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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SHAHROOZ SHAHPARNIA

Appeal 2018-006128
Application 14/743,476
Technology Center 2600

Before JENNIFER S. BISK, JOHN A. EVANS,
STEVEN M. AMUNDSON, *Administrative Patent Judges.*

BISK, *Administrative Patent Judge.*

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a) Appellant¹ appeals from the Examiner’s decision to reject claims 1–18, which are all claims pending in the application. Final Act. 3–13. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

¹ We use the word “Appellant” to refer to “Applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Apple Inc. Appeal Br. 3.

BACKGROUND²

Appellant's disclosed embodiments and claimed invention relate to a determining a corrected signal when force is applied to locations not directly aligned with a force sensing element of a touch device. Spec. ¶ 7. Claim 1, reproduced below, is illustrative of the subject matter on appeal:

1. An electronic device comprising:
 - a touch device including one or more force sensors, the force sensors including one or more force sensing elements, each of the one or more force sensing elements adapted to provide one or more signals with respect to a force applied to the touch device; and
 - one or more processors having access to the one or more signals, the one or more processors adapted to determine a corrected signal for at least one of the one or more signals when a force is applied at one or more locations that is not directly aligned with the force sensing elements.

Claims App. 1.

REJECTIONS

Claims 1–3, 6, 8–12, 14, and 16–18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of US 2007/0113681 A1, published May 24, 2007 (“Nishimura”) and US 2010/0259504 A1, published Oct. 14, 2010 (“Doi”). Final Act. 3–9.

²Throughout this Decision we have considered the Specification filed June 18, 2015 (“Spec.”), the Final Rejection mailed August 18, 2018 (“Final Act.”), the Appeal Brief filed December 18, 2017 (“Appeal Br.”), the Examiner’s Answer mailed March 26, 2018 (“Ans.”), and the Reply Brief filed May 24, 2018 (“Reply Br.”)

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Claims 4, 5, and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Nishimura, Doi, and US 2012/0111119 A1, published May 10, 2012 (“Small”). Final Act. 10–12.

Claims 7 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Nishimura, Doi, and US 2011/0141052 A1, published June 16, 2011 (“Bernstein”). Final Act. 12–13.

ANALYSIS

We have reviewed the § 103 rejections in light of Appellant’s arguments that the Examiner erred. For the reasons explained below, we concur with the Examiner’s conclusions concerning unpatentability under § 103. We adopt the Examiner’s findings and reasoning for the § 103 rejections in the Final Office Action and Answer. *See* Final Act. 3–13; Ans. 12–23. We add the following to address and emphasize specific findings and arguments.

Rejection of Claims 1–18 Under 35 U.S.C. § 103

Appellant makes the same arguments for independent claims 1, 11, and 18. Appeal Br. 8–13; Reply Br. 2–3. Moreover, Appellant does not make separate arguments for dependent claims 2, 4–8, 10, and 13–17. Appeal Br. 13–14. As permitted by 37 C.F.R. § 41.37, we decide the Appeal for the rejection for each of claims 1, 2, 4–8, 10, 11, and 13–18 based on claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv). We discuss claims 3, 9, and 12 separately.

Claim 1

The Examiner relies on Nishimura for most of the limitations of claim 1, but turns to Doi as teaching a portion of “determine a corrected

signal for at least one of the one or more signals when a force is applied at one or more locations that is not directly aligned with the force sensing elements” (“the corrected signal limitation”). Final Act. 4 (citing Doi Abs., Figs. 1, 3–5).

Appellant argues that “Doi does not disclose a touch panel that further comprises ‘one or more force sensing elements adapted to provide one or more signals with respect to a force applied to the touch device,’ [(“the force sensing elements limitation”)] as recited in claim 1.” Appeal Br. 10.

According to Appellant, Doi’s capacitive-based touch panel is not the same as a panel that detects *force*. *Id.* Appellant later argues that Nishimura’s pressure-based touch sensors also do not detect force. *Id.* at 14 (“[E]ach reference only discloses a set of touch sensors (regardless of whether the touch sensors are pressure-based, as described by Nishimura, or capacitive-based, as described by Doi).”).

We agree with the Examiner that the broadest reasonable interpretation³ of the force sensing elements limitation includes the touch sensing elements described by Nishimura and Doi. First, the Specification makes clear that force-sensing elements are sensing the touch of a user. Spec. ¶¶ 33 (“The text ‘force sensing element,’ and variants thereof,

³ During prosecution, claims must be given their broadest reasonable interpretation when reading the claim language in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). Under this standard, we interpret claim terms using “the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant’s specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

generally refers to one or more data elements of any kind, including information sense with respect to force-of-touch, whether at individual locations or otherwise.”), 76 (“When a user’s finger or a stylus covers one force sensing element or less, for example, movement of the user’s finger or the stylus can cause a change in the measurement of applied force.”). Indeed, the Specification states that a touch screen may receive both location and force of touches and the device may be “based on capacitive, resistive, optical, acoustic, inductive, mechanical, chemical, or electromagnetic measurements.” *Id.* ¶ 42; *see also Id.* ¶¶ 52 (stating “touch I/O device 2012 is a touch sensitive and force sensitive display (e.g., touch screen)”), 57 (“Touch I/O device 2012 forms a touch-sensitive and force-sensitive surface that accepts touch input and force-of-touch input from the user.”).

