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21 BELL NORTHERN RESEARCH, LLC

22 **IN THE UNITED STATES DISTRICT COURT**
23 **SOUTHERN DISTRICT OF CALIFORNIA**

24 BELL NORTHERN RESEARCH,
25 LLC,
26
27 Plaintiff,
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29 v.
30 HUAWEI DEVICE (DONGGUAN)
31 CO., LTD, HUAWEI DEVICE
32 (SHENZHEN) CO., LTD., and
33 HUAWEI DEVICE USA, INC.,
34
35 Defendants.

C.A. No. 3:18-CV-01784-CAB-BLM
BELL NORTHERN RESEARCH,
LLC'S PATENT L.R. 3.1
DISCLOSURE OF ASSERTED
CLAIMS AND INFRINGEMENT
CONTENTIONS

1 Pursuant to Patent L.R. 3.1 and the Court’s Case Management Order, Plaintiff
2 Bell Northern Research, LLC (“BNR”) hereby provides its Disclosure of Asserted
3 Claims and Infringement Contentions, including the claim charts attached as Exhibits
4 A-H and all Annexes thereto. This disclosure is made solely for the purpose of the
5 above-captioned action, with respect to above-named Defendants.

6 Discovery in this matter is at an early stage and BNR’s investigation of
7 Defendants’ infringement is ongoing. For example, Defendants have not yet produced
8 any documents relating to the accused products; nor have they provided any deposition
9 testimony in this action. This disclosure is therefore based upon information that BNR
10 has been able to obtain publicly, together with BNR’s current good faith beliefs
11 regarding the Accused Instrumentalities in this matter. For example, the figures shown
12 in the accompanying claim charts, including but not limited to those depicting the
13 location of and identifying the presence of claim elements in the Accused
14 Instrumentalities, are illustrative and may change after production and review of
15 Defendants’ confidential information. Accordingly, BNR explicitly reserves the right
16 to amend and/or supplement the accompanying claim charts regarding direct and/or
17 indirect infringement, as well as literal infringement and/or infringement under the
18 doctrine of equivalents based on evidence uncovered in this litigation.

19 The claim charts attached as exhibits hereto are not designed to represent the
20 entire scope of infringement of the Accused Instrumentalities, but are merely to
21 illustrate examples of how the Accused Instrumentalities infringe the Asserted Claims
22 of the Patents-in-Suit. Further, the division of claim elements in the charts attached as
23 exhibits hereto is provided solely for purposes of convenience in presenting BNR’s
24 Infringement Contentions. The division is not meant to modify the claim language or
25 to inform claim construction.

26 The following disclosures should not be construed as BNR’s preliminary
27 construction of any asserted claim or claim term. This disclosure does not represent
28 BNR’s position on whether any claim term should be or needs to be construed,

1 clarified, or interpreted by the Court. Further, these disclosures also are based at least
2 in part on BNR's present understanding of the meaning and scope of the asserted
3 claims of the patents-in-suit in the absence of claim construction proceedings for all
4 the patents-in-suit or substantial discovery in this matter. BNR reserves the right to
5 supplement or amend these disclosures if its understanding of the claim terms changes,
6 including if the Court construes them.

7 This disclosure is given without prejudice to BNR's rights, and BNR hereby
8 expressly reserves its rights under Patent L.R. 3.6(a) or any other applicable basis to
9 further supplement or amend its contentions, including without limitation, to add
10 Asserted Claims or Accused Instrumentalities as additional facts are ascertained,
11 analyses are made, research is completed, contentions are made, claims are construed,
12 and Defendants' confidential information is received and reviewed in discovery.

13 **a. Asserted Claims (Patent L.R. 3.1(a)):**

14 Based on information presently available, BNR asserts that each of the
15 following claims is infringed by Defendants. In accordance with the Court's
16 instructions at the October 22, 2018 Case Management Conference, BNR has limited
17 its assertions to no more than seven claims per patent. BNR expressly reserves the
18 right to modify, substitute, change, or amend which claims it asserts against
19 Defendants as more information becomes available, including without limitation the
20 parties' claim construction positions and the Court's claim construction rulings.

21

U.S. Patent No.	Asserted Claims
7,319,889 ("889 Patent")	1, 2, 4, 5, 6, 8, 12
8,204,554 ("554 Patent")	1, 2, 4, 5, 7, 8, 14
7,990,842 ("842 Patent")	1, 3, 4, 8, 11, 14, 19
6,941,156 ("156 Patent")	1, 2
8,416,862 ("862 Patent")	9, 10, 12
7,957,450 ("450 Patent")	2, 3, 11, 12, 13, 21, 22

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8,792,432 (“432 Patent”)	9, 12
7,039,435 (“435 Patent”)	1, 2, 3, 6, 8

b. Accused Instrumentalities (L.P.R. 3.1(b)):

Based on information presently available, BNR identifies the Accused Instrumentalities below. Defendants infringe the Asserted Claims pursuant to § 271(a) by making, using, importing, selling, and/or offering to sell in the United States without authority these Accused Instrumentalities. The particular acts constituting infringement by Defendants’ accused instrumentalities are detailed in the claim charts attached herewith as Exhibits A - H. BNR reserves the right to amend or add additional Accused Instrumentalities to these Contentions, if warranted and/or based on further investigation and discovery.

Asserted Claim	Accused Instrumentalities
'889 Patent	
1	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
2	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
4	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
5	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
8	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.

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9	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
12	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
'554 Patent	
1	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
2	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
4	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
5	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
7	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
8	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
14	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10, Sensa, Ascend Mate 2, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor 8, Honor View 10.
'842 Patent	
1	Ascend XT ² , Elate, Mate SE, Sensa, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor View 10, MediaPad M3 Lite 10, MediaPad T1 7.0, MediaPad T1 10.0, MediaPad T3 7, MediaPad T3

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	8, MediaPad T3 10, MediaPad M3, MediaPad M3 Lite, MediaPad M5 8.4, MediaPad M5 10.8, MediaPad M5 Pro.
3	Ascend XT ² , Elate, Mate SE, Sensa, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor View 10, MediaPad M3 Lite 10, MediaPad T1 7.0, MediaPad T1 10.0, MediaPad T3 7, MediaPad T3 8, MediaPad T3 10, MediaPad M3, MediaPad M3 Lite, MediaPad M5 8.4, MediaPad M5 10.8, MediaPad M5 Pro.
4	Ascend XT ² , Elate, Mate SE, Sensa, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor View 10, MediaPad M3 Lite 10, MediaPad T1 7.0, MediaPad T1 10.0, MediaPad T3 7, MediaPad T3 8, MediaPad T3 10, MediaPad M3, MediaPad M3 Lite, MediaPad M5 8.4, MediaPad M5 10.8, MediaPad M5 Pro.
8	Ascend XT ² , Elate, Mate SE, Sensa, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor View 10, MediaPad M3 Lite 10, MediaPad T1 7.0, MediaPad T1 10.0, MediaPad T3 7, MediaPad T3 8, MediaPad T3 10, MediaPad M3, MediaPad M3 Lite, MediaPad M5 8.4, MediaPad M5 10.8, MediaPad M5 Pro.
11	Ascend XT ² , Elate, Mate SE, Sensa, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor View 10, MediaPad M3 Lite 10, MediaPad T1 7.0, MediaPad T1 10.0, MediaPad T3 7, MediaPad T3 8, MediaPad T3 10, MediaPad M3, MediaPad M3 Lite, MediaPad M5 8.4, MediaPad M5 10.8, MediaPad M5 Pro.
14	Ascend XT ² , Elate, Mate SE, Sensa, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor View 10, MediaPad M3 Lite 10, MediaPad T1 7.0, MediaPad T1 10.0, MediaPad T3 7, MediaPad T3 8, MediaPad T3 10, MediaPad M3, MediaPad M3 Lite, MediaPad M5 8.4, MediaPad M5 10.8, MediaPad M5 Pro.
19	Ascend XT ² , Elate, Mate SE, Sensa, Pronto, Vision 2, Honor 5X, Honor 6X, Honor 7X, Honor View 10, MediaPad M3 Lite 10, MediaPad T1 7.0, MediaPad T1 10.0, MediaPad T3 7, MediaPad T3 8, MediaPad T3 10, MediaPad M3, MediaPad M3 Lite, MediaPad M5 8.4, MediaPad M5 10.8, MediaPad M5 Pro.
'156 Patent	
1	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10.

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2	Mate 10 Pro, Ascend XT ² , Elate, Mate 9, Mate SE, Porsche Mate 10.
'862 Patent	
9	MediaPad M3 Lite 10, MediaPad M5 8.4, MediaPad M5 10.8, MediaPad M5 Pro.
10	MediaPad M3 Lite 10, MediaPad M5 8.4, MediaPad M5 10.8, MediaPad M5 Pro.
12	MediaPad M3 Lite 10, MediaPad M5 8.4, MediaPad M5 10.8, MediaPad M5 Pro.
'450 Patent	
2	Mediapad M3 Lite 10, Mediapad M5 8.4, Mediapad M5 10.8, Mediapad M5 Pro.
3	Mediapad M3 Lite 10, Mediapad M5 8.4, Mediapad M5 10.8, Mediapad M5 Pro.
11	Mediapad M3 Lite 10, Mediapad M5 8.4, Mediapad M5 10.8, Mediapad M5 Pro.
12	Mediapad M3 Lite 10, Mediapad M5 8.4, Mediapad M5 10.8, Mediapad M5 Pro.
13	Mediapad M3 Lite 10, Mediapad M5 8.4, Mediapad M5 10.8, Mediapad M5 Pro.
21	Mediapad M3 Lite 10, Mediapad M5 8.4, Mediapad M5 10.8, Mediapad M5 Pro.
22	Mediapad M3 Lite 10, Mediapad M5 8.4, Mediapad M5 10.8, Mediapad M5 Pro.
'432 Patent	
9	Mate 10 Pro, Mate 9, Porsche Mate 10, Honor View 10.
12	Mate 10 Pro, Mate 9, Porsche Mate 10, Honor View 10.
'435 Patent	

1	Mate 10 Pro, Elate, Mate SE, Porsche Mate 10.
2	Mate 10 Pro, Elate, Mate SE, Porsche Mate 10.
3	Mate 10 Pro, Elate, Mate SE, Porsche Mate 10.
6	Mate 10 Pro, Elate, Mate SE, Porsche Mate 10.
8	Mate 10 Pro, Elate, Mate SE, Porsche Mate 10.

c. Claim Charts for the Accused Instrumentalities (Patent L.R. 3.1(c)):

U.S. Patent No.	Claim Chart(s)
'889 Patent	<i>See Exhibit A</i>
'554 Patent	<i>See Exhibit B</i>
'842 Patent	<i>See Exhibit C</i>
'156 Patent	<i>See Exhibit D</i>
'862 Patent	<i>See Exhibit E</i>
'450 Patent	<i>See Exhibit F</i>
'432 Patent	<i>See Exhibit G</i>
'435 Patent	<i>See Exhibit H</i>

d. Indirect Infringement (Patent L.R. 3.1(d)):

The Asserted Claims are directly infringed by Defendants' Accused Instrumentalities under 35 U.S.C. § 271(a).

In addition to BNR's direct infringement contentions, BNR further contends that Defendants currently induce and/or have induced their customers to directly infringe the Asserted Claims by using the Accused Instrumentalities in the manner described in Exhibits A-H as instructed by the Defendants or by using the Accused Instrumentalities in the manner programmed by the Defendants.

BNR reserves the right to amend its pleadings and these Contentions to assert additional indirect infringement claims under § 271(b) or (c) and additional theories, if

1 warranted, based on BNR's ongoing investigation and discovery produced by
2 Defendants.

3 **e. Doctrine of Equivalents (Patent L.R. 3.1(e)):**

4 At this time, BNR contends that each element of each Asserted Claim is literally
5 present in each Accused Instrumentality as set forth above and identified in the
6 exhibits and annexes hereto. BNR contends that if any element of the Asserted Claims
7 is found to be not literally present in an Accused Instrumentality, that element is
8 present under the Doctrine of Equivalents. The claim charts attached as exhibits hereto
9 identify illustrative support for where the equivalent feature is found under the doctrine
10 of equivalents pursuant to the function-way-result and/or insubstantial differences
11 tests. BNR reserves the right amend or add to these contentions to identify additional
12 contentions under the Doctrine of Equivalents based on discovery, BNR's
13 investigation, and claim construction.

14 **f. Priority Dates (Patent L.R. 3.1(f)):**

15 BNR contends that each Asserted Claim is entitled to a priority date as indicated
16 below in the chart, based on the date of application of the patent or a parent
17 application. BNR makes this disclosure without waiving any argument that it is
18 entitled to an earlier date of invention based on activities predating the filing of the
19 applications indicated below.

