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Paper No. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LEONARDUS F. P. WARMERDAM and HENDRIK BOEZEN

Appeal No. 2000-0142
Application No. 08/705,569

ON BRIEF

Before HAIRSTON, BARRY, and BLANKENSHIP, *Administrative Patent Judges*.

BARRY, *Administrative Patent Judge*.

DECISION ON APPEAL

The examiner rejected the appellants' claims 1-10, 14, 15, and 18-22.¹ They appeal therefrom under 35 U.S.C. § 134(a). We affirm-in-part.

¹The appellants reason that claim 17 "is nowhere discussed in the Final Rejection and so it must be allowable on the present record since there is no factual support for any art rejection thereof." (Appeal Br. at 18.) The examiner states, "[t]he statement of the status of the claims in the brief is correct." (Examiner's Answer at 2.)

BACKGROUND

The invention at issue in this appeal relates to a ballast circuit for operating a discharge lamp. A conventional voltage/current converter integrated circuit ("IC"), which is used in such a ballast circuit, includes an external reference resistor connected thereto. An external bridge circuit generates a high-amplitude, high-frequency voltage. A parasitic capacitance couples the voltage as a high-frequency interference signal, which is superimposed on a voltage developed across the reference resistor. Because the reference resistor is part of a current amplifier of the voltage/current converter and is coupled to a current source of the converter, the current amplifier and the current source are mutually interrelated. The interrelation produce a high-frequency interference signal that impedes operation of the IC.

The appellants' ballast circuit includes a differential amplifier. One input of the differential amplifier is connected to a reference voltage; the other input, to a reference resistor. A current generator supplies a first

current to the reference resistor. A current amplifier generates a second current. The input of the current amplifier is connected to the output of the differential amplifier. The differential amplifier is provided with a low-pass filter. The components of the current amplifier, on one hand, and the current generator and reference resistor, on the other hand, are mutually exclusive. The ballast circuit is also provided with a current control circuit coupled to the current amplifier and to the current generator for influencing the first current dependent upon the second current. The mutual exclusivity and the current control circuit ensure that an interference signal present at the second input causes no appreciable interference in the second current.

Claim 18, which is representative for present purposes, follows:

18. A voltage-to-current converter comprising:

a reference resistor,

first means for supplying a first current to the reference resistor,

a differential amplifier having a first input terminal for connection to a source of reference

voltage, a second input terminal coupled to the reference resistor, and an output,

a low-pass filter coupled between the reference resistor and the second input terminal of the differential amplifier,

a current amplifier for deriving a second current and having an input coupled to the output of the differential amplifier, and

second means coupled to the current amplifier and to the first means for controlling the first current dependent upon the second current, and wherein

the reference resistor is independent of and is not a part of the current amplifier.

(Appeal Br. at 22.)

Besides the appellants' admitted prior art ("AAPA"), the prior art applied by the examiner in rejecting the claims follows:

De La Plaza et al. ("De La Plaza") 4,703,249
Oct. 27, 1987

Seki et al. ("Seki") 4,017,749 Apr. 12,
1977.

Claims 1-10, 14, 15, 19, and 20 stand rejected under 35 U.S.C. § 112, ¶ 2, as being indefinite. (Final Rejection at 3.)

Claims 18-20 stand rejected under 35 U.S.C. § 102(b) as

anticipated by De La Plaza. Claims 21 and 22 stand rejected under § 103(a) as obvious over De La Plaza in view of Seki. Claims 1-10, 14, 15, 19, and 20 stand rejected under 35 U.S.C. § 103(a) as obvious over AAPA in view of De La Plaza. (Examiner's Answer at 7.)²

OPINION

After considering the record, we are persuaded that the examiner erred in rejecting claims 1-10, 14, and 19 as indefinite but not in so rejecting claims 15 and 20. We are also persuaded that he did not err in rejecting claims 18 and 19 as anticipated but did in so rejecting claim 20. In addition, we are persuaded that the examiner did not err in rejecting claims 19, 21, and 22 as obvious but did so in rejecting claims 1-10, 14, 15 and 20. Accordingly, we affirm-in-part. We address the following rejections:

- indefiniteness rejections
- anticipation rejection over De La Plaza

²Although the examiner includes a patent to Nagasawa in his "listing of the prior art of record relied upon in the rejection of claims under appeal," (Examiner's Answer at 4), the patent is not applied in the aforementioned grounds of rejection.

