

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

---

*Ex parte* SVEN BRUECKNER, HENRY VAN DYKE PARUNAK, and  
JOHN A. SAUTER

---

Appeal 2007-1200  
Application 09/900,251<sup>1</sup>  
Technology Center 1700

---

Decided: July 18, 2007

---

Before LINDA E. HORNER, ANTON W. FETTING, and DAVID B. WALKER,  
*Administrative Patent Judges.*

WALKER, *Administrative Patent Judge.*

DECISION ON APPEAL

---

<sup>1</sup> The application was filed on July 6, 2001 and claims the benefit of provisional application number 60/216,805, filed July 7, 2000. The real party in interest is Environmental Research Institute of Michigan.

Appeal 2007-1200  
Application 09/900,251

### STATEMENT OF THE CASE

Sven Brueckner et al. (“Appellants”) seek our review under 35 U.S.C. § 134 of the Examiner’s final rejection of claims 1-40. We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

### THE INVENTION

Appellants claim a system for coordinating the actions of individual agents situated in an environment with the environment and with one another, and more particularly to a system operating with pheromone robotics. (Specification 1:5-7). Claim 1, reproduced below, is representative of the subject matter on appeal.

1. A system for constraining the movement of a walker in a digital space with respect to some distinguished location in said space, comprising:

a pump software component associated with the distinguished location emitting a digital pheromone to generate a pheromone gradient, said pheromone having a rate of evaporation and a rate of propagation and

a walker software component operating in a grid system within the space and having a pheromone sensing threshold, said walker moving within the space to satisfy a preselected constraint with respect to said pump.

### THE REJECTION

Claims 1-40 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

### ISSUE

The issue before us is whether Appellants have shown that the Examiner erred in rejecting claims 1-40 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. The dispositive issue is whether the Examiner met the initial burden of setting forth a reasonable explanation as to why he believes that the scope of protection provided by claims 1-40 is not adequately enabled by the description of the invention provided in the specification of the application.

Rather than repeat the arguments of Appellants and the Examiner, we make reference to the Brief and the Answer for their respective details. Only those arguments actually made by Appellants have been considered in this decision. Arguments which Appellants could have made but chose not to make in the Brief have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2004). Except as noted in this opinion, Appellants have not presented any substantive arguments directed separately to the patentability of the dependent claims or related claims in each group. In the absence of a separate argument with respect to those claims, they stand or fall with the representative independent claim. *See* 37 C.F.R. § 41.37(c)(1)(vii). *See also In re Young*, 927 F.2d 588, 590, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991).

### FINDINGS OF FACT

We find the following enumerated findings to be supported by at least a preponderance of the evidence. *Ethicon, Inc. v. Quigg*, 849 F.2d 1422, 1427, 7

Appeal 2007-1200  
Application 09/900,251

USPQ2d 1152, 1156 (Fed. Cir. 1988) (explaining the general evidentiary standard for proceedings before the Office).

1. The Specification teaches that “In the preferred embodiment, a ‘pheromone’ is a packet of digital information that includes at a minimum two pieces of information: a type identifier enabling different packets of the same type to be associated with one another, and a strength.” (Specification 2:14-17).
2. The Specification also teaches the factors which drive the pheromone infrastructure:

The internal operation of the pheromone infrastructure aggregates and propagates pheromone deposits by the agents. At the same time, local pheromone concentrations are reduced in strength automatically by the pheromone infrastructure's evaporation mechanism. There are three general parameters specifying a pheromone in the infrastructure: the pheromone's evaporation factor, propagation factor, and threshold. The evaporation factor determines the rate of the decay of the local strength of a pheromone over time. The propagation factor influences the strength with which a pheromone deposit event to a place is propagated to the neighboring places. The threshold is the strength below which the pheromone is ignored by the pheromone infrastructure. The performance of a pheromone-based coordination mechanism in a specific application depends on these three parameters.

(Specification 7:1-11).

3. Pumps deposit pheromones on a hexagonal grid and walkers sense those pheromones to indirectly determine the locations of the pumps:

The present invention details a pheromone-based coordination mechanism of agents on a hexagonal grid. Agents of two species live in places on the grid: pumps and walkers. Pumps regularly deposit pheromones at their current place. Potentially, they are able to move independently over the grid, but in this paper, we consider static pumps only. The walkers seek to occupy the same places as the pumps, but do not perceive them directly or know the purpose of their movements. Walkers are only permitted to sample pheromone concentrations at their current place and their immediate neighbors. They may not even communicate directly among themselves.

(Specification 7:12-19).