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U.S. Patent No.	Priority Date
'889 Patent claims	At least as early as June 17, 2003
'554 Patent claims	At least as early as June 17, 2003
'842 Patent claims	At least as early as July 27, 2004
'156 Patent claims	At least as early as June 26, 2001
'862 Patent claims	At least as early as April 21, 2005
'450 Patent claims	At least as early as December 14, 2004
'432 Patent claims	At least as early as February 14, 2011

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1 | '435 Patent claims | At least as early as September 28, 2001 |

2 **g. BNR Products (Patent L.R. 3.1(g)):**

3 At this time, BNR does not own an apparatus, product, device, process, method,
4 act, or other instrumentality that practices the claimed inventions.

5 **h. Willful Infringement (Patent L.R. 3.1(h)):**

6 Defendants have infringed and are continuing to infringe the Asserted Claims in
7 a manner that is willful, wanton, malicious, bad-faith, deliberate, consciously
8 wrongful, and flagrant. Defendants' egregious infringement is exemplified by the
9 following facts:

- 10 • Defendants have known of their infringement of the '889, '554, '842, '156,
11 '862, and '432 Patents since no later than December 1, 2017, when Mr. Afzal
12 Dean, President of BNR, sent Defendants a letter identifying these Patents
13 and notifying Defendants that their products (including examples thereof)
14 infringe the Asserted Claims of each Patent. Mr. Dean offered to meet and
15 present a detailed presentation to Defendants, describing the infringement.
 - 16 • On January 18, 2018 and February 6, 2018, BNR followed up by sending
17 additional letters regarding Defendants' infringement of the Asserted Claims
18 with respect to the '889, '554, '842, '156, '862, and '432 Patents.
 - 19 • BNR participated in meetings with Huawei on or about March 16, 2018,
20 April 23, 2018, and June 20, 2018 in Shenzhen, China, to discuss
21 Defendants' infringement of the '889, '554, '842, '862, and '432 Patents.
 - 22 • On September 14, 2018, Huawei executives met with BNR executives in
23 person and discussed, *inter alia*, Huawei's infringement of the '889, '554,
24 '842, '862, and '432 Patents.
 - 25 • Defendants have known of their infringement of the '450 and '435 Patents
26 since no later than November 13, 2018, when the Second Amended
27 Complaint in this action was filed.
- 28

1 BNR expressly reserves the right to amend or add to its willfulness contentions
2 as more information comes to light through its investigation and discovery in this
3 matter.
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Dated: December 7, 2018

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(* denotes pro hac vice to be filed)

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CERTIFICATE OF SERVICE


I hereby certify that on December 7, 2018, I served the foregoing document via email to the following counsel of record for the Defendants:

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/s/ Sadaf R. Abdullah

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

Asserted Claim Elements	Huawei Mate 10 Pro and Porsche Design Mate 10¹																								
<p>1. A mobile station, comprising:</p>	<p>To the extent that the preamble is found to be limiting, the Huawei Mate 10 Pro is a mobile station.</p> <div><p>The left image shows the 'About phone' screen with the following details:</p><table border="1"><tr><td>Device name</td><td>HUAWEI MATE 10 Pro</td></tr><tr><td>Model</td><td>BLA-A09</td></tr><tr><td>Build number</td><td>BLA-A09 8.0.0.110(C567)</td></tr><tr><td>EMUI version</td><td>8.0.0</td></tr><tr><td>Android version</td><td>8.0.0</td></tr><tr><td>IMEI</td><td>864160030211083</td></tr><tr><td>CPU</td><td>HiSilicon Kirin 970</td></tr><tr><td>RAM</td><td>6.0 GB</td></tr><tr><td>Internal storage</td><td>114 GB free 128 GB total</td></tr><tr><td>Screen</td><td>2160 x 1080</td></tr><tr><td>Android security patch</td><td>February 1, 2018</td></tr><tr><td>Baseband version</td><td>21C20871500000000</td></tr></table><p>The right image shows the back of the phone with a camera lens, a fingerprint sensor, and a sticker with the following information:</p><p>HUAWEI Mate 10 Pro Made in China IMEI: 864160030211083 S/N: Y0M021802001205 HUAWEI</p></div>	Device name	HUAWEI MATE 10 Pro	Model	BLA-A09	Build number	BLA-A09 8.0.0.110(C567)	EMUI version	8.0.0	Android version	8.0.0	IMEI	864160030211083	CPU	HiSilicon Kirin 970	RAM	6.0 GB	Internal storage	114 GB free 128 GB total	Screen	2160 x 1080	Android security patch	February 1, 2018	Baseband version	21C20871500000000
Device name	HUAWEI MATE 10 Pro																								
Model	BLA-A09																								
Build number	BLA-A09 8.0.0.110(C567)																								
EMUI version	8.0.0																								
Android version	8.0.0																								
IMEI	864160030211083																								
CPU	HiSilicon Kirin 970																								
RAM	6.0 GB																								
Internal storage	114 GB free 128 GB total																								
Screen	2160 x 1080																								
Android security patch	February 1, 2018																								
Baseband version	21C20871500000000																								

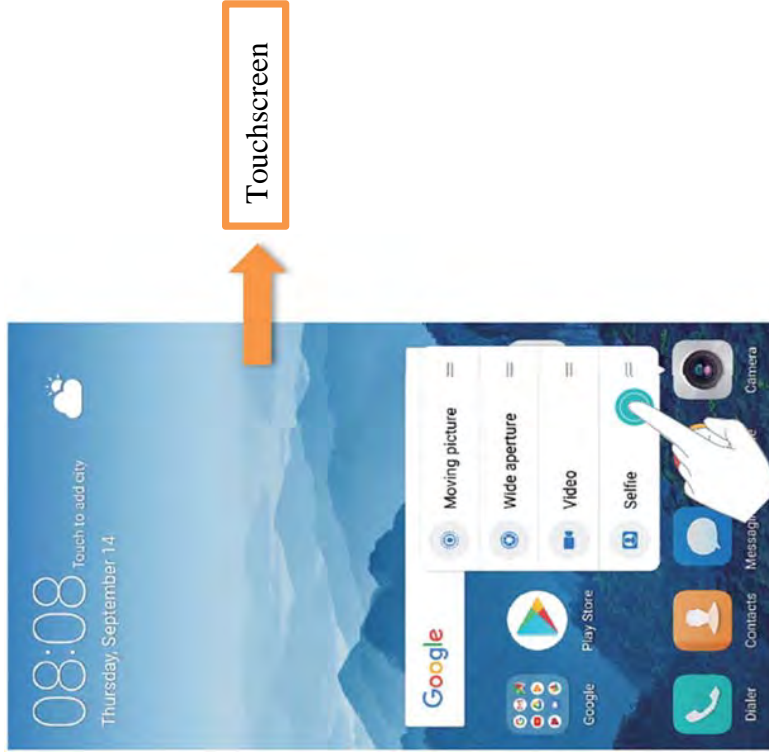
¹ The Huawei Mate 10 Pro and the Huawei Porsche Design Mate 10 share all relevant hardware components and software functionalities. The only internal difference is that the Porsche Design Mate 10 includes more on-board storage; but this difference does not

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

[i] a display;

The Huawei Mate 10 Pro includes a display.



See <https://consumer.huawei.com/uk/support/phones/mate10-pro/> p. 1, last accessed Nov 21, 2018.

relate to the accused functionalities. See https://www.phonearena.com/news/Huawei-Mate-10-Pro-Mate-10-Porsche-Design-differences_id102298, last accessed December 5, 2018.

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

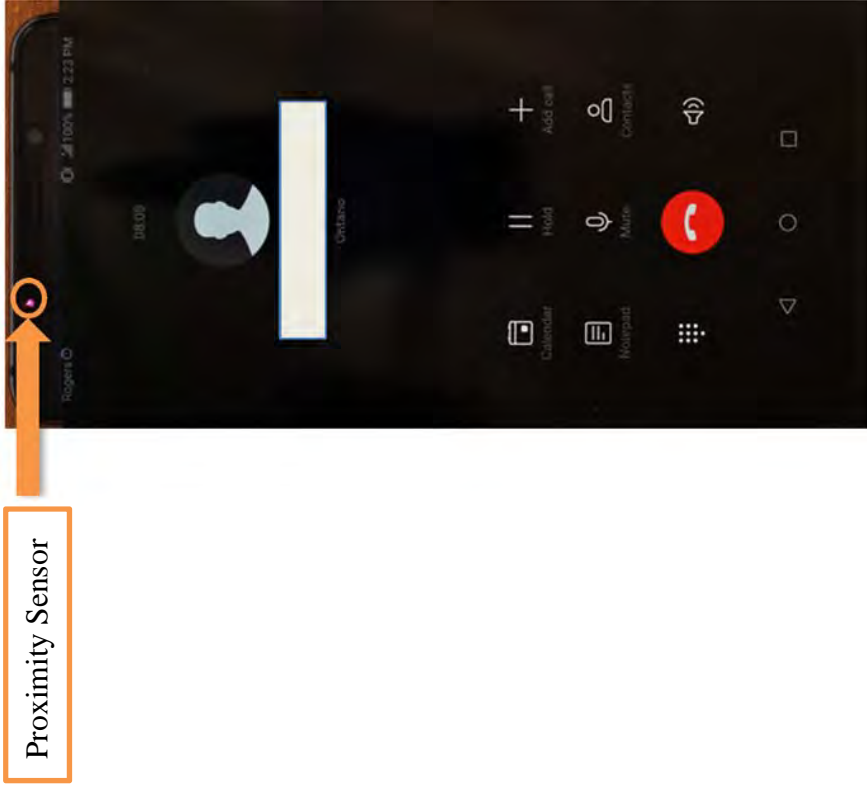
<p>[ii] a proximity sensor</p>	<p>The Huawei Mate 10 Pro includes a proximity sensor.</p> 

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate; and

The proximity sensor of the Huawei Mate 10 Pro is adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate.

By way of example only, the Huawei Mate 10 Pro is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
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See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.

```
TYPE_PROXIMITY
public static final int TYPE_PROXIMITY
A constant describing a proximity sensor type. This is a wake up sensor.
See SensorEvent.values for more details.
See also:
isWakeUpSensor\(\)
Constant Value: 8 (0x00000008)
```

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

Exhibit B-1 – Infringement of U.S. Patent No. 8,204,554

The referenced discussion concerning the isWakeUpSensor file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:

isWakeUpSensor added in API level 21

public boolean isWakeUpSensor ()

Returns true if the sensor is a wake-up sensor.

Application Processor Power modes

Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "suspend" mode, reducing the power consumption by 10 times or more.

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent maxFifoEventCount() == 0, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's onPause method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

[SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor "to determine how far away a person's head is from the face of a handset device (for example, when a user making or receiving a phone call)."

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

<pre>KOTLIN JAVA class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	
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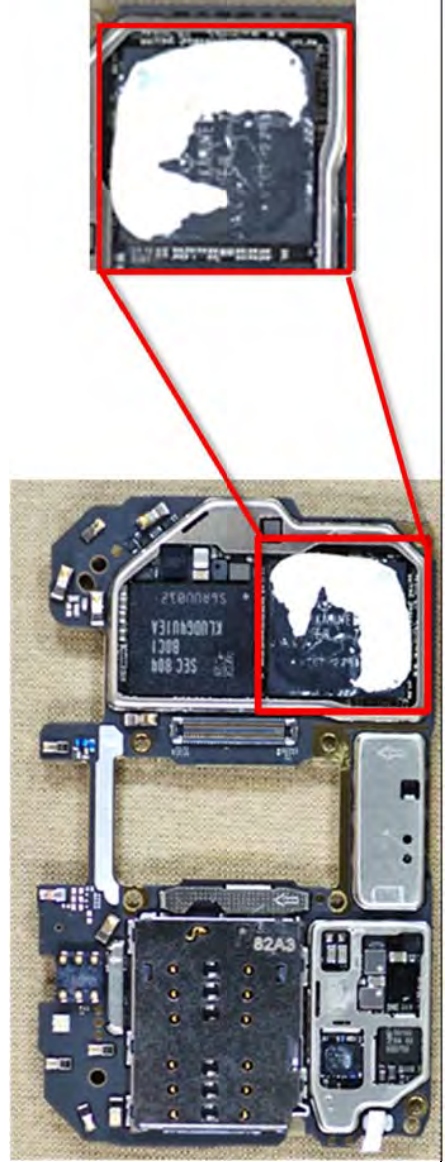
BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

```
override fun onSensorChanged(event: SensorEvent) {  
    val distance = event.values[0]  
    // Do something with this sensor data.  
}  
  
override fun onResume() {  
    // Register a listener for the sensor.  
    super.onResume()  
  
    mProximity?.also { proximity ->  
        mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL)  
    }  
  
    override fun onPause() {  
        // Be sure to unregister the sensor when the activity pauses.  
        super.onPause()  
        mSensorManager.unregisterListener(this)  
    }  
}
```

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.