- obviousness rejection over De La Plaza and Seki
- obviousness rejection over AAPA and De La Plaza.³

We start with the indefiniteness rejections.

I. Indefiniteness Rejections

Rather than reiterate the arguments of the examiner or appellants *in toto*, we address the three points of contention therebetween. First, the examiner asserts, "[i]n claim 1, the recitation 'first means and the reference resistor comprise mutually separate components from components of the current amplifier' . . . is unclear . . . because it is not understood what the components of the current amplifier are."

(Examiner's Answer at 5.) The appellants argue, "[s]ince the claim is to be interpreted in the light of the specification, it should be apparent that the aforesaid subject matter of claim 1 is in fact clear and definite." (Appeal Br. at 6.)

³Although the appellants argue about the examiner's refusal to enter an amendment submitted after the final rejection, (Appeal Br. at 5-8), such an issue is to be settled by petition to the Director of the U.S. Patent and Trademark Office rather than by appeal to the Board of Patent Appeals and Interferences. See *In re Hengehold*, 440 F.2d 1395, 1403, 169 USPQ 473, 479 (CCPA 1971).

"The test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification. *Orthokinetics Inc., v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986). If the claims read in light of the specification reasonably apprise those skilled in the art of the scope of the invention, Section 112 demands no more. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1385, 231 USPQ 81, 94 (Fed. Cir. 1986)." *Miles Labs., Inc. v. Shandon Inc.*, 997 F.2d 870, 875, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993).

Here, claim 1 specifies in pertinent part the following limitations: "the first means and the reference resistor comprise mutually separate components from components of the current amplifier" For its part, the specification discloses that "[a]ccording to the invention, the current amplifier on the one hand and the means I and the reference resistor on the other hand exclusively comprise mutually separate components, i.e. the current amplifier on the one

hand, and the means I and the reference resistor on the other hand do not have any components in common." (Spec. at 2.) We are persuaded that one skilled in the art would understand that the limitations, when read in light of the specification, require that the components constituting the means I and reference resistor and the components constituting the current amplifier are mutually exclusive.

Second, the examiner asserts, "[i]n claims 19-20, 'the resistance value' . . . lacks antecedent basis." (Examiner's Answer at 5.) The appellants argue, "claims 19 and 20 are *not* indefinite because of this phrase." (Reply Br. at 3.)

"Inherent components of elements recited have antecedent basis in the recitation of the components themselves. For example, the limitation 'the outer surface of said sphere' would not require an antecedent recitation that the sphere has an outer surface." M.P.E.P. § 2173.05(e) (8th ed., Aug. 2001).

Here, claims 19 and 20 specify in pertinent part the following limitations: "the resistance value of the reference resistor." Because a resistor inherently features a resistance value, i.e., a resistance, the limitation "the resistance value of the reference resistor" does not require an antecedent recitation that the reference resistor has a resistance value. Therefore, we reverse the rejection of claims 1-10, 14, and 19 as being indefinite.

Third, the examiner asserts that in claims 15 and 20, "it is not understood what the 'any switching devices' . . . is and how the reference resistor can be independent of the any switching devices." (Examiner's Answer at 5.) He further asserts, "[i]n claim 20, the recitation 'switching periods' on lines 3-4 is vague and indefinite because it is not understood what the 'switching periods' are" (*Id.*) The appellants argue, "[a]pplicants' apparatus does not use a switching device and so the reference resistor must be independent of any switching device present in the voltage-current converter" (Appeal Br. at 7-8.) They further argue, "since the voltage/current converter is devoid of any

switching devices, there are no switching periods in the claimed apparatus, whereby the resistance value of the reference resistor must necessarily be independent of any switching periods (which do not exist)." (Reply Br. at 2.)

The examiner answers, "the recitation 'reference resistor is independent of any switching device present in the voltage current converter' . . . is inconsistent with what is described in the specification and shown in the drawings. For example, the transistor T1 in Figure 2 of the present invention is a switching device and the reference resistor Ref depends on the switching states of the transistor T1."

(Examiner's Answer at 5.)

Claim 15 specifies in pertinent part the following limitations: "the reference resistor is independent of any switching devices present in the voltage-current converter." Similarly, claim 20 specifies in pertinent part the following limitations: "[t]he voltage-to-current converter . . . is devoid of any switching devices whereby the resistance value of the reference resistor is independent of any switching

periods." As aforementioned, the appellants argue that the claimed invention does not use a switching device.

