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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte ANTHONY A. SYRACUSE, DONALD KENT,
and ROY Y. TAYLOR

_____

Appeal No. 96-0882
Application 07/885,217[1]

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ON BRIEF

_____

Before HAIRSTON, MARTIN, and CARMICHAEL, *Administrative Patent Judges*.

CARMICHAEL, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of Claims 1-5 and 12-19, which constitute all the claims remaining in the application.

We affirm in part.

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[1] Application for patent filed May 19, 1992.

Appellants' Claim 1 is reproduced as follows:

> 1. A printer for printing an image on a recording media in a manner suitable for display through a lenticular face plate attached to the media subsequent to the printing, comprising:
>
> a media contained by the printer and having first and second directions of printing;
>
> light beam means for modulating a light beam corresponding to ordered image data received by the printer; and
>
> an aperture intercepting the light beam and restricting a projection area of the light beam onto the media, said aperture and light beam means producing pixels on the media by modulation of the beam and restriction of the projection area, the pixels produced directly on the media having a visible overlap in the first direction and a different visible overlap in the second direction.

The Examiner's Answer lists the following prior art:

Gale et al. (Gale)	4,668,080	May 26, 1987
Saito et al. (Saito)	4,768,043	Aug. 30, 1988
Umeda et al. (Umeda)	4,775,896	Oct. 4, 1988

OPINION

This appeal involves three rejections. First, Claims 1-5 and 12-19 stand rejected under 35 U.S.C. § 102 as anticipated by Gale. Second, Claims 12 and 13 stand rejected under 35 U.S.C.

§ 102 as anticipated by Saito. Third, Claims 13 and 14 stand rejected under 35 U.S.C. § 102 as anticipated by Umeda. We will address the three rejections in that order.

Anticipation by Gale

Claims 1-5 and 12-19 stand rejected under 35 U.S.C. § 102 as anticipated by Gale. Claims 1-5 recite an apparatus for printing an image suitable for display through a lenticular face plate. A lenticular image contains interleaved linear portions (e.g., scan lines) of at least two different images. The angle of viewing through the lenticular face plate determines which image is visible. Claims 12-17 recite a method of printing a depth image, which contains interleaved linear portions of stereoscopically related images. Claims 18-19 recite a depth image apparatus including a lenticular overlay.

According to the examiner, Gale anticipates all of the claims. Examiner’s Answer at 3.

Appellants argue among other things that Gale does not use a lenticular face plate for display of an image and does not disclose a depth image apparatus or any method of printing depth images. Appeal Brief at 13 and 17-18. The examiner dismisses

these arguments as directed to the intended use of Gale's apparatus and not to the positively recited structure.

We agree with Appellants.

Appellants' arguments are based on language appearing in the claim preambles. The question of whether a preamble of intended purpose constitutes a limitation to the claims is to be determined on the facts of each case in view of the claimed invention as a whole. *In re Stencel*, 828 F.2d 751, 754, 4 USPQ2d 1071, 1073 (Fed. Cir. 1987); *Perkin-Elmer Corp. v. Computervision Corp.,* 732 F.2d 888, 896, 221 USPQ 669, 675 (Fed. Cir.), *cert. denied*, 469 U.S. 857, 225 USPQ 792 (1984). Review of the specification as a whole should be made to determine whether the inventors intended such language to represent an additional structural limitation or mere introductory language. *In re Paulsen*, 30 F.3d 1475, 1479, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994).

Upon reviewing the specification as a whole in the present case we conclude that the inventors intended the language in question to represent additional limitations and not mere introductory language. We conclude that the recited apparatus and methods must produce a lenticular or depth image even if they are also capable of producing other types of images.

Gale is directed to using a lenticular face plate in the production of high resolution patterns such as identical pixels in a liquid crystal display. Column 1, lines 1-22. The patterns are not described as, nor are they, suitable for display through a lenticular face plate or as depth images.

Therefore, we will not sustain the rejection.

Anticipation by Saito

Claims 12 and 13 stand rejected under 35 U.S.C. § 102 as anticipated by Saito. Each recited method includes a step of foreshortening a dimension (claim 13) or reducing a "diameter" (claim 12) of a writing dot to limit visible dot overlap. A writing dot is a small spot of light scanned over a recording media to produce pixels on the media.

Although the preamble of each claim recites a method of printing a depth image, appellants do not rely on the preambles to distinguish these claims from Saito or to distinguish claims 13 and 14 from Umeda.

