Paper No. 31

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRIAN H. DANIELSON and DAVID A. DYCHES

Appeal No. 1998-0417
Application No. 08/682,419

ON BRIEF

Before THOMAS, KRASS, and BLANKENSHIP, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1, 6-8 and 13-23, all of the pending claims.

The invention is directed to a computer implemented method and apparatus for determining whether

a polygon is a simple convex polygon. Any of the vertices of the polygon may be chosen as the starting point and, going from vertex to vertex, it is determined whether a change in direction has occurred, relative to a predetermined coordinate axis. The determination is made that the polygon is a simple convex polygon: 1. if the number of direction changes is less than or equal to two if the starting vertex is disposed between two other vertices relative to the predetermined coordinate axis; or 2. if the number of direction changes is equal to one if the starting vertex is not disposed between two other vertices relative to the predetermined coordinate axis.

Representative independent claim 1 is reproduced as follows:

1. A computer implemented method of determining whether a polygon to be displayed in a computer system is a simple convex polygon comprising the steps of:

receiving information defining vertices of the polygon;

determining whether the polygon is convex;

selecting a starting vertex;

determining a direction between a first pair of vertices relative to a predetermined coordinate axis, wherein said first pair of vertices comprises said starting vertex and an adjacent vertex;

for successive pairs of vertices:

determining a direction relative to said predetermined coordinate axis; and

determining whether a change in direction has occurred;

counting the number of changes in direction;

determining a disposition of the starting vertex relative to said predetermined coordinate axis;

determining the polygon is a simple convex polygon in response to the number of direction changes being less than or equal to two if the starting vertex is disposed between two other vertices relative to said predetermined coordinate axis and determining the polygon is a simple convex polygon in response to the number of direction changes being equal to one if the starting vertex is not disposed between two other vertices relative to said predetermined coordinate axis; and

using alternate function means to display the polygon in the computer system in response to the step of determining whether the polygon is a simple convex polygon.

The examiner relies on the following reference:

Beauregard et al. [Beauregard] 4,962,468 Oct. 9, 1990

Claims 1, 6-8 and 13-23 stand rejected under 35 U.S.C. 103 as unpatentable over Beauregard.[1]

Reference is made to the briefs and answer for the respective positions of appellants and the examiner.

[1]While claims 22 and 23 are not included in the examiner's statement of rejection, based on the comments of appellants and the examiner in the briefs and answer, respectively, it is clear that the rejection of these claims is appealed by appellants and that claims 22 and 23 stand rejected under 35 U.S.C. 103 along with the rest of the claims and we will treat them as such.

OPINION

We reverse.

Each of the independent claims requires, in one form or another, that a determination of a simple convex polygon is made in response to the number of direction changes being less than or equal to two if the starting vertex is disposed between two other vertices relative to a predetermined coordinate axis and a determination of a simple convex polygon is made in response to the number of direction changes being equal to one if the starting vertex is not disposed between two other vertices (i.e., the starting vertex is an "extreme" vertex) relative to the predetermined coordinate axis. Independent claim 15 is a bit broader in the sense that the number of direction changes is compared with a first or a second threshold based on a first and a second "disposition" of the starting vertex.

Beauregard is concerned with polygon fill algorithms. In the course of filling the polygons, Beauregard runs tests, including a turning test, a once around test and a once around in the y-direction test. In testing, Beauregard has many of the same concerns as appellants, including direction and changes in direction. However, it appears from the abstract, as well as columns 9-10 of the patent, that Beauregard always starts his determination and polygon fill with the minimum, or lowest, vertex of the polygon.

While the instant invention can begin at any vertex (many of the claims call for "selecting a starting vertex"), this, alone, does not distinguish over Beauregard since the starting vertex selected may be the bottom-most vertex, as in Beauregard. However, by starting always with the bottom vertex, Beauregard fails to teach or suggest the claimed requirements of a determination made by a number of direction changes less than or equal to two "if the starting vertex is disposed between two other vertices" and equal to one "if the starting vertex is not disposed between two other vertices." The starting vertex in Beauregard is always the same one, i.e., the minimum value vertex. The reference does not determine whether a polygon is a simple convex polygon by looking at different numbers of direction changes, or thresholds, depending on the position, or disposition, of the starting vertex.

From the discussion at pages 13-14 of the answer, the examiner appears to be cognizant of this deficiency in Beauregard but concludes the claimed subject matter would have been obvious nevertheless "because Beauregard specifically teaches two direction changes and because artisans...would not read Beauregard as being an absolute teaching but merely one possible method." The trouble with the examiner's reasoning, as we view it, is that Beauregard does not suggest another method and the examiner has pointed to nothing else which would have suggested the modification the examiner seeks to impose on Beauregard.

The examiner's "second reason," set forth in the only full paragraph on page 14 of the answer, sounds suspiciously like a hindsight approach to determining obviousness.

Because the examiner has not adequately addressed how Beauregard is considered to have disclosed or suggested the claimed subject matter wherein a determination of a simple convex polygon is made by looking at different numbers of direction changes, or thresholds, depending on the position, or disposition, of the starting vertex, we hold that the examiner has not established a prima facie case of obviousness.

The examiner's decision rejecting claims 1, 6-8 and 13-23 under 35 U.S.C. 103 is reversed.

REVERSED

JAMES D. THOMAS Administrative Patent Judge	)
ERROL A. KRASS Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
HOWARD B. BLANKENSHIP Administrative Patent Judge	)

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