The specification discloses, however, that the invention does include a transistor. Specifically, "[t]he current amplifier in this embodiment is constructed as a source follower comprising field effect transistor T1"

(Spec. at 5.) Furthermore, a transistor is "[a] semiconductor device used, as a rectifier, amplifier **or switch**," The Diagram Group, *Macmillan Visual Desk Reference* § 218 (1993)(emphasis added); a transistor is a "[s]emiconductor used as amplifier **or switching device**." *Id.* at § 342 (emphasis added). Because the appellants argue that the claimed invention does not use a switching device, while the specification discloses that the invention includes a transistor, we are persuaded that one skilled in the art would not understand the bounds of the claims when read in light of the specification. Therefore, we

affirm the rejection of claims 15 and 20 as being indefinite.⁴
We proceed to the anticipation rejection.

II. Anticipation Rejection over De La Plaza

Rather than reiterate the arguments of the appellants or examiner *in toto*, we address the two points of contention therebetween. First, the examiner asserts, "[t]he De La Plaza et al reference discloses in Figure 5 a voltage to current converter circuit comprising a reference resistor (R1), . . . a low pass filter (C3, R2), a current amplifier (M2)" (Examiner's Answer at 6.) The appellants argue, "[n]or is there anything in the De La Plaza et al description that discloses or even suggests that to make reference resistor R1 in Fig. 5 independent of the alleged current amplifier M2

⁴The appellants admit that the limitations of claims 15 and 20 regarding "any switching device" were "added in a prior amendment" (Appeal Br. at 7.) Such an amendment raises the question of whether persons skilled in the art would recognize in the appellants' **original** disclosure a description of the invention as defined by the **amended** claims. Because there is no rejection for lack of written description before us, however, we leave the question to the examiner and appellants.

would help to solve the high-frequency interference problem in the admitted prior art." (Appeal Br. at 16.)

In deciding anticipation, "the first inquiry must be into exactly what the claims define." *In re Wilder*, 429 F.2d 447, 450, 166 USPQ 545, 548 (CCPA 1970). "In the patentability context, claims are to be given their broadest reasonable interpretations. Moreover, limitations are not to be read into the claims from the specification." *In re Van Geuns*, 988 F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993) (citing *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989)).⁵

Here, claim 18 specifies in pertinent part the following limitations: "the reference resistor is independent of and is not a part of the current amplifier." Giving the claim its broadest reasonable interpretation, the limitations require a

⁵ Claims are given such interpretation because during examination an "applicant may then amend his claims, the thought being to reduce the possibility that, after the patent is granted, the claims may be interpreted as giving broader coverage than is justified." *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969).

reference resistor that is independent of and not part of a current amplifier.

"[H]aving ascertained exactly what subject matter is being claimed, the next inquiry must be into whether such subject matter is novel." *Wilder*, 429 F.2d at 450, 166 USPQ at 548. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (citing *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 715, 223 USPQ 1264, 1270 (Fed. Cir. 1984); *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983); *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771, 218 USPQ 781, 789 (Fed. Cir. 1983)).

Here, as aforementioned, the examiner equates De La Plaza's resistor R_1 to a reference resistor and the reference's transistor M_1 to a current amplifier. De La Plaza

discloses that the value of R_1 depends on the equation " $T_1/(C_1 + C_2)$." Col. 6, ll. 7-10. Because the equation for R_1 does not include the value of M_1 , the resistor is independent of the transistor. Figure 5 of the reference, moreover, shows R_1 and M_1 as separate elements. Because De La Plaza's resistor R_1 and transistor M_1 are separate elements, and the value of R_1 does not depend on the value of M_1 , we are persuaded that the applied prior art discloses the limitations of "the reference resistor is independent of and is not a part of the current amplifier."

Second, the examiner asserts, regarding claim 19, "[i]n column 6, lines 45-54, the De La Plaza reference indicates that the time constant of the stabilized current generating circuit of Figure 5 is given by R_2C_3 ." The appellants argue, "[b]ut col. 6, lines 46-48 of this reference clearly states that the product R_2, C_3 is based on the assumption that ' R_1 is much smaller than R_2 '. Therefore, since a particular relationship between the resistors R_1 and R_2 must exist for the product R_2, C_3 to be effective, clearly resistor R_2 is *not independent* of resistor R_1 ." (Reply Br. at 5.)

