

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board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. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DANIEL WILDMANN
and CHRISTA BUCHMANN

Appeal No. 2003-0517
Application 08/899,848

ON BRIEF

Before THOMAS, HAIRSTON and BARRETT, Administrative Patent Judges.
THOMAS, Administrative Patent Judge.

DECISION ON APPEAL

Appellants have appealed to the Board from the examiner's final rejection of claims 1-16.

Representative claim 10 is reproduced below:

10. A method for following the common edge of sheet metal blanks before welding the edges together and/or for inspecting the edges or a weld seam formed at the edges after welding, comprising:

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projecting a plurality of lines of light across the edges;

capturing an image of the lines by means of a camera having an adjustable exposure;

evaluating the image, including determining whether the exposure of the camera needs modifying for the next image, and,

when the exposure is determined to need modifying, transmitting a control signal to modify the camera exposure for the next image.

The following references are relied on by the examiner:

Cline et al. (Cline)	4,525,858	June 25, 1985
Tsunefuji et al. (Tsunefuji)	4,529,289	July 16, 1985
Iwai	5,533,146	July 2, 1996

Claims 1-16 stand rejected under 35 U.S.C. § 103. In a first stated rejection, the examiner relies upon Iwai in view of Cline as to claims 1 and 6. To this combination, the examiner adds appellants' admitted prior art as to claims 2-5, 7-9 and 15. Finally, to the initial combination of references, the examiner adds Tsunefuji as to claims 10-14 and 16.

Rather than repeat the positions of the appellants and the examiner, reference is made to the briefs and answer for the respective details thereof.

OPINION

Of the subject matter on appeal in claims 1-16, we sustain only the rejection of claims 10-12 and 16 generally for the reasons set forth by the examiner in the answer as embellished upon here.

At the outset, we note that method independent claim 1 and apparatus independent claim 6 are complementary method and apparatus claims of substantially the same subject matter. For purposes of appeal, the significant limitations to be considered are the fact that a projector projects a plurality of lines of light having different intensities across the edges claimed. In corresponding respective method and apparatus independent claims 10 and 12, the subject matter that is the focus of the appeal is that the camera has an adjustable exposure, whereas the projector more broadly recites than in independent claims 1 and 6 a mere projection of a plurality of lines of light across the edges; in these claims there is no requirement that the plurality of lines of light have different intensities across these edges as recited in claims 1 and 6 on appeal. Similarly, corresponding method and apparatus independent claims 13 and 14 on appeal are somewhat like independent claims 1 and 6 on appeal in that the light source has a controllable light intensity notwithstanding the

fact that the projection is merely of a plurality of lines with no specific requirement that the projected lines of light have different intensities.

In considering the first stated rejection of independent claims 1 and 6 on appeal as being obvious within 35 U.S.C. § 103 over Iwai in view of Cline, we find ourselves in general agreement with the positions set forth by appellants as to these claims in the principal brief on appeal. Notwithstanding the examiner's urging at pages 3, 4, and 7 of the answer that the discussion of Figure 1 at column 2 of Iwai teaches projecting a plurality of lines of light across the edges of the metal sheets 1a, 1b, we agree with appellants' views first expressed at the top of page 8 of the principal brief that the slit beam emitter 5a of Iwai's Figure 1 projects only a single beam of light and not a plurality of lines of light as indicated by the examiner. There is simply shown and taught the projection of a single slit beam of light 8 in Figure 1 at column 2. The examiner, however, is correct in indicating at the bottom of page 3 of the answer that Iwai does not project light of differing intensities from the light source laser 5. As Iwai applies to the critical

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limitations of independent claims 1 and 6 on appeal, Iwai alone does not disclose a device that projects a plurality of lines of light having different intensities.

Of interest here is Iwai's use of a collimator lens 6 associated with the slit beam emitter 5a in Iwai's Figure 1. On the other hand, in Cline, the example 2 discussed beginning at column 10, line 28 with respect to Figures 6 and 7 is significant because it is indicated that object 92 in Figure 7 is illuminated by a collimated light source 93. What is significant about Cline is the initial revelation at column 1 that interferometers are known in the art to project divided beams of light into two or more parts and the additional teaching at column 2 that a branch of interferometry of Moire contouring is known in the art where an object is illuminated through a Ronchi grating consisting of alternative opaque and transparent lines of equal width by a collimated light source to produce an array of shadows on the object. The discussion noted earlier at column 10 with respect to Figures 6 and 7 relies upon this earlier teaching.