Appellant does not direct us to any evidence that a person of skill in the art would not recognize the pressure-based sensors of Nishimura (Nishimura ¶ 21) or the capacitive-based sensors of Doi (Doi ¶¶ 3–8) as the recited force sensing elements. In fact, Nishimura describes the function of its pressure sensors in terms of force 160, which is applied to the touch device by the user. *See, e.g.,* Nishimura ¶¶ 27 (“In one example, the position-indicating metric used by processor 140 to determine the position of the object on sensor array 120 is the location in the sensor array of the pressure sensor whose pressure signal is greater in level than the pressure signals of the remaining pressure sensors.”), 31 (“FIGS. 0C and 0D show two examples in which pressure is applied to sensor array 120 by applying a force 160 to an area 162 that overlaps several of the pressure sensors of the sensor array.”); *see also* Ans. 18–20 (explaining how Nishimura’s pressure sensors 130 sense force) (citing Nishimura Figs. 2, 5, ¶¶ 22–24, 26–29, and 73). We, therefore, are not persuaded of error in the Examiner’s finding that

the asserted combination of references teaches or suggests the force sensing elements limitation.

Appellant also argues that Doi does not teach the corrected signal limitation. Appeal Br. 10–11. According to Appellant, Doi’s determination of a center position of the touched area “is not a ‘corrected signal’ pertaining to ‘a force applied to [a] touch device,’ but is instead a derived/inferred center position of a touch.” *Id.* at 11. Appellant explains that this determination “does not require correction of any signal provided by an electrode of the touch area, or the correction of any other signal” and “[a]t best, modification of Nishimura’s device to incorporate features of Doi’s device would enable the combined device to determine the center position of a touch that extends off a touch area of the combined device.” *Id.*; *see also* Reply Br. 3 (stating that Nishimura’s determination is “in no way a ‘correction’ of any of the pressure signals” and “Doi’s expression (6) . . . is not a ‘correction’ of any kind of signal”).

Appellant’s arguments do not persuade us the Examiner erred in finding that a combination of Nishimura and Doi teaches the corrected signal limitation. The Examiner points to Nishimura as teaching “processor 140 receiving the one or more pressure signals 132 when a force is applied to the one or more pressure sensors 130 at one or more locations” and applying a “position-indicating metric” to signals 132 to generate an information signal 142, corresponding to the claimed “corrected signal.” Ans. 14–15 (citing Nishimura Figs. 2, 5, ¶¶ 22–24, 26–29, 44, and 73); *see also* Final Act. 4 (citing Nishimura Figs. 0A–2, 6A, 6B, ¶¶ 27–32, 41, and 44–51). The Examiner, however, points to Doi as teaching the “force is applied . . . *that is not directly aligned* with the force sensing elements” portion of the corrected signal limitation. Final Act. 4 (citing Fig. 1, 3–5, Abs.); Ans. 15–17 (citing

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Fig. 1, 3–5 ¶¶ 36, 40–42, 45, and 49). According to the Examiner, “[i]n Doi, a corrected signal determined by expression (6) provides an offset coordinate as the coordinate of a touch, applied force, depending on the amount of misalignment between the touch area and the electrode area 6.” Ans. 16. The Examiner further reasons that it would have been obvious to combine the teachings of Doi regarding misaligned touches with the electronic device taught by Nishimura to improve the accuracy of the user’s input. *Id.* at 17 (citing Doi ¶ 10).

We agree with the Examiner that, although it does not discuss dealing with applied forces that are not directly aligned with the force sensing elements, Nishimura does teach determining signals 142 by processing signals 132 generated by the pressure sensors and processing them in various ways, including using “[a]lgorithms for calculating the location of a center of pressure from a set of pressure signals originating from defined locations.” Nishimura ¶ 29; *see also* ¶¶ 23–32 (describing other methods of processing signals 132). We also agree with the Examiner that Doi discloses using expression (6) to determine position coordinates in the case that the actual touched area extends off the electrode area—i.e. is not directly aligned with the force sensing elements. Doi ¶¶ 48–49. And we agree with the Examiner that these determinations in both Nishimura and Doi are equivalent to the claimed “corrected signal” as recited by claim 1. Although Appellant argues that “deriving/infering the center position of a touch” does not require “correction of any signal,” Appellant does not provide any explanation for why this is so. Appellant does not point to any definition or explanation of how to create a “corrected signal” in the Specification. In fact, the Specification uses the term “corrected signal” only two times

outside the claims and neither use provides any indication of what the term means or how it is created. Spec. ¶¶ 7, 12.

