

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YNJIUN P. WANG and PAUL PAY-LUN JU

Appeal No. 97-0181
Application No. 08/245,613¹

ON BRIEF

Before JERRY SMITH, BARRETT and DIXON, Administrative Patent Judges.
DIXON, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the Examiner's final rejection of claims 2-5, 7-11, 13-16, 18-20 and 22-29, which are all of the claims pending in this application.

We REVERSE.

¹ Application for patent filed May 19, 1994.

BACKGROUND

The appellants' invention relates to a method for recognizing and decoding bar codes using a low resolution image scanner. The method determines the gray level value representative of cell edge crossings subject to an ambiguity as to their order along the axis. The method then resolves the ambiguity to derive the cell edge position and decode the bar code. An understanding of the invention can be derived from a reading of exemplary claim 22, which is reproduced below.

22. A method for detecting the position of a cell represented in a pixel data image, comprising the steps of:

(a) acquiring a pixel data image including a representation of said cell;

(b) determining a pixels-per-cell nominal resolution of said pixel data image;

(c) normalizing the resolution of said pixel data image by one of the following (i) reducing said nominal resolution to a pixels-per-cell target resolution having a selected value, and (ii) if said nominal resolution corresponds to said selected value, stabilizing said nominal resolution at said target resolution;

(d) determining a gray level value for each of a plurality of successive pixels along a first axis, including cell coverage pixels intersected by cell edge crossings, each said cell coverage pixel having a gray level value representing the position of said cell edge crossing subject to an ambiguity as to the order along said first axis of complementary pixel portions of said cell coverage pixel respectively inside and outside the area of said cell in said pixel data image;

(e) utilizing the order and magnitudes of a sequence of said gray level values for a group of successive pixels along said first axis (i) to resolve said ambiguity to determine, for each said cell coverage pixel, the order of its said complementary inside and outside portions along said first axis and (ii) to derive cell edge position data;

(f) deriving cell position data for said cell using step (e) cell edge position data; and

(g) utilizing said cell position data from step (f) to provide a virtual image of said cell.

The prior art references of record relied upon by the Examiner² in rejecting the appealed claims are:

DeForest et al. (DeForest)	4,720,745	Jan. 19, 1988
Longacre, Jr. et al. (Longacre)	5,286,960	Feb. 15, 1994
Klancnik et al. (Klancnik)	5,329,105	Jul. 12, 1994 (Filing date Aug. 10, 1992)
Batterman et al. (Batterman)	5,378,883	Jan. 03, 1995 (Filing date Jul. 19, 1991)

Claims 2-5, 7, 11 and 22-24 stand rejected under 35 U.S.C. § 103 as being unpatentable over Batterman in view of Longacre. Claims 2-5, 7-11 and 22-24 stand rejected under 35 U.S.C. § 103 as being unpatentable over Batterman in view of

² The Examiner has listed Chandler et al. patent (5,296, 690) in the references relied upon, but not applied this reference in the rejection. We base our decision on only those references actually relied upon in the rejections.

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Klancnik. Claims 13-16, 18, 20 and 25 stand rejected under 35 U.S.C. § 103 as being unpatentable over Longacre in view of DeForest. Claim 19 stands rejected under 35 U.S.C. § 103 as being unpatentable over Longacre in view of DeForest further in view of Klancnik. Claims 26-29 stand rejected under 35 U.S.C. § 103 as being unpatentable over Batterman in view of Longacre further in view of DeForest and Klancnik.

Rather than reiterate the conflicting viewpoints advanced by the Examiner and the appellants regarding the above-noted rejections, we make reference to the Examiner's Answer (Paper No. 8, mailed Aug. 7, 1996) for the Examiner's complete reasoning in support of the rejections, and to the appellants' brief (Paper No. 7, filed Jun. 17, 1996) and reply brief (Paper No. 9, filed Oct. 10, 1996) for the appellants' arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by the appellants and the Examiner. As a consequence of our review, we make the determinations which follow.

In our view, the Examiner's analysis is sufficiently reasonable and complete in

that we find that the Examiner has satisfied the burden of presenting a *prima facie* case of obviousness. That is, the Examiner's analysis, if left unrebutted, would be sufficient to support a rejection under 35 U.S.C. § 103. The burden is, therefore, upon appellants to come forward with evidence or arguments which persuasively rebut the Examiner's *prima facie* case of obviousness. Appellants have presented several substantive arguments in response to the Examiner's rejection. Therefore, we consider obviousness based upon the totality of the evidence and the relative persuasiveness of the arguments.

