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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* DAVID AMM, BRIAN MICHAEL KING,  
STEVEN P. HOTELLING and MICHAEL B. WITTENBERG<sup>1</sup>

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Appeal 2018-002432  
Application 13/794,492  
Technology Center 3600

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Before JEAN R. HOMERE, CARL W. WHITEHEAD JR. and  
MICHAEL J. STRAUSS, *Administrative Patent Judges*.

WHITEHEAD JR., *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant is appealing the final rejection of claims 1–3, 5–7, 19–29 and 31–34 under 35 U.S.C. § 134(a). Appeal Brief 5. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

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<sup>1</sup> We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies Apple, Inc., as the real party in interest. Appeal Brief 3.

*Introduction*

According to Appellant, the claimed subject matter is directed to “ultrasonic ranging mobile devices, which can find proximate devices using ultrasound so as to communicate and share data between devices.”

Specification ¶ 6.

*Representative Claims*

1. A mobile device comprising:
  - a button configured to perform a function when actuated;
  - an ultrasound transmitter configured to emit a first signal to a proximate device, wherein the button and the ultrasound transmitter are structurally co-located; and
  - an ultrasound receiver configured to receive a separate second signal from the proximate device, wherein the mobile device is configured to determine a range of the proximate device based on a time lapse associated with the second signal.
  
23. A method of finding a range of a proximate device, comprising:
  - transmitting a first ultrasound signal from a mobile device ultrasound transmitter;
  - recording a time of transmission of the first signal;
  - receiving a separate second ultrasound signal from a proximate device at a plurality of ultrasound receivers of the mobile device, the separate second ultrasound signal being received subsequent to transmitting the first signal;

recording times of receipt of the second signal at the plurality of ultrasound receivers; and calculating a range between the mobile device and the proximate device and a relative orientation based on time lapses between the recorded time of transmission of the first signal and the recorded times of receipt of the second signal.

24. A mobile device comprising:

a housing; and

at least one combined ultrasound transmitter and button disposed on an external surface of the housing and configured to transmit an ultrasound signal without an aperture to pass the ultrasound signal.

#### *References*

<b>Name</b>	<b>Reference</b>	<b>Date</b>
Hooley	US 2011/0129101 A1	June 2, 2011
Mason et al.	US 2004/0192353 A1	September 30, 2004
Hotelling	US 2008/0088602 A1	April 17, 2008
Boyle et al.	US 2010/0002777 A1	January 7, 2010
Langereis et al.	US 2011/0003614 A1	January 6, 2011
Megdal et al.	US 2011/0141853 A1	June 16, 2011

#### *Rejections on Appeal<sup>2</sup>*

Claims 24 and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hooley and Hotelling. Final Action 4.

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<sup>2</sup> The 35 U.S.C. § 112 rejections were withdrawn by the Examiner. *See* Answer 3.

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Claims 1–3, 5–7, 19, 22, 26–27, 31–32 and 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Langereis, Hotelling and Boyle. Final Action 4–9.

Claims 20, 21, 28 and 29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Langereis, Hotelling, Boyle and Hooley. Final Action 9–10.

Claim 23 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Langereis, Megdal and Boyle. Final Action 11–12.

Claim 33 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Langereis, Megdal, Boyle and Mason. Final Action 12.

#### ANALYSIS

Rather than reiterate the arguments of Appellant and the Examiner, we refer to the Appeal Brief (filed October 5, 2017), the Reply Brief (filed January 3, 2018), the Final Action (mailed March 28, 2017) and the Answer (mailed November 3, 2017), for the respective details.

*Claims 1–3, 5–7, 19–22, 26–29, 31–34*

The Examiner finds that Langereis<sup>3</sup> discloses the claimed mobile device with the exception that “Langereis does not explicitly teach a separate second signal or a button configured for performing multiple functions . . . or a button and the ultrasound transmitter are structurally co-located.” Final Action 4–5. The Examiner addresses Langereis’ deficiency by finding that “Boyle teaches a separate second signal [¶]0010]” and “Hotelling teaches a multifunctional button capable of performing multiple functions . . . [¶]”

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<sup>3</sup> Langereis Abstract, ¶¶ 58–60, 85 and 86.

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0044; 0093] and a button and the ultrasound transmitter are structurally co-located [¶0058-66].” Final Action 5.

Appellant contends:

Langereis discloses that a device emits an ultrasonic signal that reflects off of a reflective surface and the emitted ultrasonic signal is received back at the device (that emitted the ultrasonic signal). Langereis does not disclose or suggest to “*emit* a first ultrasound signal *to a proximate device*,” “*receive a separate second signal* from the proximate device,” and “determine a range of the proximate device based on a time lapse associated with the *second signal*,” as recited in independent claim 1.

Appeal Brief 13 (*citing* Langereis ¶58).

Upon review of Langereis, we do not find adequate support for the Examiner’s findings. Langereis discloses “the processor [30] can determine the travelling time of the ultrasonic signal 6, 7 between emission and reception by acoustic transducer 4 and thus determine the distance between acoustic transducer 4 and the reflective surface 9” and, from the distances of the amplitudes of the ultrasonic signal 6 and the reflected ultrasonic 7, the processor 30 may draw conclusions about the properties of the reflective surface 9. Langereis ¶60. Langereis discloses that by comparing the predefined threshold voltage of the time lag, the processor 30 “determines whether the electronic device is being held at the head or cheek of the user, which situation corresponds to a normal phone-call or if the electronic device is located at a certain distance from the head or cheek of the user, indicating a hands-free-call situation.” Langereis ¶60. Langereis further discloses:

[S]teps of generating [ ] at least one electric signal in the frequency range of ultrasonic sound, emitting [ ] at least one ultrasonic signal 6 by means of the acoustic transducer; receiving at least one ultrasonic signal 7 by means of the acoustic

transducer; deducing [ ] from the at least one emitted ultrasonic signal and the at least one received ultrasonic signal at least the delay between emission of the emitted ultrasonic signal and reception of the corresponding ultrasonic signal.

Langereis ¶86.

We find that Langereis does not disclose “an ultrasound transmitter configured to emit a first signal to a proximate device” and “an ultrasound receiver configured to receive a separate second signal from the proximate device” as recited in claim 1. As noted above, the Examiner relies upon Boyle, paragraph 10 and Hotelling, paragraphs 44, 58–66 and 93 to cure Langereis’ deficiencies. The Examiner cites to paragraph 10 of Boyle without any specificity to Boyle’s teachings. *See* Final Action 10; *see also* Appeal Brief 12–13. Boyle discloses that mobile devices may be used for “detecting and/or identifying signals that employ streaming processing to generate time-frequency surfaces by sampling a datastream according to a temporal structure” for such applications as radar surveillance, acoustic surveillance, oil and gas exploration, medical imaging, etc.” Boyle Abstract, ¶10. Boyle fails to cure Langereis’ deficiencies.

Appellant contends, “[T]here is no disclosure or suggestion in Hotelling that a fixed function button has a physical structure or form, or ***that a fixed function button is “structurally co-located” with an “ultrasound transmitter,”***” as recited in independent claim 1. Appeal Brief 15. The Examiner finds:

Hotelling reference is a prior art reference written by one of the listed inventors/appellants, and succinctly directed to using mobile devices with surface buttons for various tasks, and having the ability to configure buttons to perform certain tasks. Since the button and the transmitter are co-located in the mobile device, one having ordinary skill in the art could easily program a

particular button to transmit an ultrasound signal that would initiate ranging.

Answer 6.

We find Appellant's argument persuasive and do not agree with the Examiner's findings because they are not substantiated by Hotelling, which fails to disclose an ultrasound transmitter, as recited in claim 1, that addresses the deficiencies of Langereis and Boyle. "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l., Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

Additionally, the Examiner merely cites to multiple paragraphs within the cited prior art without any specificity as to where the Examiner's findings are supported and therefore, a prima facie case of obviousness has not been established in regard to independent claims 1 and 19.<sup>4</sup> *See* Final

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<sup>4</sup> 37 C.F.R. §1.104(c)(2) (In rejecting claims for want of novelty or for obviousness, the examiner must cite the best references at his or her command. When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified.) The procedural burden of establishing a prima facie case is carried when the rejection satisfies 35 U.S.C. § 132, in "notify[ing] the applicant . . . [by] stating the reasons for [its] rejection, or objection or requirement, together with such information and references as may be useful in judging of the propriety of continuing the prosecution of [the] application." 35 U.S.C. § 132. This section "is violated when a rejection is so uninformative that it prevents the applicant from recognizing and seeking to counter the grounds for rejection." *In re Jung* 637 F.3d 1356, 1362 (Fed. Cir. 2011) citing

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Action 2–3. Accordingly, we reverse the Examiner’s obviousness rejection of independent claims 1 and 19, as well as, the obviousness rejections of dependent claims 2, 3, 5–7, 20–22, 26–29 and 31–34.

*Claim 23*

The Examiner finds that Langereis discloses the claimed mobile device with the exception that, “Langereis does not explicitly teach a second device proximate to the first device, . . . at a plurality of ultrasonic receivers of the mobile device . . . subsequent to transmitting the first signal. . . and calculating a . . . relative orientation.” Final Action 11; *see* Footnote 3. The Examiner addresses Langereis’ deficiency by finding that “Boyle teaches a second device proximate to the first device, or wherein the second device includes at least one ultrasound transmitter capable of transmitting the second signal to the first device in response to the first signal from the first device [¶0010]” and “Megdal teaches at a plurality of ultrasonic receivers of the mobile device . . . subsequent to transmitting the first signal . . . and calculating a . . . relative orientation [¶¶0006; 0039; 0054].” Final Action 11.

Appellant contends, “The Office Action acknowledges that Langereis does not disclose or suggest, and the Office Action does not assert that Megdal discloses or suggests ‘receiving a separate second ultrasound signal from a proximate device at a plurality of ultrasound receivers of the mobile device,’ as recited in independent claim 23.” Appeal Brief 21 (*citing* Final Action 11). Appellant also contend, “Since Langereis and Megdal do not disclose receiving ‘a separate second ultrasound signal,’ Langereis and

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*Chester v. Miller*, 906 F.2d 1574, 1578 (Fed. Cir. 1990).

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Megdal cannot disclose or suggest ‘calculating a range between the mobile device and the proximate device . . . based on time lapses between the recorded time of transmission of the first signal and *the recorded times of receipt of the second signal*,’ as recited in independent claim 23.” Appeal Brief 21–22. Appellant contends that Boyle’s disclosure of “bistatic . . . radar” does not cure the deficiencies of Langereis and Megdal. Appellant argues, “the Examiner is clearly reaching a conclusion based solely on the Examiner’s own understanding that is not supported by any concrete evidence in the record (the mere disclosure of ‘bi-static and mono-static radar’ in paragraph [0010] of Boyle does not support the assertion made by the Examiner).” Appeal Brief 22.

As we indicated above with regard to claim 1, commensurate in scope, we find Appellant’s arguments persuasive and we do not agree with the Examiner’s findings that Boyle remedies Langereis’ deficiency by disclosing “receiving a separate second ultrasound signal from a proximate device at a plurality of ultrasound receivers of the mobile device” as required in independent claim 23. We reverse the Examiner’s obviousness rejection of independent claim 23.

#### *Claims 24–25*

Hooley discloses, “The mobile phone 30 incorporates an ultrasonic transducer array 303 acting as both the transmitter and receiver of the directional microphone, or alternatively comprising a transmitting section and a receiving section.” Hooley ¶33. Hooley further discloses, “The transducer array 303 is shown on the front face of the mobile phone 30, where it fits around other components such as a display screen and keyboard.” Hooley ¶33. The Examiner finds that Hooley discloses the claimed mobile device with the exception that, “Hooley does not explicitly

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teach at least one combined ultrasound transmitter and button.” Final Action 4 (*citing* Hooley Figure 3; paragraph 33). The Examiner addresses Hooley’s deficiency by finding that “Hotelling teaches at least one combined ultrasound transmitter and button.” Final Action 4 (*citing* Hotelling ¶¶44, 93).

Appellant contends, “The Office Action only asserts that paragraphs [0044] and [0093] of Hotelling cure these deficiencies of Hooley without providing any explanation as to how the cited paragraphs of Hotelling cure these deficiencies, presumably because the cited paragraphs of Hotelling do not cure these deficiencies.” Appeal Brief 23–24. Appellant further contends:

Paragraph [0044] of Hotelling discloses “soft or fixed function buttons,” and paragraph [0093] of Hotelling discloses “assign functions to various elements of the UI.” With respect to soft buttons, Hotelling further discloses that “main menu that includes soft buttons or icons that, when selected, activate the device functionality associated with the soft button.” Hotelling, ¶84. However, “*soft buttons or icons*” or other “*elements of the UI*” cannot disclose or suggest a “*combined ultrasound transmitter and button*,” as recited in independent claim 26, as the UI elements do not have a physical structure or form.

With respect to fixed function buttons, Hotelling further discloses that “in many cell phones one fixed function button is used for starting a call and another fixed function button is used for ending a call.” Hotelling, ¶45. However, there is no disclosure or suggestion in Hotelling that a fixed function button has a physical structure or form, or that a fixed function button can be part of a “combined ultrasound transmitter and button,” as recited in independent claim 24.

Appeal Brief 24.

The Examiner refers to page 6 of the Answer to address Appellant’s arguments about Hotelling in regard to claim 24, *see* Answer 7, and finds,

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“Hotelling reference is a prior art reference written by one of the listed inventors/appellants, and succinctly directed to using mobile devices with surface buttons for various tasks, and having the ability to configure buttons to perform certain tasks.”

We find Appellant’s argument persuasive and do not agree with the Examiner’s findings because they are not substantiated by Hotelling because Hotelling does not disclose a combined ultrasound transmitter and button, as recited in claim 24, that addresses the deficiencies of Hooley. We reverse the Examiner’s obviousness rejection of independent claim 24, as well as, dependent claim 25.

#### CONCLUSION

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1–3, 5–7, 19, 22, 26, 27, 31, 32, 34	103	Langereis, Hotelling, Boyle		1–3, 5–7, 19, 22, 26, 27, 31, 32, 34
23	103	Langereis, Megdal, Boyle		23
24, 25	103	Hooley, Hotelling		24, 25
33	103	Langereis, Mason, Hotelling, Boyle		33
<b>Overall Outcome</b>				1–3, 5–7, 19–29, 31–34

REVERSED