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| Apple c/o Kubota & Basol LLP<br>445 S. Figueroa Street<br>Suite 2140<br>Los Angeles, CA 90071 |             |                      | MARINELLI, PATRICK          |                  |
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* STEVEN P. HOTELLING,  
JOHN GREER ELIAS, and KAPIL VINOD SAKARIYA

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Appeal 2019-004825  
Application 15/380,747  
Technology Center 2600

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Before ERIC B. CHEN, CARL L. SILVERMAN, and  
MICHAEL J. ENGLE, *Administrative Patent Judges*.

ENGLE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant<sup>1</sup> appeals under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1–17, which are all of the claims pending in the application. A telephonic oral hearing was held on June 24, 2020. The record will include a written transcript of the oral hearing. 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 Br. 2.

## TECHNOLOGY

The application relates to “touch sensing devices” in which “multiple drive lines may be simultaneously or nearly simultaneously stimulated with drive signals having unique characteristics, such as phase or frequency.”

Spec. Abstract.

## ILLUSTRATIVE CLAIM

Claim 1 is illustrative and reproduced below with certain limitations at issue emphasized:

1. A touch sensing device comprising:

drive circuitry configured to:

apply a first drive signal to a first drive line of a plurality of drive lines during a first stimulus window; and

apply a second drive signal to a second drive line of the plurality of drive lines during a second stimulus window, *the second stimulus window at least partially overlapping the first stimulus window during an overlapping stimulus window, wherein the first and second drive signals have a predetermined frequency relationship and are in phase during a first portion of the overlapping stimulus window and out of phase during a second portion of the overlapping stimulus window;* and

sense circuitry configured to:

detect a sense signal from at least one sense line, the sense signal being related to the first and second drive signals by touch or proximity of one or more objects to one or more sensing points associated with the at least one sense line, a sensing point being associated with at least one of the plurality of drive lines and at least one of a plurality of sense lines; and

derive touch information for the one or more sensing points from the sense signal.

## REJECTION

Claims 1–17 stand rejected under 35 U.S.C. § 112, first paragraph for lack of written description. Final Act. 3.

## ANALYSIS

Claim 1 recites (A) “a first drive signal . . . during a first stimulus window”; (B) “a second drive signal . . . during a second stimulus window”; (C) “the second stimulus window at least partially overlapping the first stimulus window during an overlapping stimulus window”; and (D) “the first and second drive signals . . . are in phase during a first portion of the overlapping stimulus window and out of phase during a second portion of the overlapping stimulus window.” Independent claim 11 recites commensurate limitations.

The Examiner and Appellant agree that Figures 12B–E of the present application disclose various ways two stimulus windows can overlap and that Figure 8 discloses a specific example of waveforms for first and second drive signals that are in phase during a first portion of a stimulus window and out of phase during a second portion of the stimulus window. *See* Ans. 4–5. The sole dispute is whether a person of ordinary skill in the art would have understood that the phase teachings for the waveforms in Figure 8 apply to the overlapping stimulus windows in Figures 12B–E (as Appellant contends) or alternatively whether Figures 12B–E only apply to waveforms “other” than those in Figure 8 (as the Examiner determines).

An excerpted portion of Figure 8 of the present application is reproduced below:

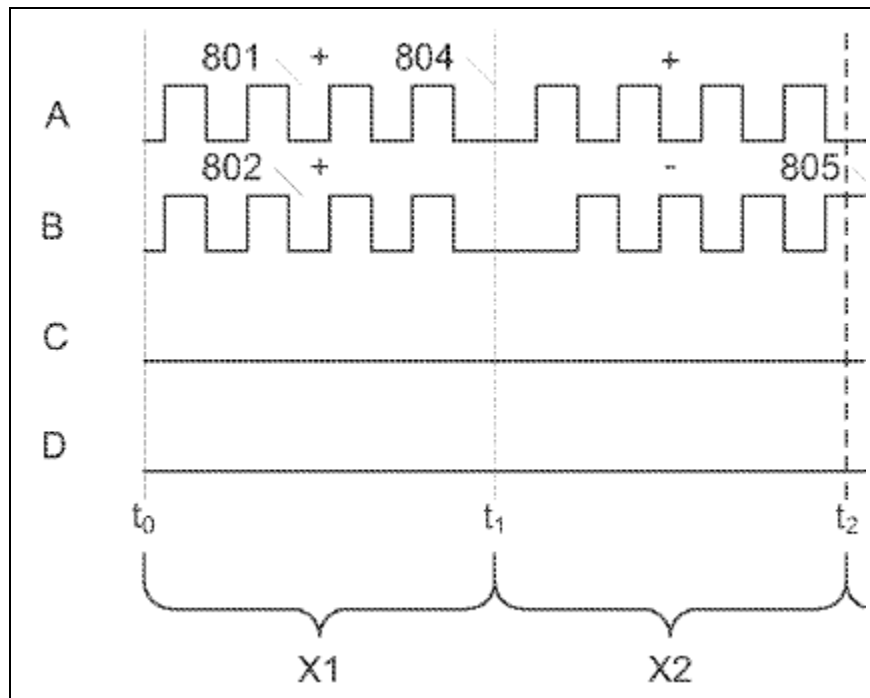
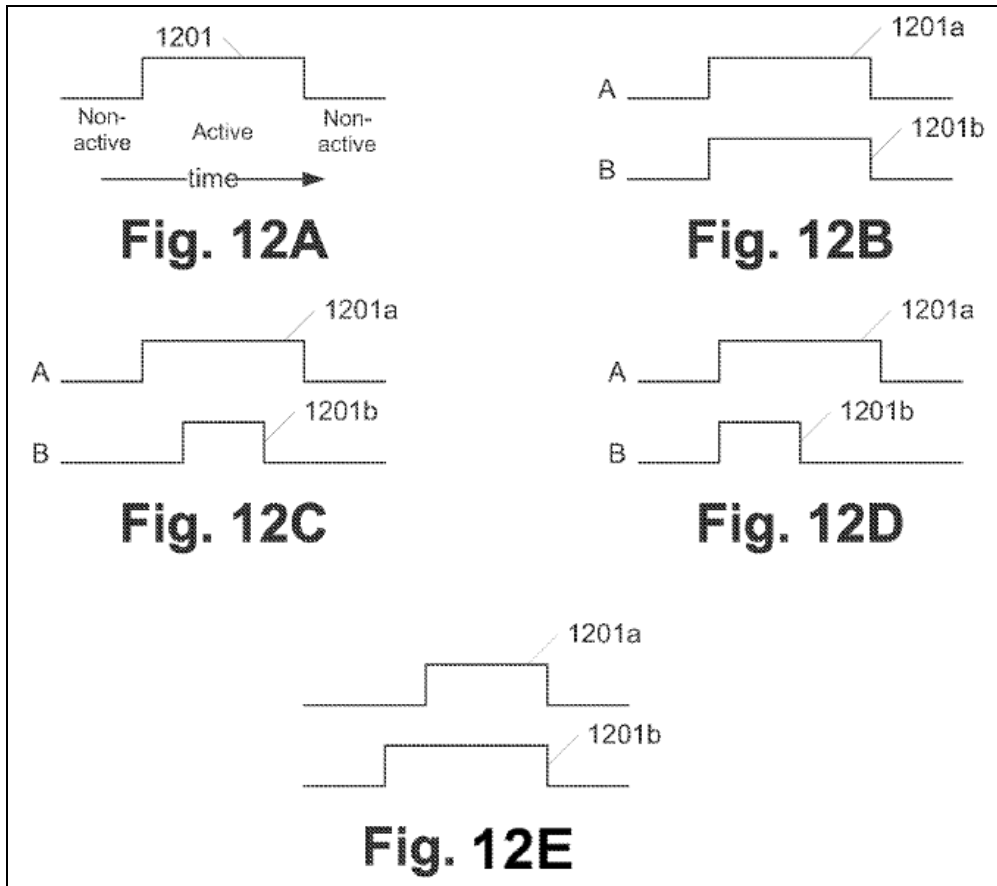