4. “A pheromone system embodies two sets of dynamics: those of the pheromones themselves, and those of the walkers, which move in response to the pheromones.” (Specification 7:21-22).
5. The walker chooses its next place to move by first sampling the concentration of pheromones at its location and adjacent locations. “At a relocation moment  $t$  and located at an arbitrary place  $p$ , a walker selects its next location probabilistically from the set  $(C(p))$  of currently available options.” (Specification 9:7-9). The Specification discloses the mathematical relationships of the selection process, which are driven in part by the concentration of pheromones and the relative attraction of the respective locations from which the walker can choose (*See, e.g.* Specification 9:14-24). Flow charts displaying the logic for a variety of

- relocations strategies are shown in Figures 16-19 and described in greater detail in the specification (Specification 28:16 - 30:20; Figs. 16-19).
6. Examples of pheromone concentration for a variety of pump configurations and varying values for pheromone evaporation factor, propagation factor, and threshold are illustrated in the Figures and Specification (Specification 10:24 - 17:8; Figs. 1-10).
  7. The implementation of an agent runtime environment in software including the creation and deposition of pheromones is described in the Specification (Specification 18:18-25:13).

An agent in the inventive agent runtime environment is an instance of a JAVA object that is derived from the general "Agent" class. The state of the agent is represented by the values in the data slots of the agent's object and the activities are specified in its methods. It will be readily apparent to one skilled in the art that the use of JAVA is illustrative rather than definitive of the invention herein described, and that implementations in other computer languages or other computational architectures are also possible and fall within the invention herein claimed.

- (Specification 18:18-24).
8. The software implementation of a pheromone architecture also is described in the Specification (Specification 25:15-28:14).

#### PRINCIPLES OF LAW

The PTO bears the initial burden when rejecting claims for lack of enablement.

Appeal 2007-1200  
Application 09/900,251

When rejecting a claim under the enablement requirement of section 112, the PTO bears an initial burden of setting forth a reasonable explanation as to why it believes that the scope of protection provided by that claim is not adequately enabled by the description of the invention provided in the specification of the application; this includes, of course, providing sufficient reasons for doubting any assertions in the specification as to the scope of enablement. If the PTO meets this burden, the burden then shifts to the applicant to provide suitable proofs indicating that the specification is indeed enabling.

*In re Wright*, 999 F.2d 1557, 1561-62, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993) (citing *In re Marzocchi*, 439 F.2d 220, 223-24, 169 USPQ 367, 369-70 (CCPA 1971)).

It is by now well-established law that the test for compliance with the enablement requirement in the first paragraph of 35 U.S.C. § 112 is whether the disclosure, as filed, is sufficiently complete to enable one of ordinary skill in the art to make and use the claimed invention without undue experimentation. *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988). “Enablement is not precluded by the necessity for some experimentation . . . . However, experimentation needed to practice the invention must not be undue experimentation. The key word is ‘undue,’ not ‘experimentation.’” *In re Wands*, 858 F.2d at 736-737, 8 USPQ2d at 1404.

To evaluate whether a disclosure would require undue experimentation, the Federal Circuit has adopted the following factors to be considered:

Appeal 2007-1200  
Application 09/900,251

- (1) The quantity of experimentation needed to make or use the invention based on the content of the disclosure;
- (2) The amount of direction or guidance presented;
- (3) The existence of working examples;
- (4) The nature of the invention;
- (5) The state of the prior art;
- (6) The relative skill of those in the art;
- (7) The level of predictability in the art; and
- (8) The breadth of the claims.

*In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404. The examiner's analysis must consider all the evidence related to each of these factors, and any conclusion of nonenablement must be based on the evidence as a whole. *Id.*, 8 USPQ2d at 1404.

When the challenged subject matter is a computer program that implements a claimed device or method, enablement is determined from the viewpoint of a skilled programmer using the knowledge and skill with which such a person is charged. The amount of disclosure that will enable practice of an invention that utilizes a computer program may vary according to the nature of the invention, the role of the program in carrying it out, and the complexity of the contemplated programming, all from the viewpoint of the skilled programmer.

*Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 941, 15 USPQ2d 1321, 1329 (Fed. Cir. 1990) (citing *In re Sherwood*, 613 F.2d 809, 817, 204 USPQ 537, 544 (CCPA 1980), *cert. denied*, 450 U.S. 994, 101 S.Ct. 1694, 68 L.Ed.2d 193 (1981)).

Appeal 2007-1200  
Application 09/900,251

As the court observed in *Sherwood*, the writing of a program may require varying degrees of skill:

In general, writing a computer program may be a task requiring the most sublime of the inventive faculty or it may require only the droning use of clerical skill. The difference between the two extremes lies in the creation of mathematical methodology to bridge the gap between the information one starts with ("the input") and the information that is desired ("the output").

*In re Sherwood*, 613 F.2d at 816-17, 204 USPQ at 544; *but see Fonar Corp. v. General Electric Co.*, 107 F.3d 1543 (Fed.Cir.1997) (stating, in the context of a best mode analysis, "normally, writing code for . . . software is within the skill of the art, not requiring undue experimentation, once its functions have been disclosed").

The claimed invention . . . is not in the details of the program writing, but in the apparatus and method whose patentability is based on the claimed combination of components or steps. . . . The possible design of superior software, or whether each programmer would work out the details in the identical way, is not relevant in determining whether the inventor has complied with the enablement requirement.

*Northern Telecom*, 908 F.2d at 941, 15 USPQ2d at 1329.

## ANALYSIS

The Examiner walked through each of the *In re Wands* factors in turn; however, much of his analysis was cursory and based on conclusory statements that particular factors supported a conclusion of nonenablement. The Examiner follows two main lines of reasoning in finding claims 1-40 not to be enabled.

First, the Examiner found that there is a lack of prior art pertaining to the subject matter of the application (Answer 4). He further found that:

the lack of prior art pertaining to the subject matter of the application provides evidence for the lack of predictability in the art. Therefore, since the state of the prior art refers to the level of skill of a person of ordinary skill in the art, the specification as filed lacks sufficient direction or guidance required to meet the enablement requirement (see MPEP § 2164.05(a)).

(Answer 4). As a result, the Examiner found that the Specification fails to fill the gap between the knowledge of one of ordinary skill in the art and the applicants' claimed invention (Answer 4-5). Finally, the Examiner found that

since the applicants specification does not provide adequate direction and guidance in the practicing of the claimed invention, and since the art area is relatively unpredictable and undeveloped, the invention would require an undue amount of experimentation (see MPEP § 2164.06).

(Answer 6).

This first line of reasoning is supported by nothing more than conclusory statements, without supporting analysis. For example, the base finding that there is a lack of prior art is presented in a conclusory statement without any analysis or

Appeal 2007-1200  
Application 09/900,251

comment as to the prior art of record in the case (Answer 4). In fact, the Appellant filed information disclosure statements dated (1) October 15, 2001 (listing two patents); (2) December 3, 2001 (listing 22 articles totaling more than 500 pages that are also included in the prosecution history); and (3) July 9, 2004 (listing 12 articles). The Examiner does not address why this constitutes a lack of prior art. Since the Examiner's weighing of the *In re Wands* factors relies heavily on his conclusion that there is a lack of prior art—a conclusion which is unsupported by the record—he has failed to set forth a reasonable explanation as to why he believes that the scope of protection provided by the disputed claims is not adequately enabled.

Second, the Examiner found that the nature of the invention is not clear. For example, he found that “the specification does not adequately disclose a specific pump software component, distance software agents, pheromone, walker software component, type of sensor system or control system, which would be correlated and organized to enable each of the elements to form a complete operative system” (Answer 4). The Examiner also found that:

it is unclear as to what kind of control system or sensor system is utilized. The specification provides no guidance or working example as to what constitutes the pump software component recited in the claimed system. How does the distance software component deposit the pheromone? The specification provide[s] no guidance or working example as to what constitutes a pheromone as recited in the claimed system. The specification provide[s] no guidance or working example as to what constitutes a walker software component as recited in the claimed system (see MPEP § 2164.02).

Appeal 2007-1200  
Application 09/900,251

(Answer 5-6). Contrary to the Examiner's findings, the Specification actually provides an enabling description of the claim limitations the Examiner cites as lacking from the Specification (Findings of Fact 1-8).

The Examiner has not set forth a reasonable explanation as to why he believes that the scope of protection provided by claims 1-40 is not adequately enabled by the description of the invention provided in the Specification. He thus failed to meet his burden of setting forth a reasonable explanation of non-enablement. Accordingly, we reverse the enablement rejection of claims 1-40.

#### CONCLUSIONS

We conclude that Appellants have shown that the Examiner erred in rejecting claims 1-40 under 35 U.S.C. § 112, first paragraph.

#### DECISION

The decision of the Examiner to reject claims 1-40 under 35 U.S.C. § 112, first paragraph is reversed.

REVERSED

vsh

Appeal 2007-1200  
Application 09/900,251

GIFFORD, KRASS, SPRINKLE,  
ANDERSON & CITKOWSKI, P.C  
PO BOX 7021  
TROY MI 48007-7021