

**Keywords:** Claim construction; prosecution history estoppel; infringement; mootness.

**General:** In construing claims, it is erroneous to consider intrinsic evidence outside of the claim language (written description, figures, and the prosecution history) if the claim language is clear and its meaning is not contradicted by the written description; the word “substantial” implies “approximate”, and may be used in patent claims to avoid a strict numerical boundary; upon finding non-infringement a District Court may either hear an invalidity counterclaim or dismiss it without prejudice.

*Liquid Dynamics Corp. v. Vaughan Co.*  
69 USPQ2d 1595 (Fed. Cir.)  
Decided January 23, 2004

**I. Background**

U.S. Patent No. 5,458,414 (hereinafter, “the ‘414 patent”) is directed to waste treatment facilities, and in particular, to the long term storage of slurries consisting of liquid and solid waste. When storing slurries on a long term basis in a holding tank, the tank contents are continually mixed to prevent settling. To accomplish this mixing, independent claims 1 and 8 of the ‘414 patent are drawn to a storage tank with multiple nozzles situated throughout the tank, and an intake situated in the middle of the tank. The nozzles and the intake operate to create a desired flow path for slurry in the tank. Claims 1 and 8 both contain four claim limitations that are under dispute. (The opinion contains a copy of the claim with the disputed limitations numbered). Limitations 1, 2, and 3 were added during prosecution.

The predecessor of Liquid Dynamics, Great Lakes Aqua Sales, assigned the ‘414 patent to Liquid Dynamics. Liquid Dynamics brought suit against Vaughn Co. in the U.S. District Court for the Northern District of Illinois alleging that 47 of Vaughn’s custom systems infringed the ‘414 patent. Vaughn moved for summary judgment on the grounds of non-infringement, invalidity, and inequitable conduct. In particular, Liquid Dynamics claimed that the ‘414 patent was invalid under 35 U.S.C. §§ 102(b), 103, and 112. The claim of inequitable conduct stemmed from allegations that Great Lakes Aqua Sales (the predecessor of Liquid Dynamics) made, sold, and used systems having the characteristics of the ‘414 patent more than one year prior to the ‘414 patent’s filing date.

After a *Markman* hearing, the District Court determined that terms 1 and 4 were clear and needed no interpretation. The District Court, however, was unable to interpret *the helical flow path* described in terms 2 and 3 by reference to the claim language alone. Instead, the District Court considered the written description, the figures, and the prosecution history in interpreting the claims. Based on this claim interpretation, the District Court granted summary judgment in favor of Vaughn for non-infringement and dismissed Vaughn’s counterclaims as moot. Liquid Dynamics appealed the finding of non-infringement claiming that the District Court erred in construing the claims. Vaughn cross-appealed on the dismissal of its invalidity and inequitable conduct counterclaims. The appeal was before Judges Lourie, Gajarsa, and Dyk. Judge Gajarsa delivered the opinion and Judge Lourie filed a dissenting opinion.

**II. Issues**

A. Did the District Court properly construe the disputed claim terms?

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- B. Was summary judgment of non-infringement proper?
  - C. Was the District Court's dismissal of Vaughan's counterclaims proper?

### III. Discussion

- A. No. Vaughan suggested that limitations 2 and 3 require the slurry to travel in a strict helical flow path against the floor and the peripheral wall of the storage tank. Specifically, Vaughan's interpretation (which relied on Figures 5 and 6) suggested that the flow path returns to the tank center after one rotation. Liquid Dynamics, on the other hand, suggested that claim limitations 2 and 3 have a broader definition. That is, Liquid Dynamics suggested that the substantial helical flow path is generally spiral-like and that a perfect helical path is not required. The District Court accepted Vaughan's proposed claim construction because Figures 5 and 6 (as well as their accompanying text) illustrate a strict helical flow path.

The District Court's analysis was erroneous because the language of claim 1 is clear, and its plain meaning is not contradicted by the written description. The plain language of term 2 requires a "substantial helical flow". The word "substantial" is a modifier implying "approximate", rather than "perfect". "Words of approximation, such as 'generally' and 'substantially,' are descriptive terms 'commonly used in patent claims to avoid a strict numerical boundary to the specified parameter.'" *Anchor Wall Systems v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298, 1311 (Fed. Cir. 2003); *see also, Cordis Corp. v. Medtronic AVE, Inc.*, 339 F.3d 1352, 1361 (Fed. Cir. 2003) (interpreting "substantial" as a modifier that does not impose a numeric constraint). Because the plain language of the claim was clear and uncontradicted by the written description or the figures, the District Court should not have relied on the written description, the figures, or the prosecution history to add limitations to the claim.

In other words, claim 1, as properly construed, claims all flow patterns that are generally, though not necessarily perfectly, spiral, and that fill much, though not necessarily all, of the tank's volume. This construction of the claim follows from the words "substantial helical flow" in limitation 2, the directional outline of limitation 3, and the words "substantially volume filling" in limitation 4. As a result of this construction, claim 1 does not require a flow that returns precisely to the center after a single rotation.

- B. No. Since the District Court granted summary judgment of non-infringement by comparing the accused infringing products to improperly construed claims, summary judgment of no literal infringement is improper. However, since limitations 1, 2, and 3 were narrowing amendments added during prosecution, this may prevent Liquid Dynamics from using the doctrine of equivalence to claim any flows that are not substantially helical. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 344 F.3d 1359, 1366. Accordingly, Liquid Dynamics may be able to establish literal infringement of the '414 patent by showing a substantially helical flow path, but it will have to overcome the presumption of surrender to claim any flow other than a substantially helical one.
- C. No. Since the non-infringement summary judgment was reversed, the counterclaims are no longer moot and must be reinstated. However, the District Court improperly relied on *Spectronics Corp. v. H.B. Fuller*, 940 F.2d 631, 637-38 (Fed. Cir. 1991), in mooted Vaughan's invalidity and inequitable conduct claims because it found non-infringement. In *Spectronics*, the Federal Circuit had a policy of mooted invalidity claims following rulings of non-infringement. The Supreme Court rejected this policy in *Cardinal Chemical Co. v. Morton International*, 508 U.S. 83, 95 (1993), holding instead that the Federal Circuit cannot vacate an invalidity judgment if it finds no infringement. A District court faced with an invalidity counterclaim challenging a patent that it concludes was not infringed may either hear the claim or dismiss it without prejudice. *Nystrom v. TREX Co.*, 339 F.3d 1347, 1352 (Fed. Cir. 2003).

**IV. Dissent**

The plain language interpretation of claim 1 requires a perfect helical flow path. Examining limitation 3, the plain language requires that the flow return to the center of the tank. Although the word “one” is not used to specify that the flow returns to the center after one rotation, this is the plain meaning of the claim. Furthermore, the District Court did not err in interpreting the claim in light of the patent specification, including Figures 5 and 6.