The Huawei Mate 10 Pro includes at least one microprocessor.



[iv] a microprocessor adapted to:

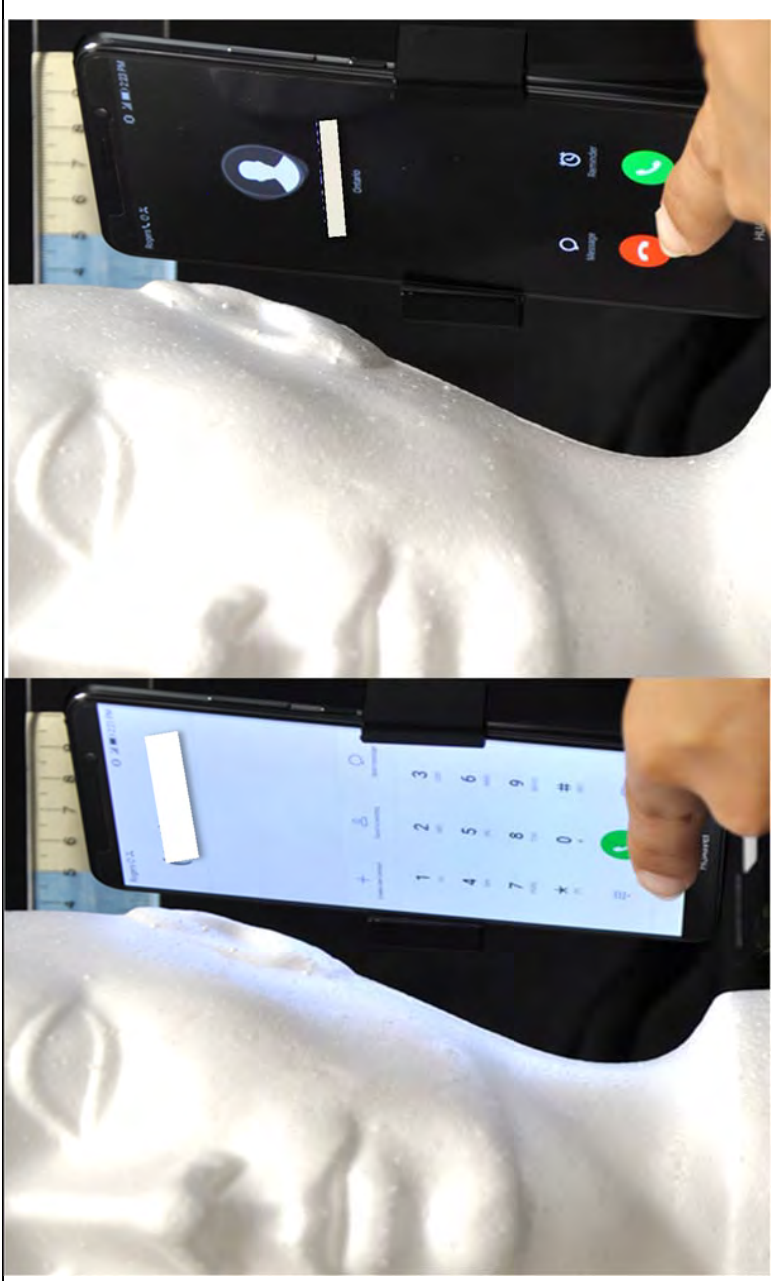
BNR’S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1–Infringement of U.S. Patent No. 8,204,554

	<p>“Chipset: Huawei Kirin 970” See https://consumer.huawei.com/en/phones/mate10-pro/specs/, last accessed Nov 21, 2018.</p>
<p>(a) determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Mate 10 Pro is adapted to determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call. The microprocessor is able to determine when the user initiates an outgoing call or answers an incoming call.</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554



By way of example only, the Huawei Mate 10 Pro is an Android phone. The Huawei Mate 10 Pro's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;

Outgoing Call:

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

```
/**  
 * Broadcast receiver to detect the outgoing calls.  
 */  
public class OutgoingReceiver extends BroadcastReceiver {  
    public OutgoingReceiver() {  
    }  
    @Override  
    public void onReceive(Context context, Intent intent) {  
        String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER);  
        Toast.makeText(ctx,  
            "Outgoing: "+number,  
            Toast.LENGTH_LONG).show();  
    }  
}
```

In the above, the system sends a broadcast action `android.intent.action.NEW_OUTGOING_CALL`.

Incoming Call:

```
/**  
 * Listener to detect incoming calls.  
 */  
private class CallStateListener extends PhoneStateListener {  
    @Override  
    public void onCallStateChanged(int state, String incomingNumber) {  
        switch (state) {  
            case TelephonyManager.CALL_STATE_RINGING:  
                // called when someone is ringing to this phone  
                Toast.makeText(ctx,  
                    "Incoming: "+incomingNumber,  
                    Toast.LENGTH_LONG).show();  
                break;  
        }  
    }  
}
```

In the above, state is the call state, where it may be `CALL_STATE_RINGING`, `CALL_STATE_OFFHOOK`, or `CALL_STATE_IDLE`. Ringing is the state when someone is calling,

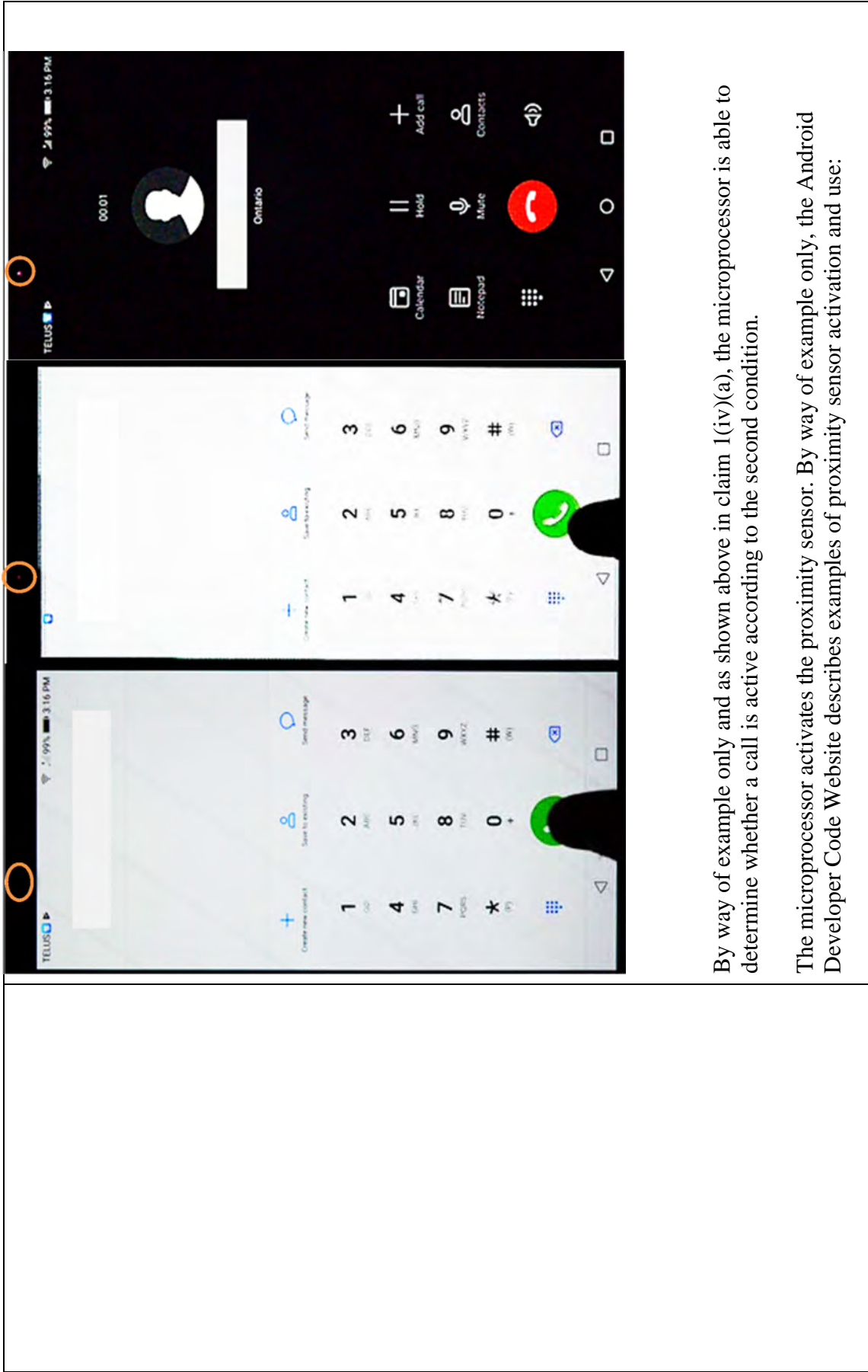
BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1–Infringement of U.S. Patent No. 8,204,554

	<p>offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Mate 10 Pro is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554



By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.

The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <pre>isWakeUpSensor()</pre> <p>Constant Value: 8 (0x00000008)</p> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>	<pre>isWakeUpSensor</pre> <p>added in API level 21</p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p>
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Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Mate 10 Pro, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Mate 10 Pro is adapted to receive the signal from the activated proximity sensor.</p> <p>When the call button or answer button is pressed according to the above, the display darkens, indicated that the microprocessor received the signal from the activated proximity sensor that an object was proximate, and, in turn, reduced power to the display.</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

	<p>By way of further example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:</p>
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Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>	

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p>	
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BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

The microprocessor of the Huawei Mate 10 Pro is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

By way of example only, the first image shows that the Huawei Mate 10 Pro is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



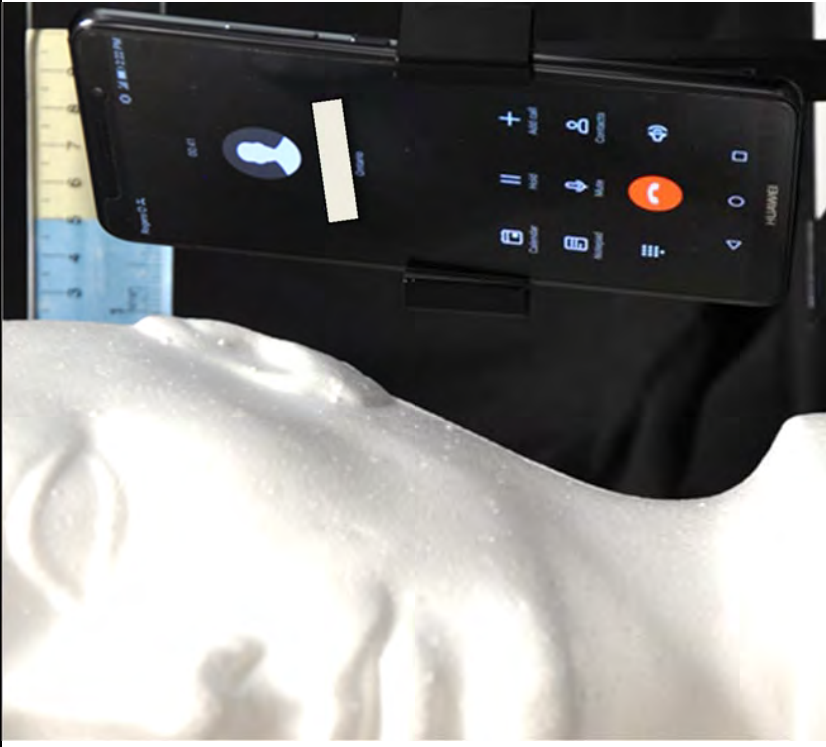
The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Mate 10 Pro, power to the display is reduced and the display is darkened.

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554



The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.