Turning to the subject matter being claimed, claim 19 specifies in pertinent part the following limitations: "a resistance capacitance (RC) circuit that is substantially independent of the resistance value of the reference resistor." Giving the claim its broadest reasonable interpretation, the limitations do not require that an RC circuit be independent of the reference resistor as implied by the appellants' argument. All that is required is that an RC circuit be **substantially** independent of the reference resistor.

Turning to the anticipation of the subject matter, the passage of De La Plaza cited by the examiner and appellants discloses that the reference's R_2C_3 circuit is substantially independent of its resistor R_1 . Specifically, "in the circuit according to the invention, the integration time constant is **substantially** given by the product R_2C_3 " Col. 6, ll. 45-47 (emphasis added). Although the passage also mentions an "assumption . . . that R_1 is much smaller than R_2 ," *id.* 47-48, the assumption does not defeat the **substantial** independence of

the circuit. Because De La Plaza's integration time constant is substantially given by the product R_2C_3 , we are persuaded that the applied prior art discloses the limitations of "a resistance capacitance (RC) circuit that is substantially independent of the resistance value of the reference resistor." Therefore, we affirm the rejection of claims 18 and 19 as anticipated by De La Plaza.

Turning to claim 20, we recall that a rejection based on prior art should not be grounded on "speculations and assumptions." *In re Steele*, 305 F.2d 859, 862, 134 USPQ 292, 295 (CCPA 1962). "All words in a claim must be considered in judging the patentability of that claim against the prior art. If no reasonably definite meaning can be ascribed to certain terms in the claim, . . . the claim becomes indefinite." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Here, for the reasons we explained in addressing the indefiniteness rejections, our analysis of claim 20 leaves us

in a quandary about what the claim specifies. Speculations and assumptions would be required to decide the meaning of the terms employed in the claim and the scope of the claim. Therefore, we reverse *pro forma* the rejection of claim 20 as anticipated by De La Plaza. We emphasize that our reversal is based on procedure rather than on the merits of the obviousness rejections. The reversal is not to be construed as meaning that we consider the claims to be patentable as presently drawn. We proceed to the first obviousness rejection.

III. Obviousness Rejection over De La Plaza and Seki

Rather than reiterate the arguments of the examiner or appellants *in toto*, we address the point of contention therebetween. The examiner asserts, "[t]he skilled artisan would be motivated to employ the capacitor in the voltage to current converter in the De La Plaza et al reference for the purpose of removing source voltage ripples." (Examiner's Answer at 8.) The appellants argue, "even if Seki et al teaches a shunt capacitor for filtering high-frequency

interferences, as alleged, there is no reason to add a shunt capacitor across reference resistor R_1 of De La Plaza et al absent some recognition or indication in the latter reference that a high-frequency interference problem is present at resistor R_1 ." (Appeal Br. at 17.)

"Obviousness is not to be determined on the basis of purpose alone." *In re Graf*, 343 F.2d 774, 777, 145 USPQ 197, 199 (CCPA 1965). It is sufficient that references suggest doing what an appellant did, although the appellant's particular purpose was different from that of the references. *In re Heck*, 699 F.2d 1331, 1333, 216 USPQ 1038, 1040 (Fed. Cir. 1983)(citing *In re Gershon*, 372 F.2d 535, 539, 152 USPQ 602, 605 (CCPA 1967)).

Here, De La Plaza discloses a "stabilized current generator with single power supply." Tit. More specifically, the single power supply is "a positive power supply V_{DD} ." Col. 4, ll. 61-62. Although the reference shows several embodiments, it also invites "variations . . . which can be

contrived by a person skilled in the art" Col. 7,
ll. 19-20.

For its part, Seki teaches the problem of ripple voltage components included in power supplies. Specifically, "fluctuation of the voltages," col. 2, l. 42, are caused "by the ac ripple component included in the source voltage" *Id.* at ll. 43-44. The latter reference further teaches a solution to the problem. Specifically, "[t]o the interconnection point 1b' is connected a capacitor C_2 for removing the source voltage ripple, which forms a CR filter circuit with the resistor R_1 . This prevents the fluctuation of the voltages at interconnections 1a' and 1b' by the ac ripple component included in the source voltage V_{cc} applied to the source voltage supply terminal 1a." *Id.* at ll. 38-45.