What is most significant from the noted teachings of example 2 at column 10 of Cline is that a collimated light source may in fact be processed optically to provide a plurality of projected lines of light. As noted by the examiner at page 7 of the

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answer, the teachings of Cline are significant with respect to the use of collimated light in Iwai since the resulting combination yields an improved projection and evaluation apparatus. It clearly would have been obvious to have combined Cline with the teachings of Iwai because corresponding teachings exist in the Abstract of Cline of the use of so-called fringe patterns (derived in accordance with the paragraph bridging columns 4 and 5 of Cline with respect to prior art interferometric and Moire patterns) because the abstract first reveals that the devices of Cline may be used in testing, in surface characterization and inspection applications, which teachings are buttressed at column 1 of Cline and the examiner-noted teachings at column 3, lines 25-30. The advantages of using the approaches of Cline are the varying reflected light intensities from these so-called fringe patterns may be processed to reveal significant amounts of 2 and 3 dimensional information by the circuitry associated with Figure 10 in Cline beyond that which is taught in the single collimated beam approach of Iwai's inspection apparatus. There are significant teachings as well beginning at column 6 of Cline relative to edge detection which is the particular feature discerned according to the teachings of Iwai.

It is thus apparent to us that the artisan would have considered the teachings and suggestions of Iwai and Cline to be properly combinable within 35 U.S.C. § 103 as we have explained. However, the resulting combination yields only light that is projected along a plurality of lines, but not yielding a projected plurality of lines of light having different intensities as projected as required by independent claims 1 and 6 on appeal. Because the combination of Cline and Iwai does not teach or suggest the projection of different intensities or varying intensities of light, we must reverse the rejection of these independent claims.

It is noted, however, that the resulting combination of Iwai and Cline yields no more than what appellants have already admitted to be in the prior art in the discussion bridging specification pages 1 and 2 as filed. There it is indicated that it was known in the art to project a line pattern of constant intensity transversely across the edges. This state of the art was also indicated at specification page 4, lines 22-24 where it was indicated that it was known to project a number of lines of light transversely across the edges. Appellants' disclosed and claimed contribution in the art is properly reflected in

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independent claims 1 and 6 on appeal of projecting a plurality of lines of light of different intensities across the edges.

We also reverse the examiner's second stated rejection of dependent claims 2-5, 7-9 and 15. If we were to agree with the examiner's view that it would have been obvious to the artisan to have combined appellants' admitted prior art with the teachings and suggestions of Iwai and Cline as just outlined, we not only would have affirmed the rejection of dependent claims 2-5, 7-9 and 15 but also would have indicated the obviousness of the subject matter of their parent independent claims 1 and 6 on appeal.

The examiner's reliance upon the paragraph bridging specification pages 6 and 7 on appeal is misplaced. To the extent this discussion may be an accurate characterization of what the state of the art was, particularly with respect to identifying a known corporation that markets a device capable of projecting a plurality of lines of light having different intensities, we conclude that it would not have been obvious to the artisan on the basis of the information provided us according to the noted portion relied upon by the examiner coupled with the examiner's reasoning to have considered such teachings and suggestions as obvious to combine by the artisan within 35 U.S.C.

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§ 103 to the additional teachings and suggestions of Iwai and Cline. On the basis of their teachings and suggestions alone, there appears to us to have been no reason to have modified the combination of Iwai and Cline resulting from them to use plural lines of light having different light intensities since the combined system would have apparently performed well to have provided a satisfactory basis of determining the brightness of the scattered or reflected radiation from the weld bead. The paragraph bridging specification pages 6 and 7 does not indicate any teachings or suggestions to us that would have lead the artisan to have modified the combined teachings of Iwai and Cline to have used instead a light source projecting a plurality of lines of light having different light intensities.