Exhibit B-1–Infringement of U.S. Patent No. 8,204,554

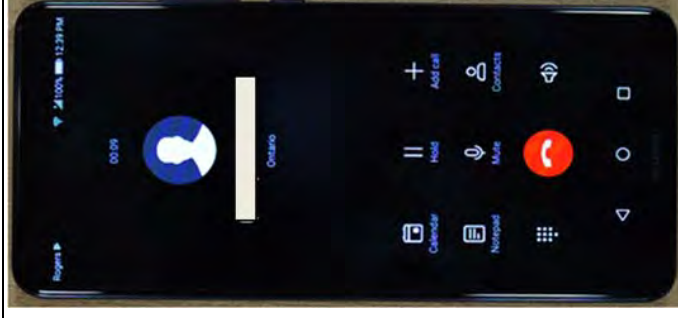

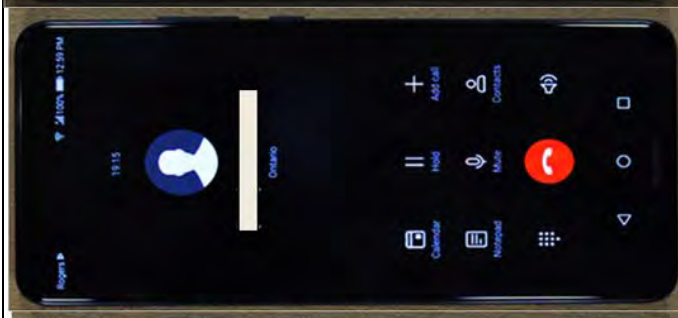
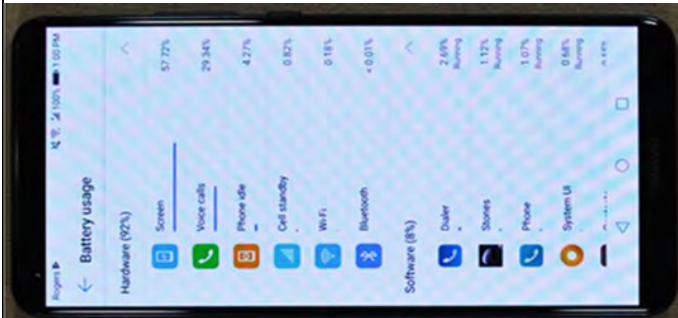


The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.

By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally.

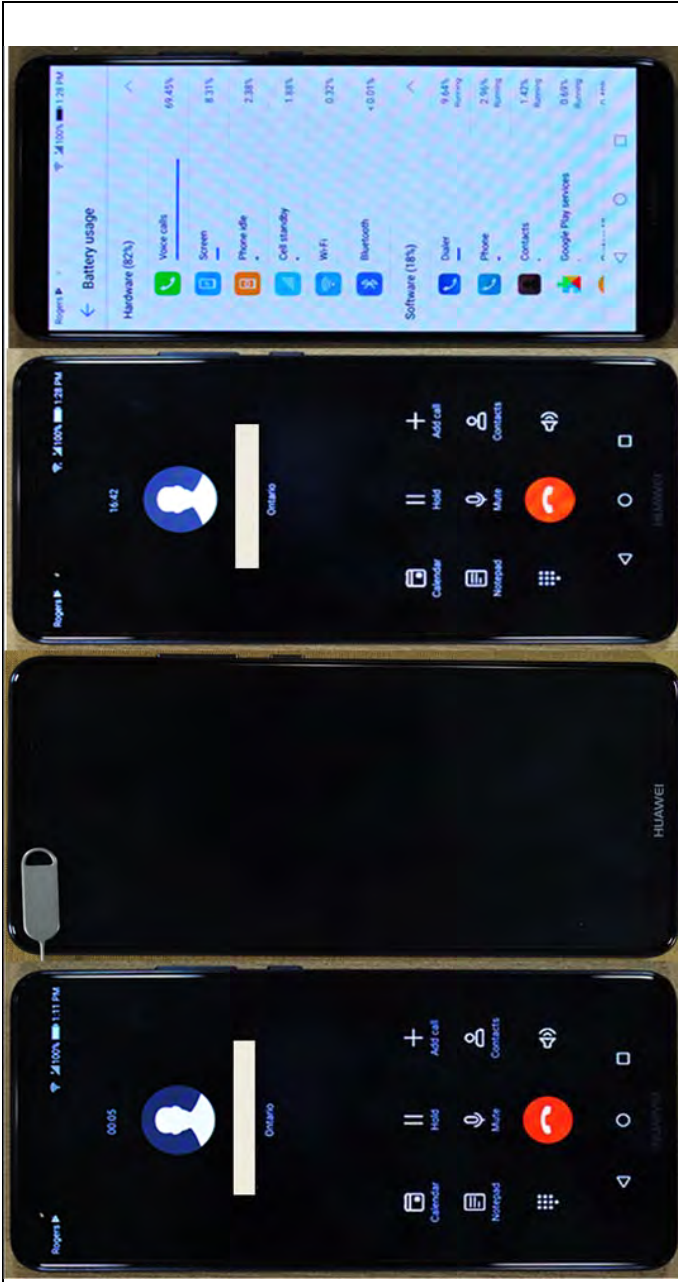
BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1–Infringement of U.S. Patent No. 8,204,554

				
	<p>When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 57.72% of the battery usage.</p> <p>The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.</p>			

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554



When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 8.31% of the battery usage.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of further example, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:

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	<div> <p>TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</p> <p>Phone position during a call.</p> </div> <div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> </div> <div> <p>In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”</p> </div> <div> <p>Use the proximity sensor</p> </div> <div> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> </div> <div> <pre> KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) </pre> </div> <div> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p> </div>
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Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

<pre>override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) }</pre>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>2. The mobile station of claim 1,</p>	<p>See claim 1.</p>

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Exhibit B-1–Infringement of U.S. Patent No. 8,204,554

further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

The microprocessor of the Huawei Mate 10 Pro increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of example only, the first image shows that the Huawei Mate 10 Pro is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Mate 10 Pro, power to the display is reduced and the display is darkened.


Exhibit B-1—Infringement of U.S. Patent No. 8,204,554



The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

	 <p>By way of further example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call).” See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.</p>
<p>4. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

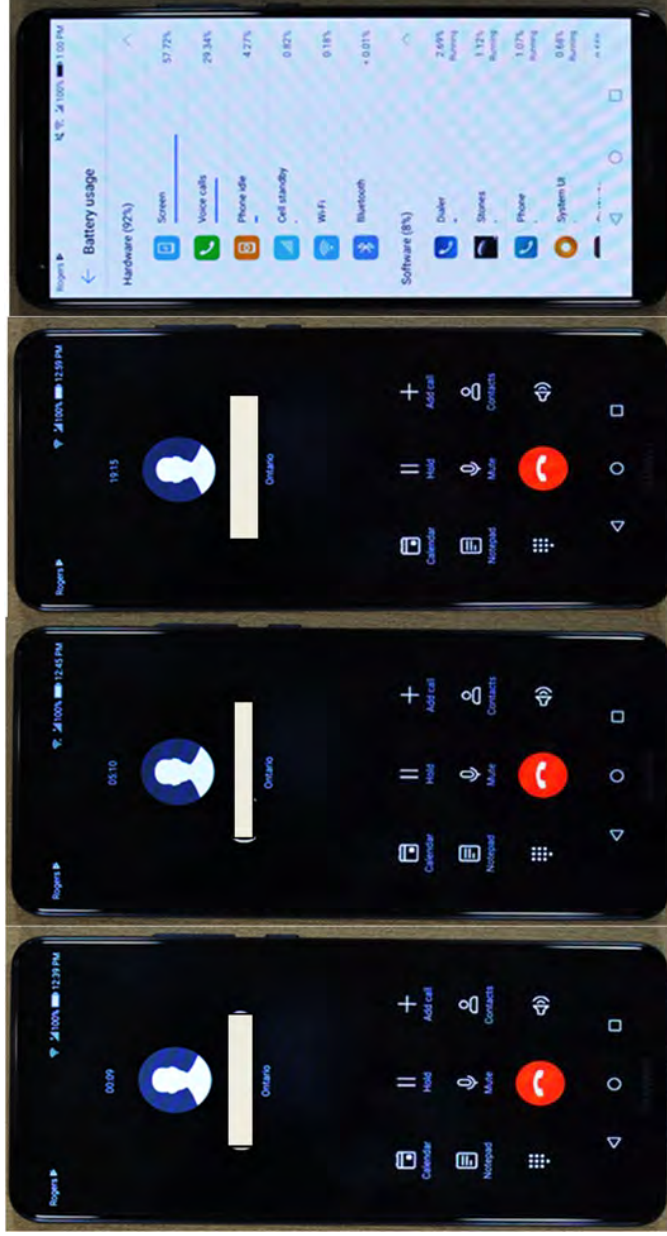
Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

<p>wherein the microprocessor reduces power to the display by turning off the display.</p>	<p>The microprocessor of the Huawei Mate 10 Pro reduces power to the display by turning off the display.</p> <p>When the call button or answer button is pressed and the ear is proximate to the Huawei Mate 10 Pro, power to the display is reduced and the display is turned off.</p>  <p>The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.</p>
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BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1–Infringement of U.S. Patent No. 8,204,554

By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally

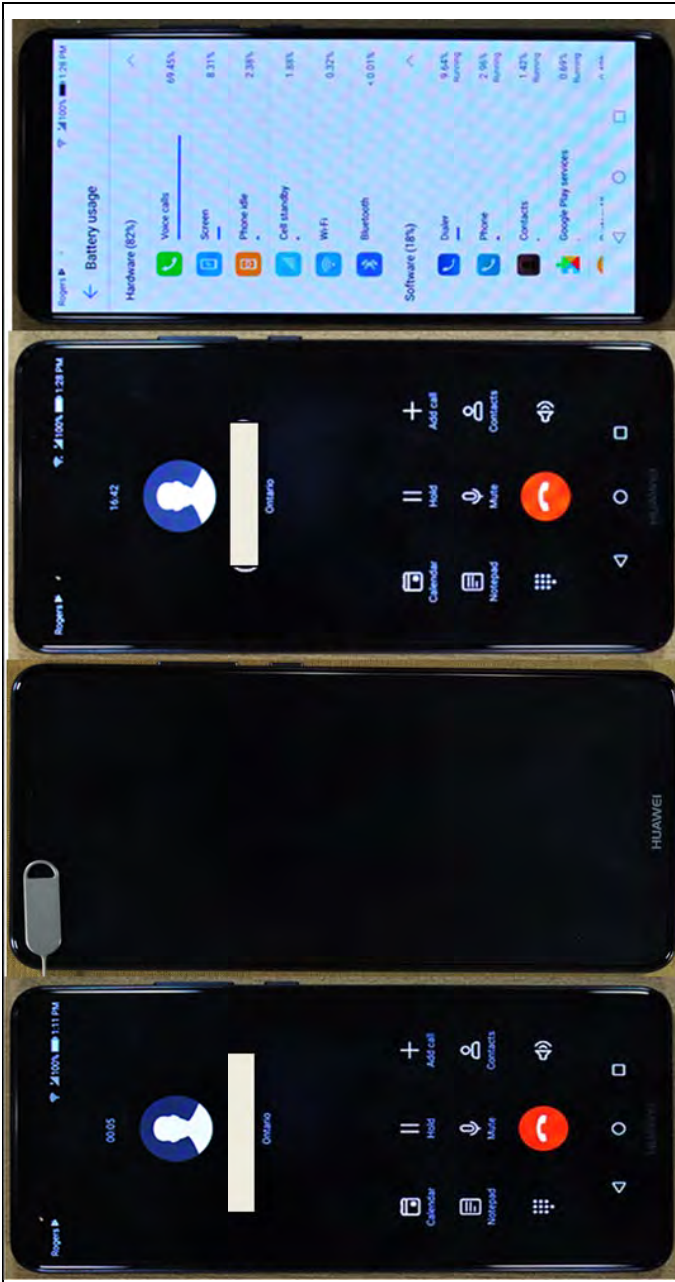


When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 57.72% of the battery usage.

The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.

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When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 8.31% of the battery usage.

By way of further example only, the Android Developer Code Website describes the proximity sensor's signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor</pre> <p>added in API level 21</p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p>	

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Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See [SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See <https://developer.android.com/guide/topics/sensors/sensors/overview>, last accessed November 29, 2018.

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
--	--

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Mate 10 Pro is a range-detecting sensor.</p>

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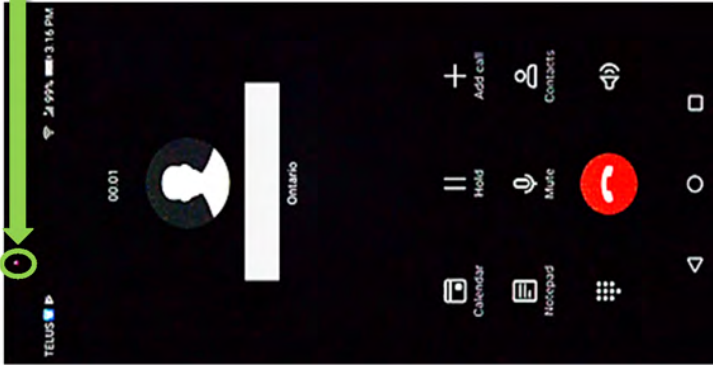
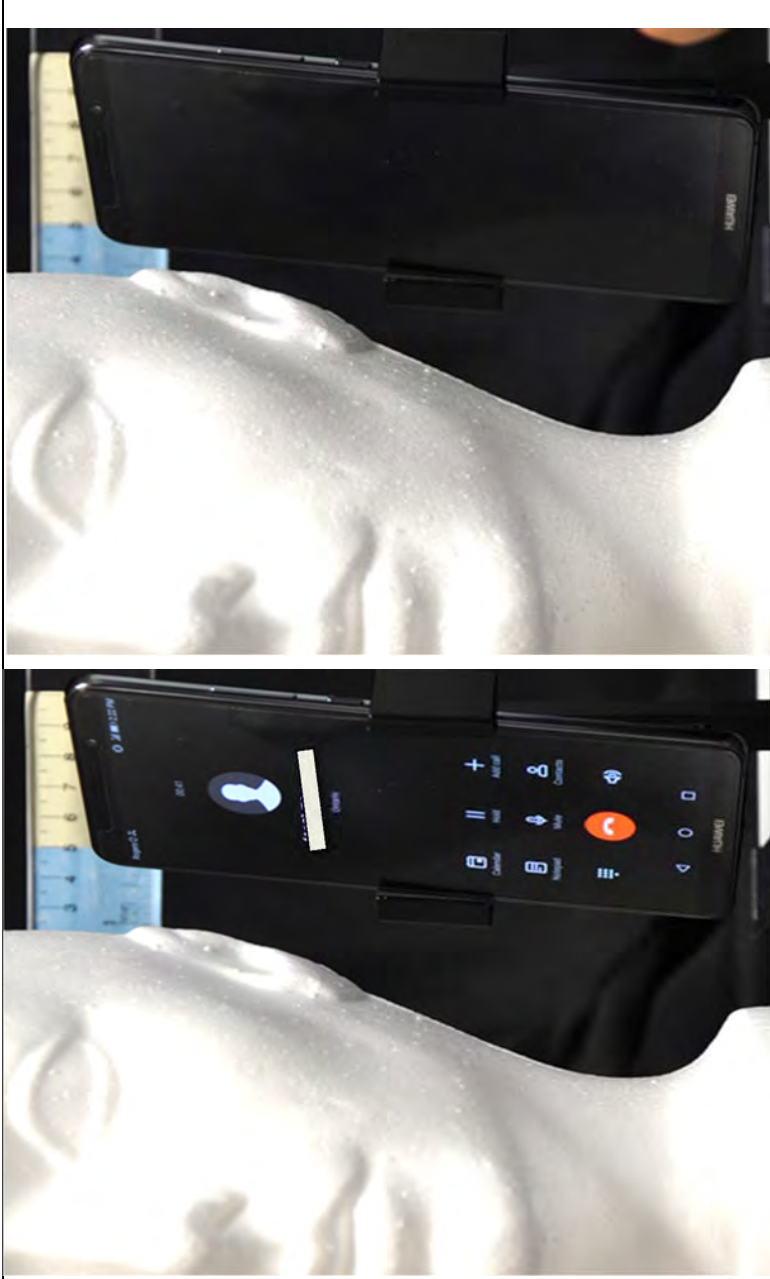
	<p>The proximity sensor detects the range of a proximate object:</p> <p><i>The optical range sensing proximity sensor emits Inf Red light senses the reflection to determine if external objects are proximate</i></p>  <p>By way of example only, when an incoming call is answered, and the device is not proximate to the object, approximately 7 cm from the object the display is on. The mobile station is moved proximate to the ear, approximately 4cm the display is off.</p>
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Exhibit B-1—Infringement of U.S. Patent No. 8,204,554



By way of further example, the Android Developer Code Website describes range detection in proximity sensors:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
-----------------------	----------	---	-------------------------------

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

And also, the code shows distance measurement:

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

```
override fun onSensorChanged(event: SensorEvent) {  
    val distance = event.values[0]  
    // Do something with this sensor data.  
}
```

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.

The Android Developer Code Website further explains:

★ **Note:** Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the `getMaximumRange()` method.

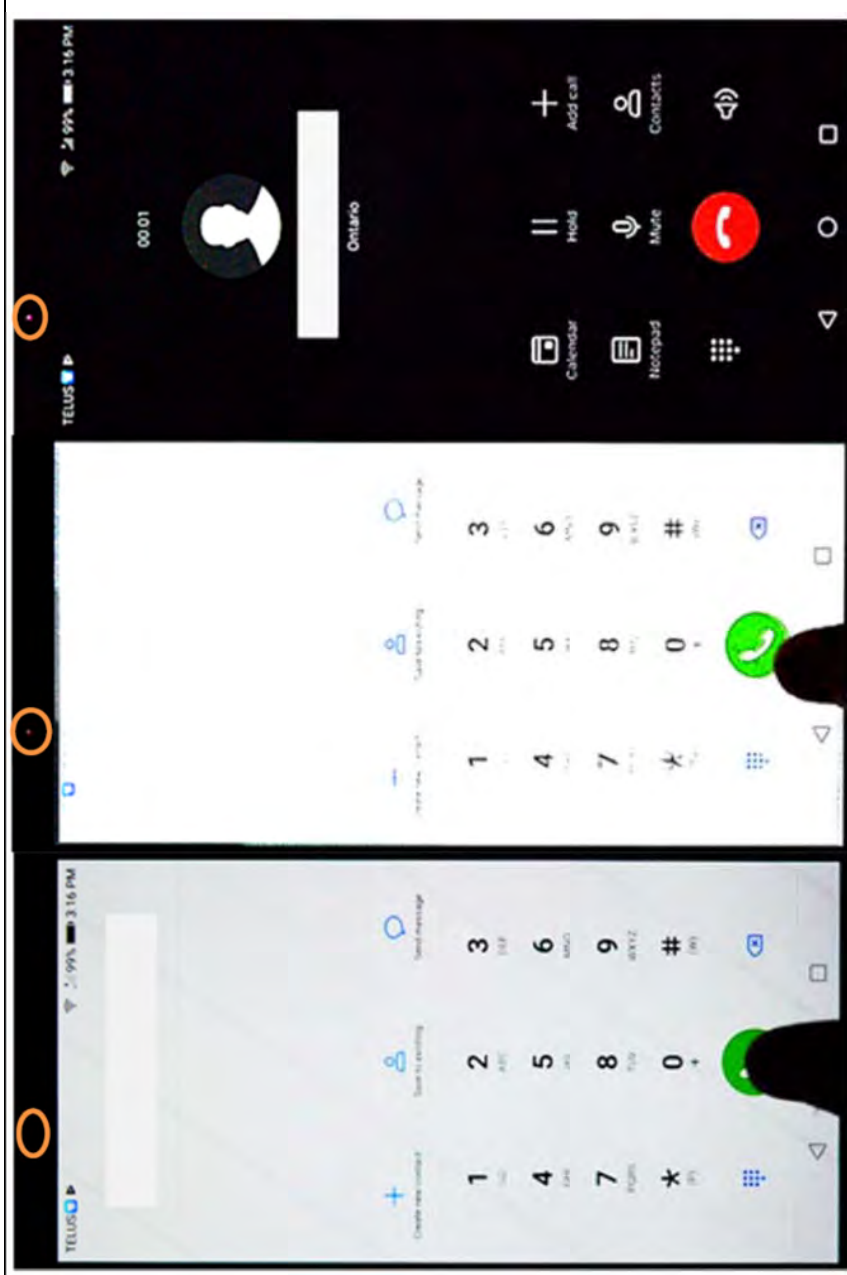
See id.

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The proximity sensor of the Huawei Mate 10 Pro begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p>

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554



In addition, by way of further example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating or receiving a call, including by providing exemplary code at least substantially similar to Huawei code:

Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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Exhibit B-1—Infringement of U.S. Patent No. 8,204,554

	KOTLIN	JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1–Infringement of U.S. Patent No. 8,204,554

	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1(preamble); 1 [ii]-[iii]; 1(b)-(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call</p>	<p>The Huawei Mate 10 Pro detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1–Infringement of U.S. Patent No. 8,204,554

<p>condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p> <p><i>See claim 1 (a).</i></p>	<p>that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p> <p><i>See claim 1 (a).</i></p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Mate 10 Pro activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists.</p> <p><i>See claim 1 (b).</i></p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Mate 10 Pro reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p> <p><i>See claim 1 (c)-(d).</i></p>
<p>14. A mobile station, comprising:</p>	<p><i>See claim 1 (preamble).</i></p>
<p>a display;</p>	<p><i>See claim 1 [i].</i></p>
<p>a proximity sensor</p>	<p><i>See claim 1 [ii].</i></p>
<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p><i>See claim 1 [iii].</i></p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-1 – Infringement of U.S. Patent No. 8,204,554

<p>and a microprocessor adapted to:</p> <p>(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>See claim [iv].</p> <p>The microprocessor of the Huawei Mate 10 Pro is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p>See claim 1(a).</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>See claim 1(b).</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>See claim 1(c).</p>
<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p>See claim 1(d).</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-2 – Infringement of U.S. Patent No. 8,204,554

Asserted Claim Elements	Huawei Ascend XT2
<p>1. A mobile station, comprising:</p>	<p>To the extent that the preamble is found to be limiting, the Huawei Ascend XT2 is a mobile station.</p> <div style="display: flex; justify-content: space-around;">   </div>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-2 – Infringement of U.S. Patent No. 8,204,554

[i] a display;

The Huawei Ascend XT2 includes a display.



See http://consumer-tkb.huawei.com/ccpgw/msa/TKB/app_0000000000011227-CcpTKBKnowOut/cikbknowout/serylet/show/knowAttachmentServlet?knowId=en-us00350616_last accessed Nov 30, 2018.

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Exhibit B-2 – Infringement of U.S. Patent No. 8,204,554

[ii] a proximity sensor

The Huawei Ascend XT2 includes a proximity sensor.



See http://consumer-tkb.huawei.com/ccpgw/msa/TKB/app_000000000011227-CcpTKBKnowOut/cikbknowout/servlet/show/knowAttachmentServlet?knowId=en-us00350616_last accessed Nov 30, 2018.

Exhibit B-2 – Infringement of U.S. Patent No. 8,204,554

[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate; and

The proximity sensor of the Huawei Ascend XT2 is adapted to generate a signal indicative of existence of a first condition, the first condition being that an external object is proximate.

By way of example only, the Huawei Ascend XT2 is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
-----------------------	-----------------	---	--------------------------------------

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.

```

TYPE_PROXIMITY
public static final int TYPE_PROXIMITY
A constant describing a proximity sensor type. This is a wake up sensor.
See SensorEvent.values for more details.
See also:
isWakeUpSensor\(\)
Constant Value: 8 (0x00000008)
    
```

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

Exhibit B-2 – Infringement of U.S. Patent No. 8,204,554

The referenced discussion concerning the isWakeUpSensor file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:

isWakeUpSensor added in API level 21

public boolean isWakeUpSensor ()

Returns true if the sensor is a wake-up sensor.

Application Processor Power modes

Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "suspend" mode, reducing the power consumption by 10 times or more.

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent, maxFifoEventCount() == 0, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's onPause method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

[SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor "to determine how far away a person's head is from the face of a handset device (for example, when a user making or receiving a phone call)."

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<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

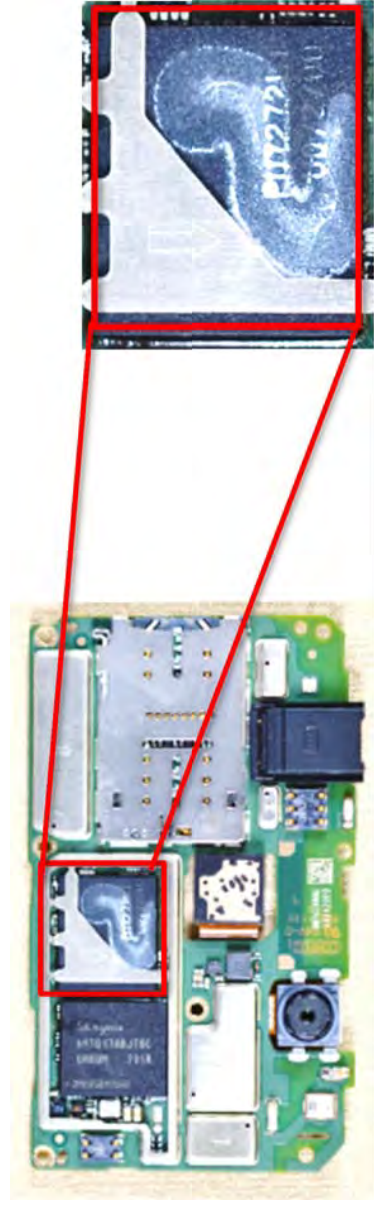
Exhibit B-2 – Infringement of U.S. Patent No. 8,204,554

```
override fun onSensorChanged(event: SensorEvent) {  
    val distance = event.values[0]  
    // Do something with this sensor data.  
}  
  
override fun onResume() {  
    // Register a listener for the sensor.  
    super.onResume()  
  
    mProximity?.also { proximity ->  
        mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL)  
    }  
}  
  
override fun onPause() {  
    // Be sure to unregister the sensor when the activity pauses.  
    super.onPause()  
    mSensorManager.unregisterListener(this)  
}
```

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.

[iv] a microprocessor adapted to:

The Huawei Ascend XT2 includes at least one microprocessor.



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	<p>“Chipset: Qualcomm Snapdragon 435 (MSM8940) Octa-Core (4 x 1.4 GHz+4 x 1.1 GHz)”</p> <p>See https://consumer.huawei.com/us/phones/ascend-xt2/specs/, last accessed Nov 30, 2018.</p>
<p>(a) determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Ascend XT2 is adapted to determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p>The microprocessor is able to determine when the user initiates an outgoing call or answers an incoming call.</p>
	

Exhibit B-2 – Infringement of U.S. Patent No. 8,204,554

By way of example only, the Huawei Ascend XT2 is an Android phone. The Huawei Ascend XT2's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;

Outgoing Call:

```
/**  
 * Broadcast receiver to detect the outgoing calls.  
 */  
public class OutgoingReceiver extends BroadcastReceiver {  
    public OutgoingReceiver() {  
    }  
    @Override  
    public void onReceive(Context context, Intent intent) {  
        String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER);  
        Toast.makeText(ctx,  
            "Outgoing: "+number,  
            Toast.LENGTH_LONG).show();  
    }  
}
```

In the above, the system sends a broadcast action android.intent.action.NEW_OUTGOING_CALL.

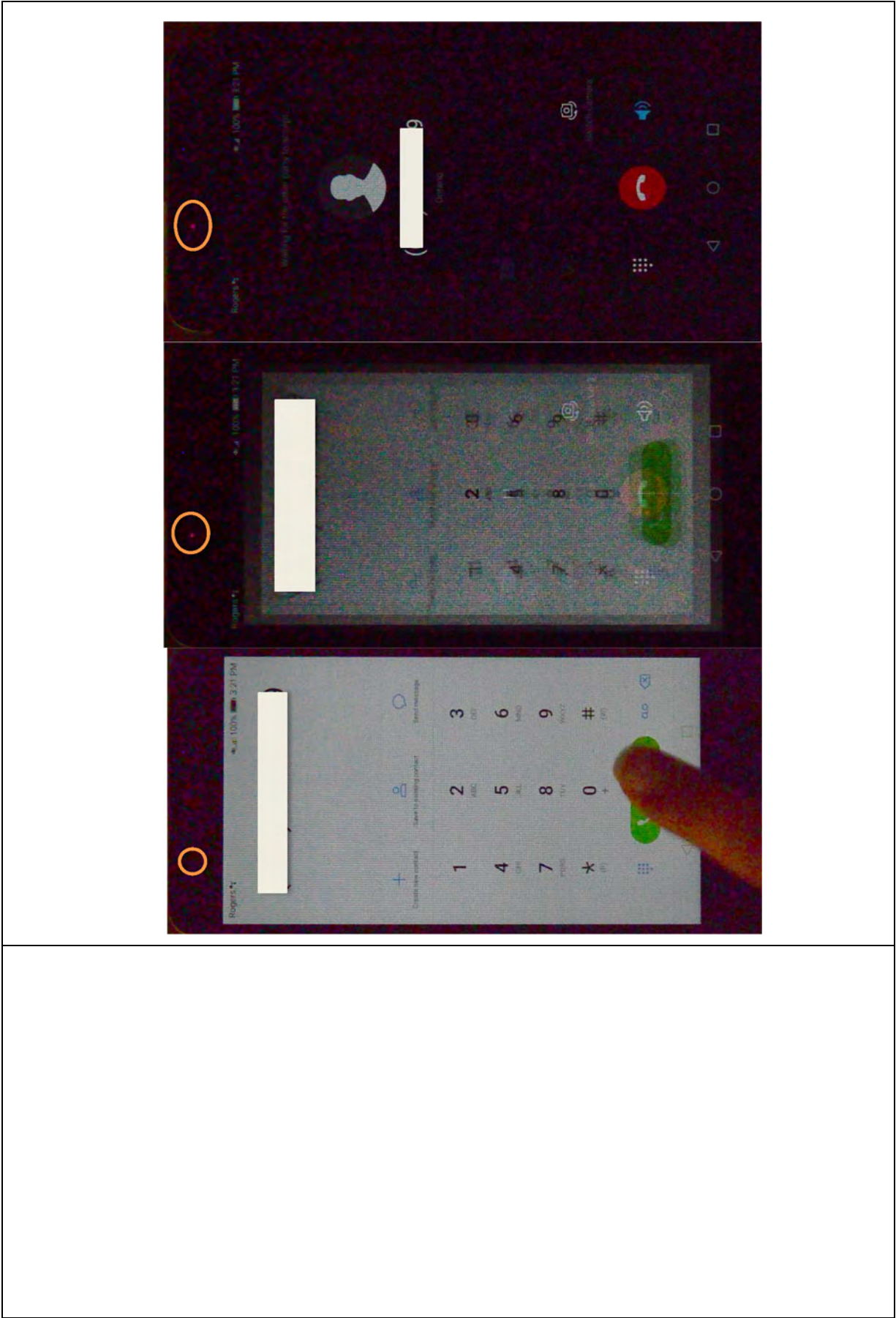
Incoming Call:

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	<pre> /** * Listener to detect incoming calls. */ private class CallStateListener extends PhoneStateListener { @Override public void onCallStateChanged(int state, String incomingNumber) { switch (state) { case TelephonyManager.CALL_STATE_RINGING: // called when someone is ringing to this phone Toast.makeText(ctx, "Incoming: "+incomingNumber, Toast.LENGTH_LONG).show(); break; } } } } </pre> <p>In the above, state is the call state, where it may be CALL_STATE_RINGING, CALL_STATE_OFFHOOK, or CALL_STATE_IDLE. Ringing is the state when someone is calling, offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Ascend XT2 is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p>

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	<p>By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.</p> <p>The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:</p> <p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>
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BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-2 – Infringement of U.S. Patent No. 8,204,554

	<p style="text-align: right; font-size: small;">added in API level 21</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Ascend XT2, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Ascend XT2 is adapted to receive the signal from the activated proximity sensor.</p>

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(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

The microprocessor of the Huawei Ascend XT2 is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

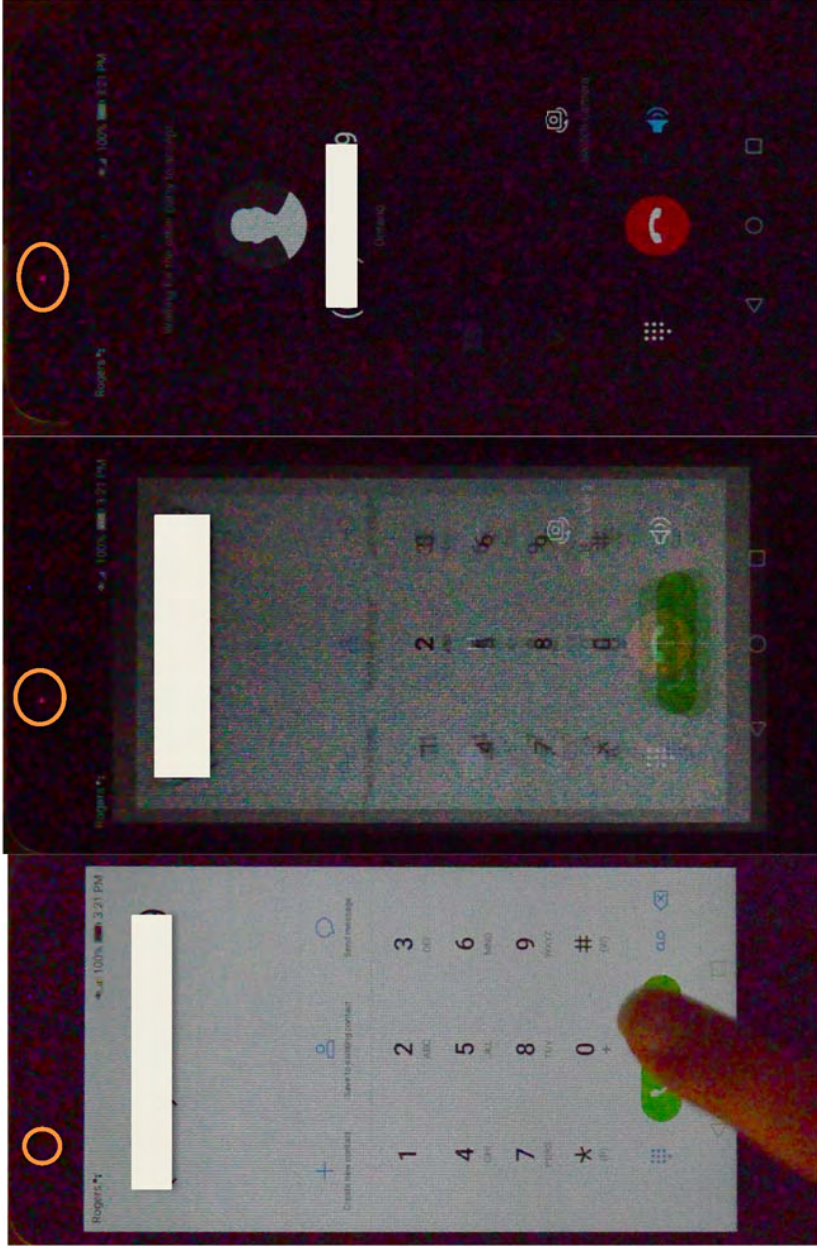
When the call button or answer button is pressed according to the above, the display darkens, indicated that the microprocessor received the signal from the activated proximity sensor that an object was proximate, and, in turn, reduced power to the display.



The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is

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activated. Third image shows the proximity sensor remains activated during the remainder of the call.



By way of further example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:

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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor</pre> <p>added in API level 21</p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p>	

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<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See <code>SensorManager.registerListener(SensorEventListener, Sensor, int, int)</code> for more details.</p> <p><i>See <u>https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()</u>, last accessed November 29, 2018.</i></p>	
<p>2. The mobile station of claim 1,</p>	<p><i>See claim 1.</i></p>

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further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

The microprocessor of the Huawei Ascend XT2 increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of example only, the first image shows that the Huawei Ascend XT2 is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Ascend XT2, power to the display is reduced and the display is darkened.

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The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.

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	 <p>By way of further example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person’s head is from the face of a handset device (for example, when a user is making or receiving a phone call).” <i>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.</i></p>
<p>4. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>

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wherein the microprocessor reduces power to the display by turning off the display.

The microprocessor of the Huawei Ascend XT2 reduces power to the display by turning off the display.


When the call button or answer button is pressed and the ear is proximate to the Huawei Ascend XT2, power to the display is reduced and the display is turned off.



The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.