Figure 8 illustrates a multi-line stimulation arrangement in which two lines may be stimulated simultaneously. Specifically, Row A and Row B may be simultaneously (or nearly simultaneously) stimulated with waveforms 801 and 802. As can be seen, the phase of waveform 801 may be adjusted, *e.g.*, after the fourth pulse. As a result, the remaining pulses of waveforms 801 and 802 may be 180° out of phase. . . . The phase relationships between the waveforms may be easily understood with reference to the + and - signs above.

Spec. ¶ 37. Thus, Figure 8 depicts waveforms 801 and 802 as being in phase during time X1 (from  $t_0$  to  $t_1$ ) and out of phase during time X2 (from  $t_1$  to  $t_2$ ).

Figure 12 of the present application is reproduced below:



Figures 12A - E illustrate generally various alternatives for stimulus windows in accordance with an embodiment of the present invention.

Spec. ¶ 19. Elsewhere, the Specification explains Figure 12 as follows:

Examples of *other* possibilities for stimulus waveforms according to the principles described herein may be understood with reference to Fig. 12. Timing signal 1201 can define a stimulus time window. Each line can have a corresponding timing signal. During the stimulus time window, *e.g.*, when signal 1201 is high, a stimulation waveform can be applied to the corresponding line (or lines). This stimulation waveform may take a variety of forms, including a square wave, a sine wave, an exponentially decaying sine wave, a pulsed sine wave, etc.

Spec. ¶ 50 (emphasis added).

The Examiner relies on the word “other” in the first sentence of paragraph 50 to determine that “the stimulus waveforms described with

respect to Figure 12 are described as being *other* stimulus waveforms from those previous[ly] described, such as those in Figure 8.” Ans. 4 (emphasis added). Thus, the Examiner determines that the teachings of Figure 8 do not apply to Figure 12.

For written description, “the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc).

Here, we agree with Appellant that the text describing Figures 8 and 12A–E would have reasonably conveyed the subject matter of claim 1 to a person of ordinary skill in the art. Appeal Br. 11–12. The waveforms of Figure 8 are straightforward examples of the stimulus time windows shown in Figures 12A and 12B. Figures 12C to 12E then are “[e]xamples of other possibilities for stimulus waveforms” that “may be understood with reference to” Figures 12A and 12B. Spec. ¶ 50; Reply Br. 5; *see also* Spec. ¶ 19 (“Figures 12A - E illustrate generally various alternatives for stimulus windows”). As Appellant points out, the first sentence of paragraph 50 also states that its waveforms are “according to the principles described herein,” which includes the teachings surrounding Figure 8. Reply Br. 5; Appeal Br. 11. Figures 12B–E merely depict varying the overlap between “various alternatives for stimulus windows.” Spec. ¶ 19; *see also id.* ¶ 28 (disclosing “at least partially overlapping time periods”). Figure 8 on the other hand depicts varying the phase within a particular waveform. Those teachings are complimentary, not mutually exclusive. Appeal Br. 11–12.

Thus, we do not sustain the Examiner’s rejection of claims 1–17.

Appeal 2019-004825  
Application 15/380,747

DECISION

The following table summarizes the outcome of each rejection:

| <b>Claims Rejected</b> | <b>Statute</b> | <b>Basis</b>        | <b>Affirmed</b> | <b>Reversed</b> |
|------------------------|----------------|---------------------|-----------------|-----------------|
| 1-17                   | § 112          | Written description |                 | 1-17            |

REVERSED