

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 23

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TAKASHI KANEKO
and MASATO SOME

Appeal No. 1999-2058
Application 08/433,643¹

ON BRIEF

Before JERRY SMITH, BARRETT, and LALL, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

¹ Application for patent filed May 4, 1995, entitled "Image Analyzing Apparatus."

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This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 1, 2, 4, 5, 7, and 10-18.

We affirm-in-part and enter a new ground of rejection.

BACKGROUND

The disclosed invention relates to an image analyzing apparatus which allows a user to select an area of interest within an image and to perform quantitative analysis on the area of interest. In conventional systems, only a density equal to or higher than a predetermined value can be specified, which means that it is impossible to specify a desired image area whose density is higher than the predetermined value (specification, p. 6, lines 3-10). According to the invention, an image area may be specified by setting lower and upper density levels and assigning a predetermined value to image data having a density which falls between these levels (compare Figs. 8 and 9). The image area thus specified may then be quantitatively analyzed.

Claim 1, the sole independent claim, is reproduced below.

1. An image analyzing apparatus for forming images on display means based on image data and effecting quantitative analysis, comprising:

image density lower limit setting means for setting a lower limit value of image density;

image density upper limit setting means for setting an upper limit value of image density;

image area specifying means for specifying image areas having density equal to or higher than the lower

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limit value of image density set by the image density
lower limit setting means and equal to or lower than the
upper limit value of image density set by the image
density upper limit setting means from among the images
displayed on the display means;

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image data storing means for storing image data; and

memory means for two-dimensionally mapping and temporarily storing the image data stored in the image data storing means, wherein the image area specifying means is adapted to data-process the image data within an image data area corresponding to an image area specified thereby and stored in the memory means so that the image area can be displayed on the display means with predetermined density.

The Examiner relies on the following prior art:

1988	Shiraishi et al. (Shiraishi)	4,777,597	October 11,
	Endo et al. (Endo)	5,012,521	April 30, 1991
1993	Poulsen et al. (Poulsen)	5,194,949	March 16,
1995	Echerer et al. (Echerer)	5,384,862	January 24,

Maayan et al. (Maayan), Computer Image Analysis of Kidney Histopathological Sections, Int. J. Bio-Medical Computing, Vol. 10, No. 1, January 1979, pp. 23-28.

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Maayan and Poulsen.

Claims 2, 4, 5, 7, 13, and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Maayan, Poulsen, and Endo.

Claim 10 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Maayan, Poulsen, Endo, and Echerer.

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Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Maayan, Poulsen, and Shiraishi.

Claims 12 and 15-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Maayan, Poulsen, Endo, and Shiraishi.

We refer to the final rejection (Paper No. 12) (pages referred to as "FR__") and the examiner's answer (Paper No. 20) (pages referred to as "EA__") for a complete statement of the Examiner's position, and to the brief (Paper No. 19) (pages referred to as "Br__") and reply brief (Paper No. 21) (pages referred to as "RBr__") for a statement of Appellants' arguments thereagainst.

OPINION

Grouping of claims

Appellants group the claims to stand or fall together as follows (Br4): (1) claims 1, 11, 13, 15, and 17 stand or fall together with claim 1; (2) claims 2, 12, 14, 16, and 18 stand or fall together with claim 2; (3) claims 4 and 7 stand or fall together with claim 4; (4) claim 5 is separately argued; and (5) claim 10 is separately argued.

Means-plus-function limitations

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The claims are apparatus claims drafted in means-plus-function format under 35 U.S.C. § 112, sixth paragraph, where the means "shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." The invention is disclosed in terms of block diagrams (Figs. 2 & 3) and flowcharts (Figs. 4 & 6) rather than specific hardware or circuits. The specification discloses that the various means outside the box 60 in Fig. 3 can be operated by a mouse (specification, p. 22, line 20 to p. 23, line 1). The specification discloses that the means need not necessarily be physical means and that arrangements whereby the functions are accomplished by software fall within the scope of the invention (specification, p. 32, lines 15-19). Thus, only a computer program and mouse are specifically disclosed. Appellants do not argue the § 112, sixth paragraph, claim interpretation and, thus, the issue is waived. See 37 CFR § 1.192(c)(8)(iv) (1998) (brief must specify the errors in a rejection).

Claims 1, 11, 13, 15, and 17

Maayan discloses a computer digital image analysis system. The image to be analyzed is digitized into pixels

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having a grey level value represented by numbers ranging between 0 (black) and 255 (white). Upper and lower thresholds define a "window" whose range determines the grey levels which are taken into account during processing. The lower and upper thresholds are set by two sets of binary switches on the computer console (p. 26), which correspond to the "image density lower limit setting means" and the "image density upper limit setting means." The pixels which exhibit grey levels specified by the window are assigned a predetermined intensity by the program, such as white (255), while other pixels are set to black (0) (p. 25). The intensities are displayed as dots on a storage scope (p. 26), which corresponds to the claimed "display means." It is noted, however, that the claim limitations of "for forming images on display means" (preamble), "for specifying image areas . . . from among the images displayed on the display screen," and "so that the image area can be displayed on the display means with predetermined density" (end of claim 1) are statements of intended use and do not require actual display.

Maayan specifies image areas having a density defined by the window (between the upper and lower image density limits)

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from among the images displayed on the display means. Thus, the computer program in Maayan is an "image area specifying means for specifying image areas having density equal to or higher than the lower limit value of image density set by the image density lower limit setting means and equal to or lower than the upper limit value of image density set by the image density upper limit setting means from among the images displayed on the display means." The assignment of a predetermined intensity, such as white (255), to pixels having gray levels within the window meets the limitation of "the image area specifying means is adapted to data-process the image data within an image data area corresponding to an image area specified thereby and stored in the memory means so that the image area can be displayed on the display means with predetermined intensity," except, possibly, for the limitation about memory, which is discussed infra.

The Examiner finds (FR4), and Appellants agree (Br6), that Maayan fails to teach or suggest the claimed "image area specifying means." We disagree. The Examiner's application of Poulsen to show setting a rectangular box to specify an area of interest for density analysis (quantitative analysis)

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indicates that the Examiner is confused about the claim terminology.

The "image area specifying means" corresponds to the image area specifying section 80 in Appellants' Fig. 3, which receives a signal from image density lower limit setting means 102 setting the lower limit value of image density, a signal from image density upper limit setting means 104 setting the upper limit value of image density, and a density changing signal from density changing means 106 setting a desired density. The image area specifying section 80 data-processes image data stored in the window memory 79 to specify an image by changing the density of areas whose density is between the lower and upper limit values of image density to a predetermined density set by the density changing means 104 (specification, p. 22, lines 6-19; p. 24, line 14 to p. 25, line 10). The image areas thus specified to be of a predetermined density can then be quantitatively analyzed by means not disclosed. The "image area specifying means" has nothing to do with specifying an area to be quantitatively analyzed, which limitation is found in claim 2. Poulsen is relevant to claim 2, but is not needed for the "image area

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specifying means" limitation of claim 1. Maayan specifies image areas having a density defined by the window (between the upper and lower image density limits) from among the images displayed on the display means and assigns a predetermined density to the specified image area. Thus, Maayan discloses the functions of the "image area specifying means" and the program on the computer is the same or equivalent structure.

Appellants argue that "Maayan's grey window is not used as criteria for specifying images from among displayed images, as required in claim 1" (Br6; RBr3). It is argued (RBr3): "[I]n Maayan's method a grey scale window is not used to select image areas from among displayed image areas; rather, in Maayan's method, the grey scale window is used to create a black and white image from grey level pixels."

We disagree. Maayan expressly teaches that the image depicts only points whose grey level value lies between the two thresholds as a predetermined grey level, such as white. This specifies images from among the displayed images so that they can be displayed with predetermined white density, just as shown in Appellants' Fig. 9. The fact that Maayan changes

pixels outside the window range of densities to another predetermined density, black, is not precluded by claim 1. Moreover, it is noted that Appellants' invention changes pixels values outside the window defined by the two thresholds to a predetermined value as shown in Fig. 9. The window thresholds in Maayan can be changed continuously (p. 26) to define various structures: (1) the thresholds for Fig. 2 were chosen "so as to depict the cytoplasma" (p. 26); (2) "[b]y shifting the window values upward only nuclei may be depicted (Fig. 3" (p. 27); and (3) "Figure 4 depicts the scenery which is viewed through a narrow window in the cytoplasma grey level range which outlines the epithelial border" (p. 27). Thus, Maayan's grey window is used to specify particular images from among displayed images. However, we note that the function of "specifying image areas . . . from among the images displayed on the display means" in claim 1 only requires determining areas having a density between upper and lower limit values; it does not require specifying particular images.

Appellants argue that Poulsen does not teach the claimed "image area specifying means" because it does not teach or

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suggest specifying image areas having densities between a lower and upper density value (Br7).

As we have shown, Maayan teaches the claimed "image area specifying means."

The Examiner finds (FR4) that Maayan fails to teach or suggest "image storing means" and "memory means . . . for temporarily storing the image data [to be processed by the image area specifying means]" as claimed. The Examiner finds that Poulsen teaches these features, noting column 4, lines 10-20, and concludes that it would have been obvious to combine Maayan and Poulsen "because storing the image data allows for the data to be processed or called to the display at a later time" (FR5).

Appellants argue that, in Maayan, the grey level window is applied to pixels as they are generated (Br6). We interpret this as arguing that Maayan does not have an "image storing means" and "memory means." Appellants do not address the Examiner's conclusion that it would have been obvious to provide an image storing means and memory means in Maayan in view of Poulsen. Accordingly, Appellants have not attempted

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to show error in the rejection as required by 37 CFR § 1.192(c)(8)(iv).

In any case, we agree with the Examiner that it would have been obvious to provide "image data storing means for storing image data" and "memory means for two-dimensionally mapping and temporarily storing the image data stored in the image data storing means" in Maayan. Maayan itself discloses that it was known to store image data on a disk or magnetic tape ("image data storing means") before processing (p. 24). All processing in a computer inherently must be performed on data in memory, which requires temporarily storing data from the disk or magnetic tape in the computer memory.

Furthermore, Poulsen discloses that it was conventional to store data in hard disk, floppy disk, tape (col. 4, lines 46-47) and such data must be loaded into random access memory to be used by the computer. It would have been obvious to store the image data in Maayan in an image storing means, such as a hard disk, and to transfer it to temporary memory means for processing in view of Maayan and Poulsen.

For the reasons discussed above, we conclude that the combination of Maayan and Poulsen provides sufficient evidence to establish a prima facie case of obviousness, which has not

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been shown to be in error. The rejection of claims 1, 11, 13, 15, and 17 is sustained.

Claims 2, 12, 14, 16, and 18

Claim 2 depends on claim 1 and further recites "image area outline specifying means for specifying an outline of the image area to be quantitatively analyzed" and the image area specifying means specifies an image area having a density between two thresholds in the image contained within the outline.

Appellants argue (Br8):

Neither Maayan, Poulsen et al. or Endo et al. teaches or suggests image area specifying means arranged to specify an image area having a density equal to or higher than the lower limit value of image density and equal to less than the upper limit value of image density respectively set by lower and upper limit setting means, within an outlined image area, as defined in dependent claim 2.

The Examiner finds that Maayan and Poulsen do not show specifying an outline of the image area, but that Endo shows this feature at column 2, lines 3-24, where the electronic pen specifies which pattern will be displayed.

We do not follow the Examiner's reasoning. Endo is directed to converting a manually drawn sketch into a

geometrically defined pattern and has nothing to do with specifying an outline of an image area to be quantitatively analyzed.

Nevertheless, we conclude that the subject matter of claim 2 would have been obvious over Maayan and Poulsen. Poulsen discloses setting the boundaries of an area of interest for density analysis (quantitative analysis) (col. 2, lines 35-39; col. 9, lines 20-29, 49-55). The shape of the area is a rectangular box; however, claim 2 does not preclude the outline of the image area from being rectangular. It would have been obvious to provide the outline specifying means of Poulsen in Maayan to allow the user to concentrate on areas of interest. In the combination of Maayan and Poulsen, the image area specifying means of Maayan would specify image areas within the window ranges of densities and display these specified areas as a predetermined density (e.g., white) over the whole image, that is, both within and outside the specified outline taught by Poulsen. However, claim 2 does not preclude specifying an image area having a density between the upper and lower limit values of image density outside as well as inside the outline specified by the image area outline

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specifying means. In fact, Appellants' figures show specifying the image area within a density range over the whole image, not just within the specified outline 120 (compare Figs. 8 and 9). The rejections of claims 2, 12, 14, 16, and 18 are sustained.

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Claims 4 and 7

Claim 4 depends on claim 2 and further recites limitations which are already found in claim 1. For this reason, we enter a new ground of rejection infra under 35 U.S.C. § 112, fourth paragraph. It appears that when Appellants submitted the amendment (Paper No. 11) on June 9, 1997, to incorporate the subject matter of claim 3 (which contained essentially identical subject matter to claim 4, but which depended from claim 1) into claim 1, Appellants inadvertently forgot to cancel claim 4 which duplicates this subject matter.

The limitations of claim 4 are found in claim 1, which has already been addressed. The rejection of claims 4 and 7 is sustained.