By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally

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	 <p>When the call begins, the battery starts at a charge of 100%. After the call, the battery is at 97%. The screen consumed 49.32% of the battery.</p> <p>The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.</p>
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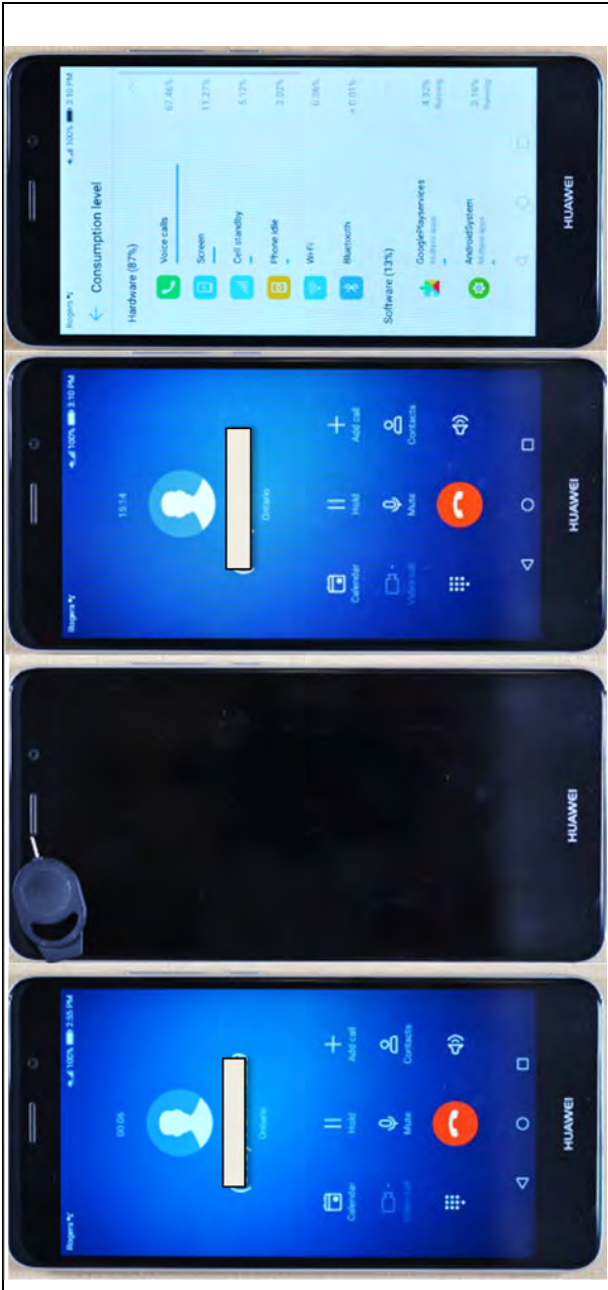
	<p>When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 11.27% of the battery.</p> <p>By way of further example only, the Android Developer Code Website describes the proximity sensor's signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:</p>
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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x000000008)</p>
	<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>

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Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See [SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See <https://developer.android.com/guide/topics/sensors/sensors/overview>, last accessed November 29, 2018.

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<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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	KOTLIN	JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Ascend XT2 is a range-detecting sensor.</p>

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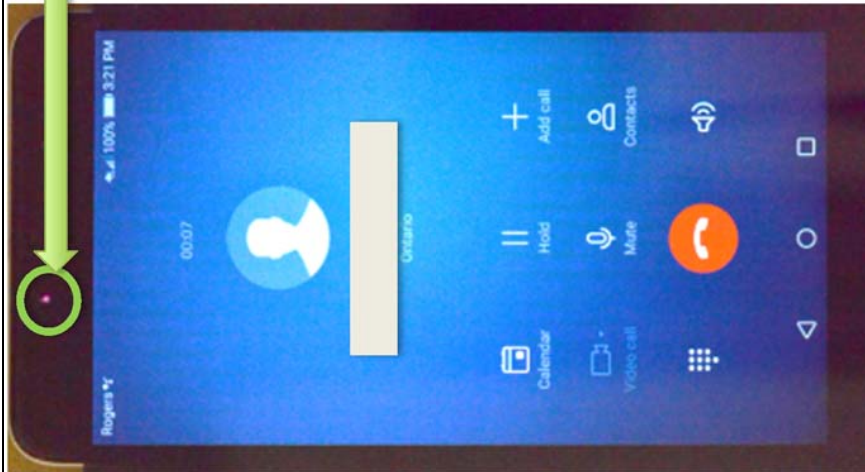
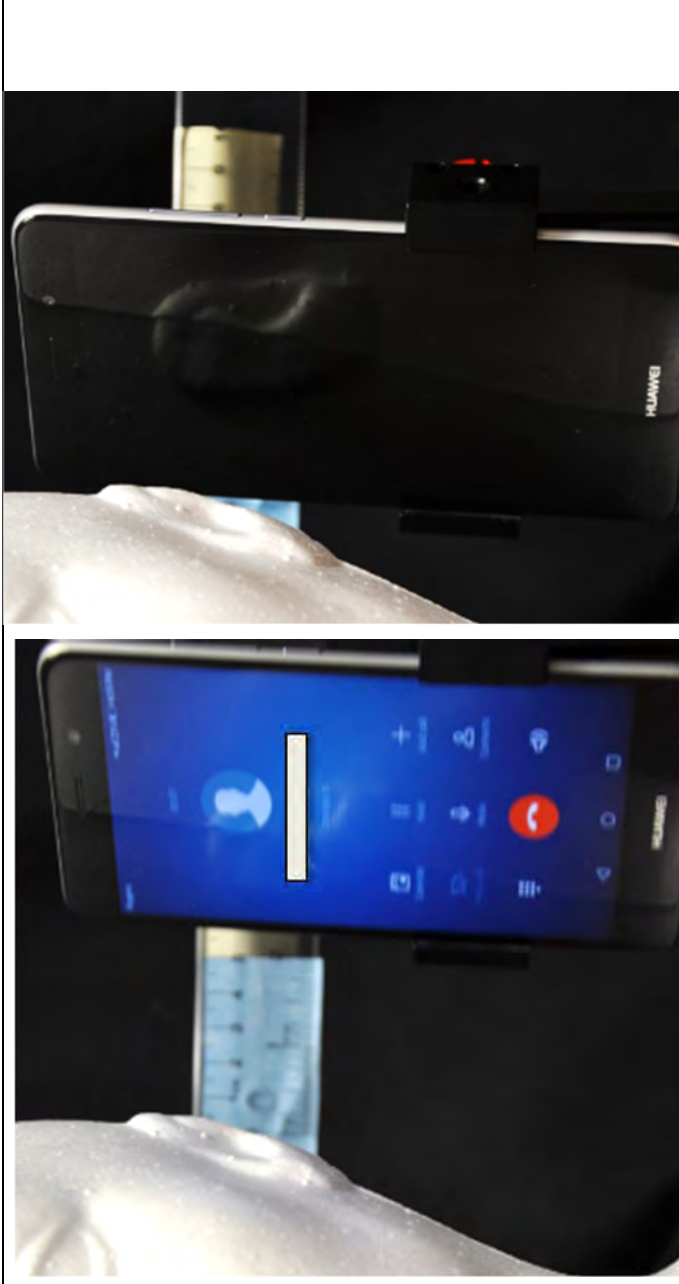
	 <p><i>The optical range sensing proximity sensor emits Inf Red light senses the reflection to determine if external objects are proximate</i></p> <p>The proximity sensor detects the range of a proximate object: By way of example only, when an incoming call is answered, and the device is not proximate to the object, approximately 7 cm from the object the display is on. The mobile station is moved proximate to the ear, approximately 4cm the display is off.</p>
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By way of further example, the Android Developer Code Website describes range detection in proximity sensors:

```
TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear. Phone position during a call.
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See <https://developer.android.com/guide/topics/sensors/sensors/overview>, last accessed November 29, 2018.

And also, the code shows distance measurement:

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	<pre>override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. }</pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>The Android Developer Code Website further explains:</p> <p>★ Note: Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the <code>getMaximumRange()</code> method.</p> <p><i>See id.</i></p>
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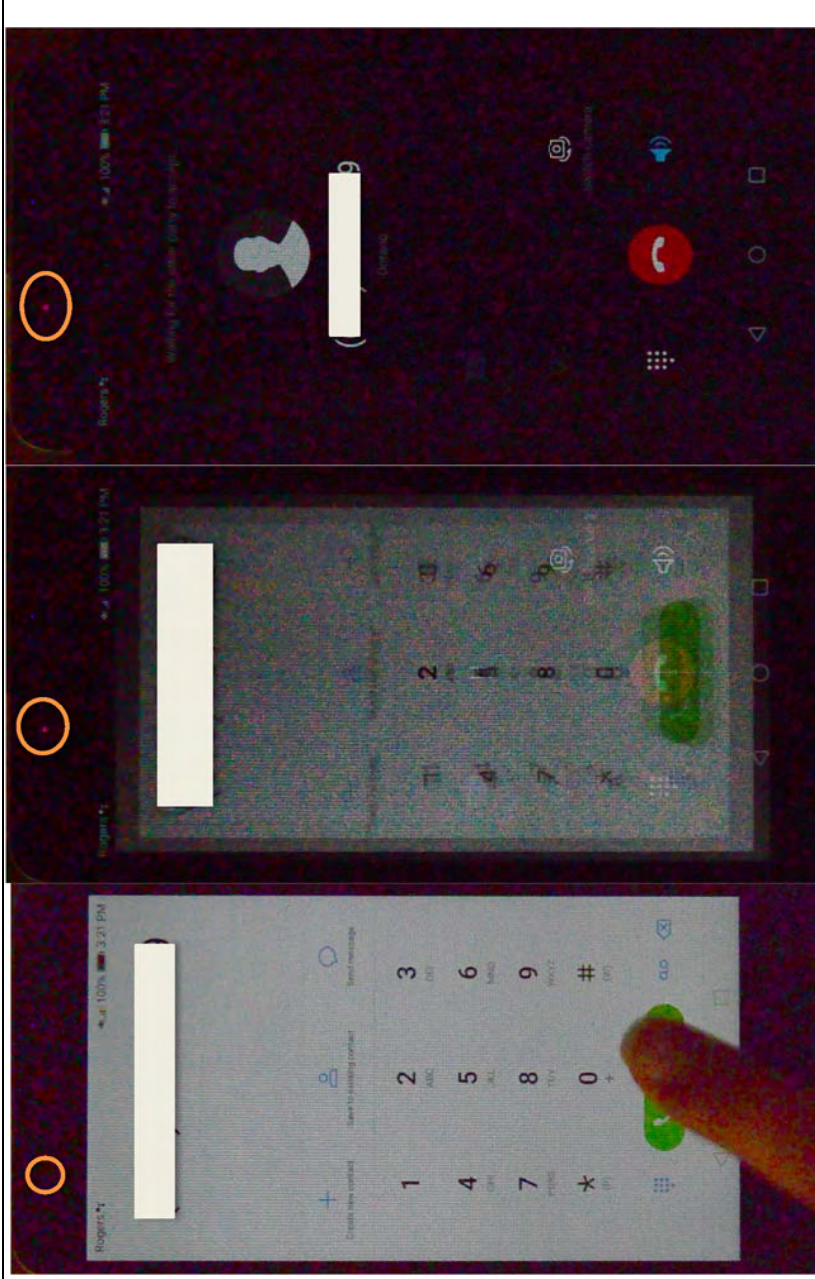
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<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The proximity sensor of the Huawei Ascend XT2 begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p>

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In addition, by way of further example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating or receiving a call, including by providing exemplary code at least substantially similar to Huawei code:

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	<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>
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	KOTLIN	JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1 (preamble); 1[ii]-[iii]; 1(b)-(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call condition independent and different</p>	<p>The Huawei Ascend XT2</p> <p>T detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile</p>

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<p>from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call;</p>	<p>station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call. <i>See claim 1 (a).</i></p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Ascend XT2 T activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists. <i>See claim 1 (b).</i></p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Ascend XT2 T reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists. <i>See claim 1 (c)-(d).</i> <i>See claim 1 (preamble).</i></p>
<p>14. A mobile station, comprising:</p>	
<p>a display;</p>	<p><i>See claim 1 [i].</i></p>
<p>a proximity sensor</p>	<p><i>See claim 1 [ii].</i></p>
<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p><i>See claim 1 [iii].</i></p>
<p>and a microprocessor adapted to:</p>	<p><i>See claim [iv].</i></p>



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<p>(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Ascend XT2 is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p><i>See claim 1(a).</i></p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p><i>See claim 1(b).</i></p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p><i>See claim 1(c).</i></p>
<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p><i>See claim 1(d).</i></p>

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Asserted Claim Elements	Huawei Elate																						
<p>1. A mobile station, comprising:</p>	<p>To the extent that the preamble is found to be limiting, the Huawei Elate is a mobile station.</p> <div data-bbox="414 745 1201 1165"><p>The screenshot shows the 'Status' page of a mobile phone. The status bar at the top indicates signal strength, 100% battery, and the time 10:20 AM. The main content is as follows:</p><table border="1"><tr><td>Mobile network type</td><td>LTE</td></tr><tr><td>Service state</td><td>In service</td></tr><tr><td>Roaming</td><td>Not roaming</td></tr><tr><td>Mobile data state</td><td>Disconnected</td></tr><tr><td>My phone number</td><td>+1-312-802-0477</td></tr><tr><td>IMEI/SV</td><td>12</td></tr><tr><td>IP address</td><td>Unavailable</td></tr><tr><td>Wi-Fi MAC address</td><td>0C:8F:FF:4B:43:D8</td></tr><tr><td>Bluetooth address</td><td>Unavailable</td></tr><tr><td>Serial number</td><td>JAT7N17803904081</td></tr><tr><td>Up time</td><td>01:18</td></tr></table></div> <div data-bbox="414 252 1209 672"><p>The back view of the phone shows the Cricket logo, a camera lens, and a technical label. The label contains the following information:</p><ul style="list-style-type: none">WARNING: RECHARGEABLE BATTERY. Do not use any liquid on the battery. No fuego ni sustancias corrosivas o la batería.RATED: 3.82V --- 4000mAh(Typ)HAC Rating: W3713HW: HL31R1MDate Code: 20170805IMEI: 864986030218322SKU: DHWNS002<p>At the bottom of the back cover, it says 'Huawei Technologies Co., Ltd. Made in China' and 'Model: JAT7N17803904081'.</p></div>	Mobile network type	LTE	Service state	In service	Roaming	Not roaming	Mobile data state	Disconnected	My phone number	+1-312-802-0477	IMEI/SV	12	IP address	Unavailable	Wi-Fi MAC address	0C:8F:FF:4B:43:D8	Bluetooth address	Unavailable	Serial number	JAT7N17803904081	Up time	01:18
Mobile network type	LTE																						
Service state	In service																						
Roaming	Not roaming																						
Mobile data state	Disconnected																						
My phone number	+1-312-802-0477																						
IMEI/SV	12																						
IP address	Unavailable																						
Wi-Fi MAC address	0C:8F:FF:4B:43:D8																						
Bluetooth address	Unavailable																						
Serial number	JAT7N17803904081																						
Up time	01:18																						

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[i] a display;

The Huawei Elate includes a display.



See <https://www.cricketworkireless.com/content/dam/aio/Support/DeviceSupport/huawei-elate/elate-user-guide.pdf>. last accessed Nov 22, 2018.

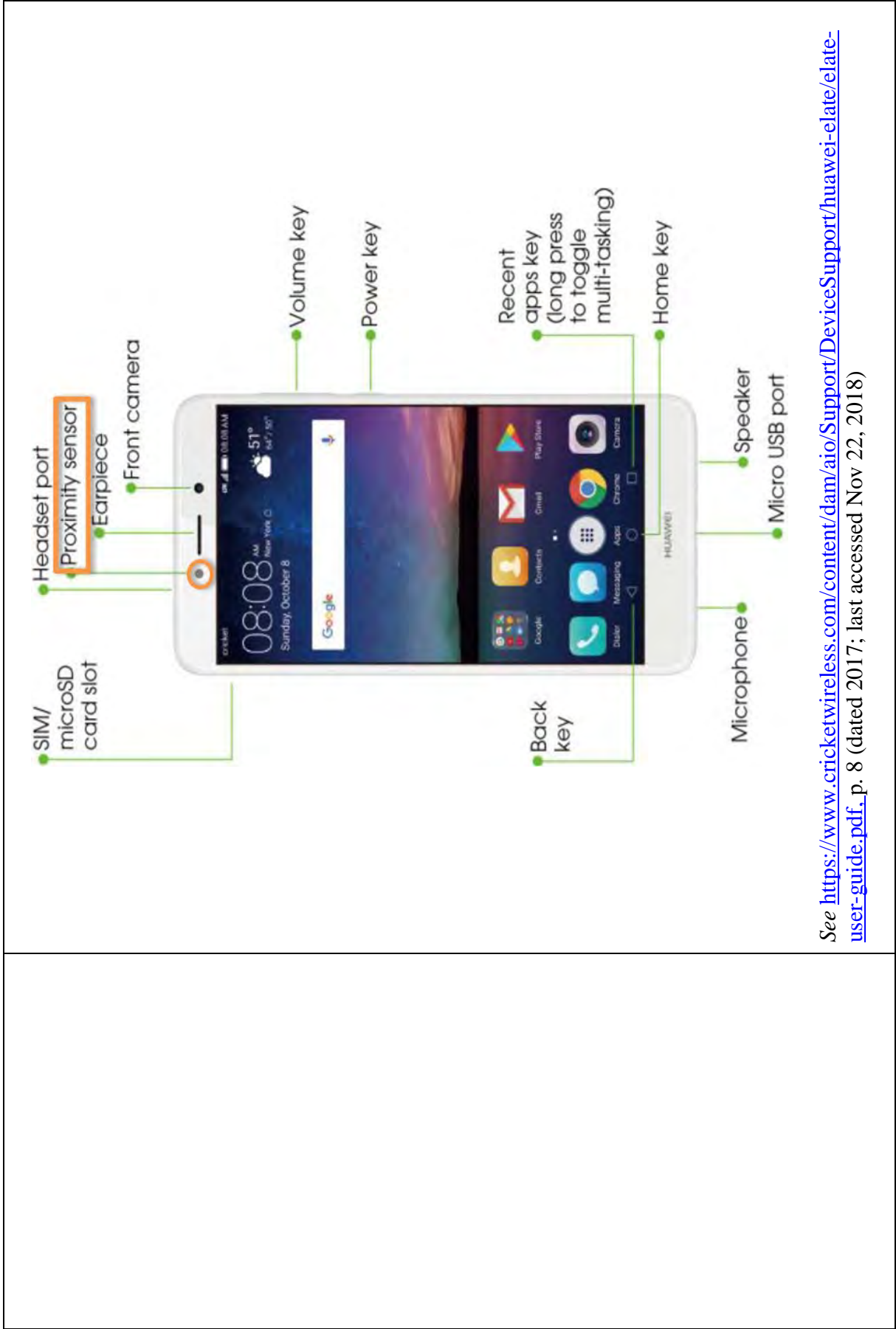
Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

<p>[ii] a proximity sensor</p>	<p>The Huawei Elate includes a proximity sensor.</p>  <p>The diagram shows a front view of a white Huawei Elate smartphone. The screen displays the time 08:08 AM, the date Sunday, October 8, and the weather 51° in New York, NY. The home screen has several app icons: Phone, Messages, App Store, Play Store, Camera, Contacts, Gmail, Chrome, and Photos. The bottom dock contains icons for Phone, Messages, App Store, Play Store, and Camera. The back of the phone is visible, showing the 'HUAWEI' logo and a Micro USB port. Various physical buttons and ports are labeled with green lines pointing to them: SIM/microSD card slot, Headset port, Proximity sensor (highlighted with a red box), Earpiece, Front camera, Volume key, Power key, Back key, Recent apps key (long press to toggle multi-tasking), Home key, Microphone, Speaker, and Micro USB port.</p>
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See <https://www.cricketwireless.com/content/dam/aio/Support/DeviceSupport/huawei-elate/elate-user-guide.pdf>, last accessed Nov 22, 2018.

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-3 –Infringement of U.S. Patent No. 8,204,554



See <https://www.cricetwireless.com/content/dam/aio/Support/DeviceSupport/huawei-elate/elate-user-guide.pdf>, p. 8 (dated 2017; last accessed Nov 22, 2018)

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[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate; and

The proximity sensor of the Huawei Elate is adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate.

By way of example only, the Huawei Elate is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
-----------------------	-----------------	---	--------------------------------------

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.