The scope of claim 12 will be addressed first. The broadest reasonable interpretation of "diameter" is "dimension." *See The American Heritage Dictionary of the English Language, New College Edition* 364 (1975 ed.), which gives as one of the definitions of "diameter": "Loosely, the thickness or width of anything." This

interpretation is consistent with appellants' specification, which explains that the size of the writing dot is reduced only in the slow scan direction. This is also the way "diameter" is used in Saito (e.g., col. 2, lines 2-3). As for the term "reducing," the claim does not explain what "reducing" is measured with respect to. As a result, the "reducing" step is broad enough to read on reducing a dimension of the writing dot relative to any other dimension, such as the spacing between pixel centers or the spacing between scanning lines. The claim also does not specify the scanning direction (i.e., fast scan or slow scan) in which limitation of visible dot overlap occurs. Furthermore, because the claim does not require that visible dot overlap be limited throughout recording of the entire image, it is broad enough to read on limiting visible dot overlap during recording of only part of an image, such as part of a single scan line. Also, we do not construe the claim as requiring that the dimension of the writing spot be reduced for the express purpose of limiting visible spot overlap; it is sufficient that the selected dimension of the writing spot inherently limits visible dot overlap. Finally, the phrase "limit visible dot overlap" does not preclude the existence of some visible dot overlap.

Thus, we interpret claim 12's reducing step as satisfied by selecting a writing dot having a dimension that inherently limits visible dot overlap in the slow scan or the fast scan direction.

This interpretation is consistent with the specification. The specification states that prior art writing dot dimensions had been selected to be large enough to provide overlap in both the fast scan and slow scan direction. Specification at 2, lines 9-13 and at 5, line 36 through 6, line 6. Appellants' invention involves selecting a smaller dimension in the slow scan direction in order to limit overlap in that direction. Specification at 6, lines 7-9.

Saito selects writing dot dimensions for which overlap is limited in both. Saito's writing dot has a diameter that results in printed dots that do not overlap each other. Figure 6 shows that none of the printed dots on scan line 50 overlap each other. Thus, the reducing step is disclosed by Saito.

For similar reasons, Claim 13's elongating and foreshortening step is satisfied by Saito.

By holding the writing dot's x dimension to a sufficiently short value and by adjusting the spot dimension in the y direction, Saito employs a rectangular writing dot that is

elongated in a first direction (the y direction) and foreshortened in a second direction (the x direction). Column 2, lines 5-23; Figure 1. The dimension of the resulting pixel in the slow scan (y) direction is the same as the y dimension of the writing dot. Column 5, lines 9-40. The dimension of the resulting pixel in the fast scan (x) direction is determined by the length of time that the writing dot is turned on. Column 6, lines 8-31. Although the resulting pixels therefore will be generally rectangular (e.g., square) with rounded corners, they are shown as circular in Figure 6. As shown on scan line 50 in Figure 6, visible scan dot overlap in the second (x) direction is limited, i.e., avoided. Thus, Saito satisfies the elongating and foreshortening step of claim 13.

Appellants argue that Saito does not teach or suggest a method for limiting visible dot overlap. Appeal Brief at 20. Saito does teach a method that inherently limits visible dot overlap as explained above, whether or not Saito expresses the same reasons as Appellants.

Appellants also argue that Saito’s pixels are not produced directly on the recording media by the laser as recited in claims 12 and 13 because in Saito a drum is charged by a laser to pick up ink for transfer onto a receiver substrate. Appeal Brief at

19. However, we find that the use of Saito's drum satisfies the recited step of scanning the writing dot over a recording media to produce pixels directly on the recording media. Saito scans his writing dot over a recording surface such as an electro-photographic material or a photo sensitive film. Column 3, lines 5-10. This scanning produces pixels directly on the recording surface as recited. Column 3, lines 45-52. Thus, Appellants' description of Saito as having a drum charged to pick up ink for transfer onto a receiver substrate is inaccurate. Moreover, the claims would be satisfied by such a system anyway because it would charge a drum recording surface with pixel data to create a charge pattern of pixels directly on the scanning drum surface.

Appellants also criticize Saito as teaching changing the shape and size of the beam as a function of image content (Br. at 20). However, the claims do not preclude changing the dimension of the writing beam as a function of image content. Even if they did, the claim language would be satisified because the maximum beam diameter, which is independent of image content, produces pixels k4 which do not overlap in the fast scan direction (Fig. 6).

Thus, we sustain the rejection of Claims 12 and 13 under 35 U.S.C. § 102 as anticipated by Saito.

Anticipation by Umeda

Claims 13 and 14 stand rejected under 35 U.S.C. § 102 as anticipated by Umeda.

In Claim 13's method a writing dot is elongated in the first scan direction and foreshortened in the second scan direction. The writing dot is scanned over a recording media producing pixels directly on the recording media. In Claim 14's method the "light beam resolution" is less in the second scan direction than in the first scan direction.

The examiner states that "[t]he elongated dot or pixel generation of Umeda et al. anticipates the method steps." Examiner's Answer at 4.