Moreover, determining a new position based on sensor data is consistent with the use of the term “corrected signal” in the Specification. For example, in describing Figure 5B, the Specification states that “[i]n one embodiment, the touch device 2012 can apply an adjustment or *correct* to the total measured signal ‘total *Vsense*’ when the applied force is not aligned with any one force sensing element.” *Id.* ¶ 98; *see also id.* ¶ 104 (“In one embodiment, the touch device 2012 determines a touch location, and for each of the one or more force sensing elements responding to the applied force, determines a correction that is desirable in response to distance from that touch location.”). This language indicates that the broadest reasonable construction of the term “corrected signal” includes signals in which an adjustment to position coordinates has been made. We agree with the Examiner that this includes Nishimura’s processing of signals 132 using various algorithms to generate signals 142 and Doi’s determination of the center position to adjust the position coordinates.

In summary, we agree with the Examiner that modification of Nishimura’s device to incorporate the features of Doi’s device would enable the combined device to determine the center position of a touch that extends off a touch area of the combined device and make such adjustment to the signal generated by the pressure sensors. Under the broadest reasonable interpretation, this teaches the corrected signal limitation.

For these reasons, we agree with the Examiner that a person of skill in the art would understand that claims 1, 2, 6, 8, 10, 11, 14, and 16–18 would have been obvious over the combined disclosures of Nishimura and Doi, claims 4, 5, and 13 would have been obvious over the combined disclosures

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of Nishimura, Doi, and Small, and claims 7 and 15 would have been obvious over the combined disclosures of Nishimura, Doi, and Bernstein.

Claims 3, 9, and 12

Claim 3 depends indirectly from claim 1 and recites “wherein said one or more processors are adapted to determine the one or more locations for the applied force from the one or more touch sensors.” Claims App. 1. The Examiner relies on Nishimura as teaching this limitation. Final Act. 5 (citing Nishimura Figs. 0A–2, 4, 5, ¶¶ 21, 26, 44–47, and 70–73).

Appellant reiterates the arguments that neither reference teaches either the force sensing elements limitation or the corrected signal limitation. Appeal Br. 14. For the reasons discussed above, with respect to claim 1, we are not persuaded of error by these arguments.

Claims 9 and 12 indirectly depend from claims 1 and 11 respectively. Claim 9 recites “wherein the corrected signal comprises a scaled signal,” and claim 12 recites substantively similar language. Claims App. 2. The Examiner relies on Doi as teaching this limitation. Final Act. 6, 7 (citing Doi Figs. 3, 5, ¶¶ 46–49).

Appellant argues “neither Nishimura nor Doi describe ‘a corrected signal’ that ‘comprises a scaled signal.’” Appeal Br. 14. According to Appellant, Doi describes “how to determine the X and Y coordinates of a touched position, but do[es] not describe any sort of scaling operation.” *Id.*

The Examiner argues that the term “scaled signal” includes Doi’s calculation using expressions (2) and (3), which in turn “use conversion ratio 45,” to determine overlap width X46 and overlap width Y47 and expression (6) to “determine the x-coordinate and y-coordinate touch position.” Ans. 22–23 (citing Doi Fig. 3, ¶¶ 41, 42, and 49). The Examiner bases this on a

broad reading of the term “scaled signal” as signals that include proportions between two sets of dimensions. *Id.* at 22.

Appellant does not respond to the Examiner’s claim construction in the Reply Brief. *See* Reply Br. 3 (stating only that the arguments made with respect to claim 1 “generally apply to claims 2–18 as well”). And the Specification does not use the term “scaled signal” outside the claims. Where the Specification uses the term “scaled,” it is consistent with the Examiner’s interpretation of the term. Spec. ¶¶ 111–112. Thus, we are not persuaded of error in the Examiner’s rejection of claims 9 and 12.

For these reasons, we agree with the Examiner that a person of skill in the art would understand that claims 3, 9, and 12 would have been obvious over the combined disclosures of Nishimura and Doi.

DECISION

We affirm the Examiner’s rejection of claims 1–3, 6, 8–12, 14, and 16–18 under 35 U.S.C. § 103 as obvious over the combined teachings of Nishimura and Doi.

We affirm the Examiner’s rejection of claims 4, 5, and 13 under 35 U.S.C. § 103 as obvious over the combined teachings of Nishimura, Doi, and Small.

We affirm the Examiner’s rejection of claims 7 and 15 under 35 U.S.C. § 103 as obvious over the combined teachings of Nishimura, Doi, and Bernstein.

DECISION SUMMARY

Claims Rejected	Basis	Affirmed	Reversed
1–3, 6, 8–12, 14, and 16–18	§ 103 over Nishimura and Doi	1–3, 6, 8–12, 14, and 16–18	
4, 5, and 13	§ 103 over Nishimura, Doi, and Small	4, 5, and 13	
7 and 15	§ 103 over Nishimura, Doi, and Bernstein	7 and 15	
Overall Outcome		1–18	

FINALITY AND RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED