identify corresponding structure.

Second, Reaper argues the district court erred in its determination of the claimed function. Appellant Br. 25–29. This argument is also without merit. The district court's order explicitly identifies "the claimed function of 'raising and lowering the header in accordance with said first signal in maintaining the header a designated height above the soil.'" J.A. 29. This is the same claimed function that Reaper identifies. Appellant Br. 26.

Reaper's third argument catches traction. Reaper argues the district court erred by identifying corresponding structure for "control means" beyond that which is necessary to perform the claimed function. *Id.* at 26–30. We agree the district court erred, and that this error in turn

caused the district court to find claim 12 indefinite. But the court erred, not in identifying corresponding structure beyond that which is necessary to perform the claimed function, but by failing to recognize that the specification's statement at column 3, lines 33–52, in addition to noting that head controller 20 provides signals for controlling the lateral position of the corn header, *also* does so for controlling "its height above the ground," thus providing structure for the claimed "control means." A disclosure of an added function in the specification should not disqualify structure that meets the means clause's requirements. For this reason, and as discussed below, we reverse the district court's indefiniteness conclusion (and associated judgment against Reaper) and remand for further proceedings.

A. Corresponding Structure

Our jurisprudence is well-settled that a means-plus-function claim limitation covers "only the structure . . . corresponding to the claimed function and equivalents thereof." *Williamson*, 792 F.3d at 1347.

Here, the district court erred by discounting structure that performs the claimed function in claim 12. As we noted above, the district court analyzed the first step properly, identifying the claimed function as "raising and lowering the header . . . a designated height above the soil." J.A. 29. But when turning to the specification for the second step, the district court discounted corresponding structure that performs the claimed function because it did not perform the unclaimed function of controlling "lateral position" of the header. J.A. 29–30. Indeed, Deere's counsel confirmed at oral argument that the district court used the "lateral position" capability as a "clue" for determining corresponding structure. Oral Arg., 16:20–34, https://www.cafc.uscourts.gov/oral-arguments/24-1598_12082025.mp3 ("And so [the district court judge] knew from that passage that the controller referenced later, the one that Reaper said was the clearly linked structure, had to

be something other than the Dial-A-Matic #1, because all of the evidence before her showed that the Dial-A-Matic #1 didn't have th[e] capacity [to control lateral positioning]."). Deere's counsel also admitted this capability is not necessary for performing the claimed function. *Id.* at 16:38–46 (**Q**: "But is that lateral positioning even necessary to the function of the claim limitation in dispute here? **A**: No it's not, your honor . . . .").

This court confronted a similar circumstance in *Wenger Manufacturing, Inc. v. Coating Machinery Systems, Inc.*, 239 F.3d 1225 (Fed. Cir. 2001). There, we found a district court erred by interpreting "air circulation means" to require structure capable of performing the unclaimed function of "recirculating air" in addition to the recited function of circulating air. *Wenger*, 239 F.3d at 1231–33. We found the district court "improperly restricted the 'air circulation means' limitation to structure that was disclosed in the preferred embodiment, but was not necessary to perform the recited function of circulating air." *Id.* at 1233. Here, the district court likewise erred by restricting structure capable of performing the claimed function of controlling header height.

Our holding in *Golight, Inc. v. Wal-Mart Stores, Inc.*, 355 F.3d 1327 (Fed. Cir. 2004) is also instructive. There, we considered the means-plus-function claim limitation "horizontal drive means" for "rotating said lamp unit in a horizontal direction." *Golight*, 355 F.3d at 1334–35. We declined to import a requirement that corresponding structure must be capable of rotating the lamp unit at least 360 degrees, even where the single embodiment of the invention disclosed rotation of at least 360 degrees. *Id.* We similarly here decline to disqualify the structure corresponding to "control means" because it is not also capable of controlling lateral positioning of the header.

The district court's erroneous identification of corresponding structure precipitated its conclusion that

claim 12 is indefinite. The district court excluded Deere's Dial-A-Matic Version #1 from its identification of corresponding structure because that version lacked the capability to control lateral position of the header. And because the district court was persuaded that both the Dial-A-Matic Versions #2 and #3 use microprocessors to control header height, it found that the '395 patent specification must disclose an algorithm to satisfy the definiteness requirement. Finding the specification lacked such an algorithm, the district court held claim 12 indefinite.

The district court's improper restriction of corresponding structure provided the basis for its exclusion of Dial-A-Matic Version #1. There is no dispute that Dial-A-Matic Version #1 was commercially available as of 1997. And Deere conceded in its claim construction briefing that Dial-A-Matic Version #1 uses logic circuitry—not a microprocessor—to raise and lower the header.[5] J.A. 1944 ("Deere's Dial-a-Matic [Version #1] . . . controlled header height through a series of diodes, switches, and integrated circuits, rather than through a microprocessor."); *see also* Appellee Br. 9 (citing J.A. 2474 ¶ 8), 36; Appellant Br. 31–32. Under our precedent, the Dial-A-Matic Version #1 is therefore "not a general-purpose computer [and] does not trigger the algorithm requirement." *See Qualcomm Inc. v. Intel Corp.*, 6 F.4th 1256, 1267 (Fed. Cir. 2021) ("The reasoning for the algorithm requirement of *WMS Gaming* does not apply to functions implemented through circuitry."). Thus, we find the district court clearly erred by excluding the Dial-A-Matic Version #1 as corresponding structure.

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[5] Deere's argument on appeal that it never conceded the Dial-A-Matic Version #1 operates in this fashion is belied by the record. Appellee Br. 31–32. We find that Deere unequivocally admitted this to be true both before the district court and in this appeal. J.A. 1944; Appellee Br. 9, 36.

Because Dial-A-Matic Version #1 is properly disclosed as corresponding structure, we hold the district court erred by determining that "control means" is indefinite.[6] *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 1113–14 (Fed. Cir. 2002) ("[A] claim is valid even if only one embodiment discloses corresponding structure."). We reverse the district court's conclusion of indefiniteness and judgment of invalidity and remand to the district court for further proceedings consistent with this opinion.

B. Dial-A-Matic Versions #2 and #3

We now turn to the question of whether the district court clearly erred by finding Dial-A-Matic Versions #2 and #3 are not adequately disclosed because those versions (1) trigger an algorithm requirement, and (2) lack a corresponding algorithm in the '395 patent specification. We find no error as to either.

To the first issue, the district court's determination that the Dial-A-Matic Versions #2 and #3 require a corresponding algorithm in the specification to be sufficiently definite is not clearly erroneous. The district court considered Dr. Miller's fact declaration[7] regarding the operation

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[6] Further, as we noted above, Deere argued to the district court in claim construction briefing that, if it did not conclude "control means" was indefinite, it should find Dial-A-Matic Version #1 is corresponding structure. J.A. 1944.

[7] Reaper also argues the district court erred by treating Dr. Miller, a fact declarant, as an expert witness. Appellant Br. 51–52. Regardless of the nomenclature the district court assigned Dr. Miller in its ruling, the district court permissibly relied on the declaration of Dr. Miller—a fact witness with first-hand knowledge of the Dial-A-Matic head controllers—as evidence of how those head controllers operate. But going forward, the district court should be

of those two models. J.A. 33. Dr. Miller declared that each of Versions #2 and #3 consisted of a "microprocessor-based controller" that was "programmed with software to control [] header height." Appellee Br. 9–11 (citing J.A. 2474–78, ¶¶ 9, 10, 14, 15). Dr. Miller also attached to his declaration print-outs of Deere's proprietary software code for Versions #2 and #3. *Id.* (citing J.A. 2479–506, 2643–894). He referred to sections of those attachments that introduce the code as controlling header height. *Id.* In light of this evidence, we find the district court did not clearly err by determining the Dial-A-Matic Versions #2 and #3 use microprocessors to control header height and therefore require an algorithm.

To the second issue, the district court's determination by clear and convincing evidence that the '395 patent lacks a prose algorithm[8] is also not clearly erroneous. Specifically, the district court did not clearly err by discrediting Reaper's expert's testimony that the '395 patent discloses a three-step prose algorithm. The district court's order walks through Mr. Smith's opinion as to how the specification purportedly discloses each of the three steps, concluding that the cited portions of the specification "do no more than restate the functions set forth in claim 12." J.A. 34–37 (citing *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1317 (Fed. Cir. 2012) ("[P]urely functional language, which simply restates the function associated with the means-plus-function limitation, is insufficient to provide

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mindful that Dr. Miller is a fact witness, not an expert witness.

[8] An algorithm need not be disclosed in computer code. "A description of the function in words may disclose, at least to the satisfaction of one of ordinary skill in the art, enough of an algorithm to provide the necessary structure under § 112(f)." *Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1386 (Fed. Cir. 2011) (citation modified).

the required corresponding structure.")). And notably, the district court found that Reaper's support for the second step of the purported prose algorithm was "not drawn from the specification at all" and that Mr. Smith merely "cite[d] directly to the language in claim 12 on which Plaintiffs rely for their statement of function in their proposed construction." J.A. 35–36. We see no clear error here.

C. Equivalents

Reaper also argues the district court erred because it failed to consider whether "control means" should be construed to include Dial-A-Matic Version #1 as an equivalent structure to Dial-A-Matic Version #2.[9] Appellant Br. 44–46. Reaper avers that "[a]lthough the court understood that it was required to construe 'control means' to include equivalents of the corresponding structure, it failed to consider the issue of equivalents." Appellant Br. 46. Reaper's argument reflects a fundamental misunderstanding of our precedent and the means-plus-function analysis.

As we discuss above, the claim construction process for means-plus-function limitations is two-fold. First, the court must identify the claimed function. Second, the court must ascertain any corresponding structure disclosed in the specification. District courts are not required to undertake an analysis during claim construction to determine what equivalents may exist in the abstract. Instead, the equivalents analysis pertains to whether an accused product is an equivalent structure that literally infringes a

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[9] As discussed above, we find that Dial-A-Matic Version #1 is properly within the scope of corresponding structure, and thus we need not address this exact issue. Because we remand for further proceedings, we address whether the district court must assess whether Dial-A-Matic Versions #2 and #3 are equivalent to Dial-A-Matic Version #1.

means-plus-function limitation. *Intellectual Sci. & Tech., Inc. v. Sony Elecs., Inc.*, 589 F.3d 1179, 1183 (Fed. Cir. 2009) ("For a means-plus-function claim term, the term literally covers an accused device if the relevant structure in the accused device performs the identical function recited in the claim and that structure is identical or equivalent to the corresponding structure disclosed in the specification."). Thus, for purposes of claim construction, the district court need only ascertain the corresponding structure disclosed in the specification, not what equivalents may exist.

V. CONCLUSION

We have considered the parties' remaining arguments and find them unpersuasive. For the foregoing reasons, we reverse the district court's determination that "control means" is indefinite. We remand to the district court for further proceedings in accordance with this opinion.

REVERSED AND REMANDED

COSTS

Costs against Deere.