We find that the Examiner has set forth a *prima facie* case of obviousness concerning claim limitations and the motivation for skilled artisans to combine the prior art references applied against the various claims. The appellants have responded to the Examiner's *prima facie* case of obviousness in the reply brief asserting that the individual references and the combination of references do not teach or suggest the resolution of "an ambiguity as to **order of complementary pixel portions.**" (See reply brief at page 2.) Appellants assert that the use of the term "ambiguous" in claim 22 is in accordance with its ordinary dictionary definition where the magnitude value is already determined or known but there is uncertainty as to the two possible orders of the complementary values which total 100 percent of the pixel. (See reply

brief at pages 2 and 6-8.) We agree with appellants concerning the lack of a teaching of Longacre to resolve “ambiguity.” Longacre is concerned with determining the location of the edge of the bar code where there is no ambiguity to be determined/resolved once the location is determined.

The language of claim 22 recites

(d) . . . each said cell coverage pixel having a gray level value representing the position of said cell edge crossing subject to an ambiguity as to the order along said first axis of complementary pixel portions of said cell coverage pixel respectively inside and outside the area of said cell in said pixel data image;

(e) utilizing the order and magnitudes of a sequence of said gray level values for a group of successive pixels along said first axis (i) to resolve said ambiguity to determine, for each said cell coverage pixel, the order of its said complementary inside and outside portions along said first axis and (ii) to derive cell edge position data.

Here, the language of claim 22 requires that the gray level magnitudes are determined and used with their order to resolve the ambiguity and thereby determine the cell edge position. The result of Longacre’s determination of edge position is the same, but is not achieved in the same manner as set forth in the language of claim 22. In summary, we agree with appellants that there is no need for resolution of ambiguity in Longacre after the location of cell edge position is determined. (See reply brief at page 9.)

Appellants argue that the values from the “continuous spatial reflectance function” of Longacre are not gray level values and are “not pixels in the accepted sense of the word.” (See reply brief at pages 4 and 8.) We do not make any determination concerning this argument in view of the sparse description in Longacre and the unknown accuracy of the illustration.

Appellants argue the specific sequence of the steps recited is the language of claim 22 as it relates to the disclosure of Klancnik. (See reply brief at pages 9-12.) We agree with appellants that Klancnik does not teach or suggest the sequence of steps to determine the gray level values and use them to resolve ambiguity as to the location of the cell edge position as set forth in claim 22.

Appellants argue that Klancnik does not teach or suggest low resolution as the Examiner has asserted. (See reply brief at page 12.) We agree with appellants that Klancnik at most teaches low resolution to determine the “quiet zone” and then uses high resolution to determine the actual width of the bar code elements. But we note that the language of claim 22 does not expressly require “low resolution.”

Furthermore, appellants argue that the references do not teach or suggest the language of claim 25 concerning

(a) . . . said cell coverage pixel having a gray level value representing the position of said cell edge crossing subject to an ambiguity as to the order along said axis of complementary pixel portions of said cell coverage pixel

respectively inside and outside of the area of said image cell in said pixel data;

(b) resolving said ambiguity to determine the position of said cell edge crossing along said axis by referring a first sequence of gray level values for a group of successive pixels including said reference pixel to a look up facility, said look up facility responsive to different sequences of gray level values to enable resolution of said ambiguity based on the order and relative magnitudes of gray level values of said first sequence . . .

We agree with appellants. The Examiner merely has found some of the parts of the invention, made a line of reasoning concerning the claimed invention and concluded that the use of a look up table in the claimed invention would have been obvious. We disagree with the Examiner in view of our discussion above with respect to claim 22 concerning the claim limitation directed to resolving the ambiguity based upon the magnitude and the order of the gray level values.

Similarly, Batterman and DeForest do not teach or suggest the claim limitation directed to resolving the ambiguity based upon the magnitude and the order of the gray level values as set forth in independent claims 22, 25 or 29. Therefore, we will not sustain the rejections of claims 2-5, 7, 11 and 22-24 under 35 U.S.C. § 103 as being unpatentable over Batterman in view of Longacre; claims 2-5, 7-11 and 22-24 under 35 U.S.C. § 103 as being unpatentable over Batterman in view of Klancnik; claims 13-16, 18, 20 and 25 under 35 U.S.C. § 103 as being unpatentable over Longacre in view of DeForest; claim 19 under 35 U.S.C. § 103 as being unpatentable over Longacre in

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view of DeForest further in view of Klancnik; and claims 26-29 under 35 U.S.C. § 103 as being unpatentable over Batterman in view of Longacre further in view of DeForest and Klancnik.

CONCLUSION

To summarize, the decision of the Examiner to reject claim 2-5, 7-11, 13-16, 18-20 and 22-29 under 35 U.S.C. § 103 is reversed.

REVERSED

JERRY SMITH)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
LEE E. BARRETT)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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)	
JOSEPH L. DIXON)	
Administrative Patent Judge)	

vsh

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