Because De La Plaza's generator includes a power supply, and Seki teaches a problem troubling power supplies and a solution thereto, we are persuaded that the prior art as a

whole would have suggested combining the teachings of the references. Therefore, we affirm the rejection of claims 21 and 22 as obvious over De La Plaza in view of Seki. We proceed to the last obviousness rejection.

IV. Obviousness Rejection over AAPA and De La Plaza

Rather than reiterate the arguments of the examiner of appellants *in toto*, we address the main point of contention therebetween. The examiner asserts, "[t]he skilled artisan would be motivated to replace the voltage-current inverter of the admitted prior art with the stabilized current generating circuit of De La Plaza for the purpose of providing for the ballast circuit a stable output current having a filtering time constant which is easily determined." (Examiner's Answer at 7.) The appellants argue, "[t]here is therefore clearly no apparent reason . . . for any person skilled in the art to modify the admitted prior art by replacing the voltage/current converter present therein with the stabilized current generator of De La Plaza et al." (Appeal Br. at 10.)

"[T]o establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant."

In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1316 (Fed. Cir. 2000)(citing *In re Dance*, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998); *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984)). "[E]vidence of a suggestion, teaching, or motivation to combine may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved" *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)(citing *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996); *Para-Ordinance Mfg. v. SGS Imports Intern., Inc.*, 73 F.3d 1085, 1088, 37 USPQ2d 1237, 1240 (Fed. Cir. 1995)). "The range of sources available, however, does not diminish the requirement for actual evidence. That is, the showing must be

clear and particular. *See, e.g., C.R. Bard*, 157 F.3d at 1352, 48 USPQ2d at 1232. Broad conclusory statements regarding the teaching of multiple references, standing alone, are not 'evidence.'" *Id.*, 50 USPQ2d at 1617(citing *McElmurry v. Arkansas Power & Light Co.*, 995 F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cir. 1993); *In re Sichert*, 566 F.2d 1154, 1164, 196 USPQ 209, 217 (CCPA 1977)).

Here, although De La Plaza discloses a stable output current generator, the examiner fails to show clear and particular evidence of the desirability of using such a generator in the AAPA's ballast circuit. Specifically, there is no evidence that the ballast circuit would benefit from a current generator having a filtering time constant that is easily determined. Because there is no evidence that the ballast circuit of the AAPA would benefit from the substitution of De La Plaza's current generator, we are not persuaded that teachings from the prior art would have suggested combining the teachings of the references.

Therefore, we reverse the rejection of claims 1-10 and 14 as obvious over AAPA in view of De La Plaza.

Turning to claims 15 and 20, for the reasons we explained in addressing the indefiniteness rejections, our analysis leaves us in a quandary about what the claims specify. Speculations and assumptions would be required to decide the meaning of the terms employed in the claim and the scope of the claim. Therefore, we reverse *pro forma* the rejection of claims 15 and 20 as obvious over AAPA in view of De La Plaza.

Turning to claim 19, we recall that "a disclosure that anticipates under Section 102 also renders the claim invalid under Section 103, for 'anticipation is the epitome of obviousness.'" *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983) (quoting *In re Fracalossi*, 681 F.2d 792, 794, 215 USPQ 569, 571 (CCPA 1982)). Obviousness follows *ipso facto*, moreover, from an anticipatory reference. *RCA Corp. v. Applied Digital Data Sys., Inc.*, 730 F.2d 1440, 1446, 221 USPQ 385, 390 (Fed. Cir. 1984).

Here, as aforementioned, we affirmed the rejection of claim 19 as anticipated by De La Plaza. Accordingly, the claim is *ipso facto* obvious over De La Plaza alone or in combination with other references. Any teachings of the AAPA are merely cumulative. Therefore, we affirm the rejection of claim 19 as obvious over AAPA in view of De La Plaza.

CONCLUSION

In summary, the rejection of claims 1-10, 14, and 19 under § 112, ¶ 2 is reversed, while the rejection of claims 15 and 20 thereunder is affirmed. The rejection of claims 18 and 19 under § 102(b) is affirmed, while the rejection of claim 20 thereunder is reversed. The rejection of claims 19, 21, and 22 under § 103(a) is affirmed, while the rejection of claims 1-10, 14, 15, and 20 thereunder is reversed. Our affirmances are based only on the arguments made in the briefs. Arguments not made therein are neither before us nor at issue but are considered waived.

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

AFFIRMED-IN-PART

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