Claim 5

The Examiner finds (FR6) that Endo teaches the feature of claim 5 at column 2, lines 3-24. Appellants argue that the applied prior art does not teach this feature, but does not address the Examiner's reasoning (Br9).

It is Appellants' responsibility to specify the errors in the rejection. 37 CFR § 1.192(c)(8)(iv). General allegations

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that limitations are not present in the combination without addressing the Examiner's reasons do not satisfy this requirement. It is not the Board's function to make Appellants' arguments for them. Because Appellants have not specified the error in the Examiner's rejection, the rejection of claim 5 is sustained pro forma.

Claim 10

Appellants argue that while Echerer discloses magnification, "Echerer et al. does not teach or suggest memory means which includes temporary memory means, selected image data means, synthesized data memory means and window memory means, as required in dependent claim 10" (Br9). The Examiner finds that Poulsen discloses these features (EA8).

The rejection in the final rejection overly simplifies the limitations of claim 10 into three functions (mapping, changing the size of a part of the image, and synthesizing the image data and the graphic data) and does not address the specific claimed structures and functional relationships. We see that the claimed "temporary memory means for two-dimensionally mapping and temporarily storing image data stored in the image data storing means" (corresponding to

block 66 in Fig. 3) reads on the computer random access memory for temporarily storing image data stored in the hard disk taught by Maayan and Poulsen. We further see that Echerer discloses storing enhancements in the bitmap in a separate memory from the original bitmap to preserve the integrity of the original bitmap (col. 5, lines 37-44) which can be construed to be the "selected image data memory means for two-dimensionally mapping and temporarily storing a part of the image data stored in the temporary memory means and enlarged, reduced or unchanged in scale" (corresponding to block 72 in Fig. 3), even though the Examiner points to Poulsen. As an aside, we point out to Appellants that this limitation does not require enlarging and reducing as implied by the arguments; the alternative language only requires one of enlarging, reducing, and being unchanged in scale.

However, the Examiner fails to point out what structure in Poulsen constitutes the "synthesized data memory means" (corresponding to block 77 in Fig. 3) and the "window memory means" (corresponding to block 79 in Fig. 3). Moreover, the Examiner has not shown how Poulsen discloses the claimed functional relationships among the blocks. We conclude that

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the Examiner has failed to establish a prima facie case of obviousness as to claim 10. The rejection of claim 10 is reversed.

NEW GROUND OF REJECTION PURSUANT TO 37 CFR § 1.196(b)

Claims 4, 7, and 10 are rejected under 35 U.S.C. § 112, fourth paragraph, because claim 4 fails to further limit the subject matter of claims 1 and 2. Claim 4 essentially repeats the limitations of claim 1 without adding any further limitations. Claims 7 and 10 fall with claim 4.

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CONCLUSION

The rejections of claims 1, 2, 4, 5, 7, and 11-18 are sustained.

The rejection of claim 10 is reversed.

A new ground of rejection has been entered as to claims 4, 7, and 10 pursuant to 37 CFR § 1.196(b).

In addition to affirming the Examiner's rejection of one or more claims, this decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b) (amended effective Dec. 1, 1997, by final rule notice, 62 Fed. Reg. 53,131, 53,197 (Oct. 10, 1997), 1203 Off. Gaz. Pat. & Trademark Office 63, 122 (Oct. 21, 1997)). 37 CFR § 1.196(b) provides, "A new ground of rejection shall not be considered final for purposes of judicial review."

Regarding any affirmed rejection, 37 CFR § 1.197(b) provides:

(b) Appellant may file a single request for rehearing within two months from the date of the original decision

37 CFR § 1.196(b) also provides that the Appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new

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ground of rejection to avoid termination of proceedings (37 CFR § 1.197(c)) as to the rejected claims:

(1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the application will be remanded to the examiner. . . .

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

Should Appellants elect to prosecute further before the Primary Examiner pursuant to 37 CFR § 1.196(b)(1), in order to preserve the right to seek review under 35 U.S.C. §§ 141 or 145 with respect to the affirmed rejection, the effective date of the affirmance is deferred until conclusion of the prosecution before the Examiner unless, as a mere incident to the limited prosecution, the affirmed rejection is overcome.

If Appellants elect prosecution before the Examiner and this does not result in allowance of the application, abandonment or a second appeal, this case should be returned to the Board of Patent Appeals and Interferences for final action on the affirmed rejection, including any timely request for rehearing thereof.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART | 37 CFR § 1.196(b)

JERRY SMITH)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
LEE E. BARRETT)	APPEALS
Administrative Patent Judge)	AND
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