We turn last to the third stated rejection of claims 10-14 and 16 as being obvious over the combined teachings and suggestions of Iwai and Cline, further in view of Tsunefuji. The rejection of independent claims 13 and 14 must be reversed for two reasons. As noted earlier, the projector of these claims must be capable of having controllable light intensity such that the intensity is modified according to the evaluation of the image of the lines. It is noted at page 9 of the answer that the examiner relies upon Cline to teach this feature. In our

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reversal of independent claims 1 and 6 on appeal, we noted that this reference does not teach a projector having the capability of projecting a plurality of lines of light having different intensities. It is thus also apparent to us from our study of Tsunefuji that it is also incapable of and does not teach a projector having a controllable light intensity and then modifying the intensity of the projector to control it. Thus, the reference to Tsunefuji is not relied upon by the examiner to provide the teachings and suggestions of the requirements of claims 13 and 14 on appeal. As such, the rejection of these claims must be reversed.

On the other hand, we sustain the rejection of claims 10-12 and 16. As noted earlier in this opinion, independent claims 10 and 12 do not require a plurality of lines of light from a projector where the lines of light have different intensities, only the mere projection of a plurality of lines of light across the edges. By implication then from our study of the combined teachings and suggestions of Iwai and Cline, this key feature of independent claims 10 and 12 on appeal is met.

The examiner's limited reliance upon Tsunefuji's teachings and suggestions is well-taken. The teachings and suggestions of the background of the invention at columns 1 and 2 of Tsunefuji

indicate that it was known in the art to use spotwise and average photometric techniques to control the exposure in accordance with the average brightness of the object viewed. As relied upon by the examiner in formulating this rejection, the teachings at column 2, lines 39-48 of Tsunefuji indicate that cameras having automatic exposure control were known in the art. Since the brightness of an object was stated to be one of the exposure factors originally discussed at the bottom of column 1 of Tsunefuji, an automatic exposure control camera relying upon a variation of the exposure period is indicated as a means to control the level of exposure such as to make it constant over variable brightness conditions. The artisan would have well recognized that the exposure period is effected by the shutter speed of the camera. Even though the specific teachings of Tsunefuji relate to a film-type camera rather than a CCD type camera of Iwai's element 10 in Figure 1, the generic or generally known teachings about automatic exposure control relied upon by the examiner and noted at columns 1 and 2 of Tsunefuji would have been obvious to have been incorporated in the processing of the image relative to the exposure times of the CCD camera 10 in Iwai. Thus, we consider that it would have been obvious for the artisan to have combined the teachings of Tsunefuji with those of

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Iwai and Cline for the reasons just indicated. As such, the subject matter of independent claims 10 and 12 would have been unpatentable within 35 U.S.C. § 103.

It is noted that appellants' arguments with respect to this rejection at pages 12-14 of the principal brief on appeal do not argue the patentability of independent claims 10 and 12 on appeal, only the subject matter of dependent claims 11 and 16. Even though we recognize that Tsunefuji is silent with respect to the teaching of the projection of a plurality of lines of light across the edges of an object to be inspected, we have noted earlier that this feature is taught in the combined teachings of Iwai and Cline. Because the examiner-noted teachings at column 2 of Tsunefuji indicate that it was known in the art to have automatic, adjustable exposure mechanisms in cameras, the feature of controlling the shutter speed of the camera in dependent claims 11 and 16 on appeal as recited in the alternative with other features is clearly met according to the teachings relied upon by the examiner as we noted in the previous paragraph.

We are likewise unpersuaded by appellants' arguments in the paragraph bridging pages 13 and 14 of the principal brief on appeal that there is not sufficient suggestion or motivation for the combination of the three references. We do not agree with

appellants' observation that there is no discussion of the problems related to reflectivity of the surface being photographed in the combination. On the other hand, there is a significant discussion related to brightness which is a measure of reflectivity of the surface being photographed and, as explained at columns 1 and 2, brightness is a factor in determining exposure levels or exposure times according to general photographic principles. Additionally, there is no recognition or statement of reflectivity per se in the subject matter recited in claims 10-12 and 16. Finally, if the combination of Iwai and Cline taught a variable exposure camera, the examiner would not have relied upon the additional teachings in Tsunefuji to reject these claims on appeal.

In view of the foregoing, of claims 1-16 on appeal, we have sustained the rejection only of claims 10-12 and 16, and reversed the rejection of claims 1-9 and 13-15. As such, the decision of the examiner is affirmed-in-part.¹

¹ We leave it to the examiner to pursue concerns under the enablement portion of 35 U.S.C. § 112, first paragraph, of the total lack of any structural elements disclosed with which to embody the control units 14, 15 in Figure 2 as well as the evaluation units 16-18 in this figure.

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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

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