

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOHN R. ANDREWS

Appeal No. 1999-1931
Application No. 08/734,319

ON BRIEF

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

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

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

The invention is directed to improved exposure profiles for laser sources having finite response times. More particularly, in electrophotographic marking machines, problems caused by edge misplacements caused by delays in a laser diode's turn-on and turn-off times are solved by determining whether a pixel being imaged forms a leading or a

trailing edge of a solid section of an image area. If the pixel forms an edge, the laser diode's exposure of that edge is advanced or delayed such that the pixel is properly located. The amount of advancement or delay depends upon the exposure versus time/distance characteristics of the imaging station.

Representative independent claim 8 is reproduced as follows:

8. A method of illuminating a photoreceptor comprised of the steps of:

generating a sequence of timing signal;

producing a sequence of image data bits that represent a composite image comprised of standard image areas and image edges;

sensing the image data bits that represent image edges; and

producing laser light in accordance with the sequence of image data bits, wherein the laser light is produced in synchronization with the timing signals when an image data bit represents a standard image area, and wherein the laser light is produced earlier when an image data bit represents an image edge.

The examiner relies on the following references:

Monma et al. (Monma)	4,928,277	May 22, 1990
Hirota	5,357,353	Oct., 18, 1994
Nye et al. (Nye)	5,570,173	Oct. 29, 1996 (filed Oct. 31, 1994)
Kovacs et al. (Kovacs)	5,646,968	Jul. 08, 1997 (filed Nov. 17, 1995)

Claims 1-8 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner offers Monma, Hirota and Nye with regard to claims 1-4 and 6-8, adding Kovacs with regard to claim 5.

Appeal No. 1999-1931
Application No. 08/734,319

Reference is made to the brief and answer for the respective positions of appellant and the examiner.

OPINION

At the outset, we note that, in accordance with appellant's grouping at page 3 of the brief, all claims will stand or fall together.

It is the examiner's position that Monma discloses the claimed subject matter but for 1. an edge sensor operatively connected to the electronic subsystem for sensing image edges and 2. a developing station, a transfer station and a fuser for transferring the image to a recording medium. The examiner employs Hirota for the teaching of an image forming apparatus having an edge detector for detecting an image edge in the main scanning direction for the purpose of smoothing or emphasizing the edge. Nye is employed for its disclosure of a color printer having a charging unit, a development station, a liquefaction stage and a transfixing station.

The examiner concludes that since all of these references are in the same field of endeavor, it would have been obvious to implement an edge detector as taught by Hirota, and the various processing stations as taught by Nye, in the image recording apparatus of Monma for the purpose of improving image reproduction.

Appellant offers no argument as to the application of Nye for its disclosure of the various processing stations in an electrophotographic printing machine and we take

Appeal No. 1999-1931
Application No. 08/734,319

appellant's silence as an acknowledgment of the existence of these processing stations in such systems.

The issue, then, is the application of *Monma*, together with *Hirota*, in rejecting the instant claims.

The instant claims all require, in one form or another, that the drive signals produced by the laser driver are "produced earlier than said active edges when an image data bit represents an image edge" while the drive signals are produced synchronously with the active edges when an image data bit represents a standard image area. Thus, a laser is turned ON earlier when a solid image is produced so as to more accurately locate the edge placement.

In contrast, *Monma* is concerned with compensating for "laser droop" wherein the amount of light emitted from a laser diode immediately after the laser diode is energized "becomes a few % greater than a desired target amount of light" [column 2, lines 7-8].

Monma does have many of the same elements as set forth in the instant claims, and does recite [column 2, lines 54-64] an object of the invention is

to provide...for driving a laser beam source to energize/de-energize laser oscillation for exposing a subject or original while supplying a bias current of a level lower than a threshold level of the laser beam source to a laser diode, by starting to supply the bias current to the laser diode at a position in front of a leading edge of the subject and behind a trailing

edge of a preceding subject for thereby preventing a reproduced image

Appeal No. 1999-1931
Application No. 08/734,319

of the subject from being fogged in its entirety or losing image edge sharpness.

Appellant argues that Monma addresses a completely different problem than that of the subject invention and that the methods of addressing these different problems are, themselves, completely different [brief-page 4]. In particular, appellant argues that whereas Monma uses a switched bias scheme for laser diodes that corrects for laser droop while avoiding problems that result from using a constant bias level, the instant invention teaches a system in which a laser is turned ON and OFF slightly earlier when a “solid” image is produced so as to more accurately locate the edge placement. Appellant argues that “Monma...do not teach early turn on or early turn off, while the subject invention does not teach a bias level droop improvement. Therefore, adding the edge detector of Hirota to Monma...still does not render the subject invention obvious” [brief-bottom of page 4].

While we do not find appellant’s arguments to be a beacon of clarity with regard to particularly pointing out the differences between the instant claimed invention and that disclosed by Monma, we will, nevertheless, reverse the examiner’s rejections since, in our view, the examiner has not established a prima facie case of obviousness.

While Monma does teach, with regard to a laser diode, an operation earlier than, or in front of, a leading edge of a subject, it is clear, from column 2 of Monma, that

Appeal No. 1999-1931
Application No. 08/734,319

Monma is not turning a laser diode ON and OFF, i.e., providing drive signals from image data bits, as claimed, wherein drive signals are provided earlier than an active edge when an image data bit represents an image edge. Rather, it appears from our review of Monma that the laser diode is already ON but that a bias current is provided to the laser beam source, wherein the bias current is lower than a threshold current. It is this bias current that is supplied to the laser diode at a position in front of a leading edge of the subject and behind a trailing edge of a preceding subject for preventing irregularities in an image. Thus, Monma appears to affect, or limit, the intensity of a laser diode, starting the bias current at a position in front of a leading edge of the subject because, left uncompensated, the amount of light emitted from the laser diode immediately after the laser diode is energized would be a little greater than a desired target amount of light. Thus, the bias current is started to be supplied to the laser diode at a position in front of the leading edge of the subject for compensation purposes, preventing an irregular image. The laser driver does not appear to be producing drive signals (which turn the laser diode ON) earlier than the active edges when an image data bit represents an image edge, as claimed.

Moreover, even the examiner admits that Monma does not disclose an edge sensor, as claimed. It is unclear to us why the artisan would look to Hirota for an edge

Appeal No. 1999-1931
Application No. 08/734,319

sensor to be employed in Monma nor is it clear to us how, exactly, the artisan would apply such an edge sensor in Monma to give Monma's system anything it does not already have.

We note the addition of the Kovacs reference with regard to dependent claim 5 but Kovacs was applied for the teaching of a look-up table connected to a clock and we find nothing in Kovacs that would have provided for the deficiencies noted supra with regard to the primary references.

The examiner's decision rejecting claims 1-8 under 35 U.S.C. § 103 is reversed.

REVERSED

ERROL A. KRASS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
ANITA PELLMAN GROSS)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
)	
HOWARD B. BLANKENSHIP)	
Administrative Patent Judge)	

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Appeal No. 1999-1931
Application No. 08/734,319

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