The examiner does not explain which part of the Umeda disclosure he is relying on. Appellants' discussion of Umeda (Brief at 20-22) suggests they believe he is relying on Figure 9. This figure shows a single pixel formed by plural overlapping scans of a writing dot, which Umeda refers to as a beam spot. Column 7, lines 16-24. Since Umeda's discussion of this figure (col. 7, lines 10-24) fails to state otherwise, we assume that the beam spot used to form the pixel depicted therein is circular in shape. However, Umeda explains that the beam spot can be

reduced (i.e., foreshortened) in the subscanning direction, which also results in elongation in the main scanning direction. Column 7, line 62 through column 8, line 2; column 9, line 68 through column 10, line 4; and column 10, lines 32-34. Thus, Umeda elongates a writing dot in the first scanning direction and foreshortens it in the second scanning direction as recited. This is done for the express purpose of limiting line thickening or modular transfer function error in the subscanning (second) direction. Column 7, lines 49-67; column 10, lines 4-5 and 32-34. Limiting the thickness of the printed dots in the subscanning direction also limits the printed dot overlap shown in Figures 12(c) and (d). Because Umeda's reduction of the writing spot size in the subscanning direction limits visible scan dot overlap in the subscanning direction, Umeda fully anticipates Claim 13.

Furthermore, in connection with the fourth embodiment (Fig. 15), Umeda explains that the spot size can be increased in subscanning direction, thereby resulting in elongation in the main scanning direction. Column 10, lines 51-54. This also satisfies claim 13.

Thus, the rejection of Claim 13 is sustained.

Claim 14 recites a method of printing in which the two scanning directions have different writing dot overlap and different light beam resolution.

In at least six different ways, Umeda discloses two scanning directions with different writing dot overlap. First, Figure 9 shows more writing spot overlap in the subscanning direction in one pixel than in the main scanning direction between pixels. Second, Figure 9 shows less writing dot overlap between pixels in the subscanning direction than in the main scanning direction. Third, Figure 9 shows less writing dot overlap within one pixel in the subscanning direction (about two-thirds overlap) than in the main scanning direction (complete overlap). Fourth, the image in Figure 12(c) has at least three different overlaps: a writing dot overlap that produces the printed dots elongated in the subscanning (vertical) direction; a visible scan line overlap between pixels in the subscanning direction; and a very limited amount of overlap between printed dots in the main scanning (horizontal) direction. Fifth, the image in Figure 12(d) also has those three different overlaps. Sixth, the jitter illustrated in Figure 13(c) introduces overlap in the horizontal direction.

With respect to the requirement for different light beam resolution in the two scanning directions, we interpret the term "light beam resolution" very broadly. The term is not used in the specification or references.

The specification uses "resolution" in a very general sense and in at least four different phrases and meanings. First, the "print resolution" is referred to in the specification as the pixel density. Specification at 2, lines 3-13; at 4, lines 10-13; and at 11, lines 29-31. Second, there is the "resolution of the projected image." Specification at 3, lines 13-21. This appears to be related to a "horizontal" resolution and a "vertical" or "fast scan" resolution. Specification at 4, lines 6-8; and at 8, line 35 through 9, line 9. Third, there is a "resolution or number of steps between pixels." Specification at 10, lines 1-3. Fourth, there is "dual resolution printing." Specification at 10, lines 8-9.

The broadest reasonable interpretation of printing "in a second scan direction at a second light beam resolution less than the first resolution" in Claim 14 encompasses using a light beam writing spot that has a larger dimension in one scan direction than in the other. The lesser dimension in the other direction

permits more pixels per linear inch, and thus greater resolution, than in the one direction.

Umeda satisfies Claim 14 because he uses a light beam writing spot that has a larger dimension in the second scan direction (main scanning direction) than in the first (subscanning direction). Column 7, line 62 through column 8, line 2; column 9, line 68 through column 10, line 4; and column 10, lines 32-34. This is the same direction (the main scanning direction) in which Appellants' pixel has a larger dimension and thus lesser resolution. Specification at 4, lines 6-8.

Thus, we sustain the rejection of Claim 14.

CONCLUSION

The rejection of Claims 1-5 and 12-19 under 35 U.S.C. § 102 as anticipated by Gale is not sustained. The rejection of Claims 12 and 13 under 35 U.S.C. § 102 as anticipated by Saito is sustained. The rejection of Claims 13 and 14 under 35 U.S.C. § 102 as anticipated by Umeda is sustained.

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

KENNETH W. HAIRSTON Administrative Patent Judge	)
JOHN C. MARTIN Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
JAMES T. CARMICHAEL Administrative Patent Judge	)

Appeal No. 96-0882
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