```
TYPE_PROXIMITY
public static final int TYPE_PROXIMITY
A constant describing a proximity sensor type. This is a wake up sensor.
See SensorEvent.values for more details.
See also:
isWakeUpSensor\(\)
Constant Value: 8 (0x00000008)
```

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

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The referenced discussion concerning the `isWakeUpSensor` file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:

`isWakeUpSensor` added in API level 21

```
public boolean isWakeUpSensor ()
```

Returns true if the sensor is a wake-up sensor.

Application Processor Power modes

`Application Processor(AP)`, is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "suspend" mode, reducing the power consumption by 10 times or more.

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

`SensorManager.registerListener(SensorEventListener, Sensor, int, int)` for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor "to determine how far away a person's head is from the face of a handset device (for example, when a user making or receiving a phone call)."

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<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
--	--

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	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

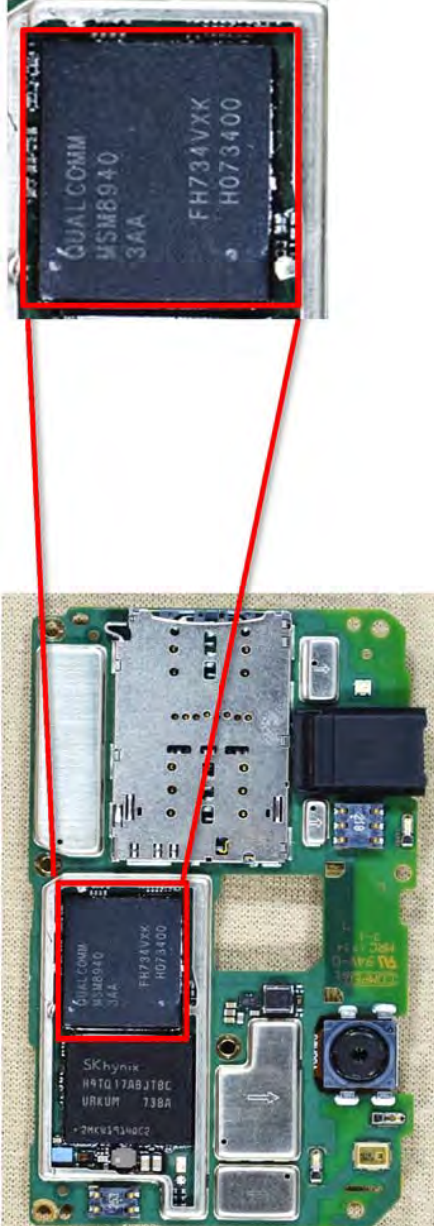
Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

```
override fun onSensorChanged(event: SensorEvent) {  
    val distance = event.values[0]  
    // Do something with this sensor data.  
}  
  
override fun onResume() {  
    // Register a listener for the sensor.  
    super.onResume()  
  
    mProximity?.also { proximity ->  
        mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL)  
    }  
}  
  
override fun onPause() {  
    // Be sure to unregister the sensor when the activity pauses.  
    super.onPause()  
    mSensorManager.unregisterListener(this)  
}
```

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-3 –Infringement of U.S. Patent No. 8,204,554

<p>[iv] a microprocessor adapted to:</p>	<p>The Huawei Elate includes at least one microprocessor.</p>  <p>“Chipset: Qualcomm Snapdragon 435 (MSM8940) Octa-Core (4 x 1.4 GHz+4 x 1.1 GHz) ” See https://consumer.huawei.com/us/phones/elate/specs/ (last accessed Nov 22, 2018)</p>
<p>(a) determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Elate is adapted to determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p>The microprocessor is able to determine when the user initiates an outgoing call or answers an incoming call.</p>

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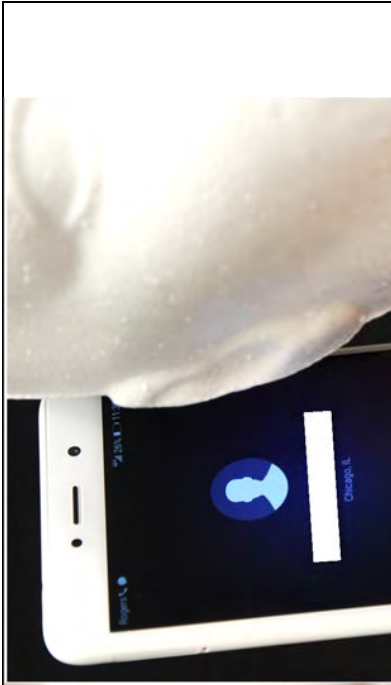

	
<p>By way of example only, the Huawei Elate is an Android phone. The Huawei Elate's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;</p> <p>Outgoing Call:</p>	

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```
/**
 * Broadcast receiver to detect the outgoing calls.
 */
public class OutgoingReceiver extends BroadcastReceiver {
    public OutgoingReceiver() {
    }
    @Override
    public void onReceive(Context context, Intent intent) {
        String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER);
        Toast.makeText(ctx,
            "Outgoing: "+number,
            Toast.LENGTH_LONG).show();
    }
}
```

In the above, the system sends a broadcast action `android.intent.action.NEW_OUTGOING_CALL`.

Incoming Call:

```
/**
 * Listener to detect incoming calls.
 */
private class CallStateListener extends PhoneStateListener {
    @Override
    public void onCallStateChanged(int state, String incomingNumber) {
        switch (state) {
            case TelephonyManager.CALL_STATE_RINGING:
                // called when someone is ringing to this phone
                Toast.makeText(ctx,
                    "Incoming: "+incomingNumber,
                    Toast.LENGTH_LONG).show();
                break;
        }
    }
}
```

In the above, state is the call state, where it may be `CALL_STATE_RINGING`, `CALL_STATE_OFFHOOK`, or `CALL_STATE_IDLE`. Ringing is the state when someone is calling,

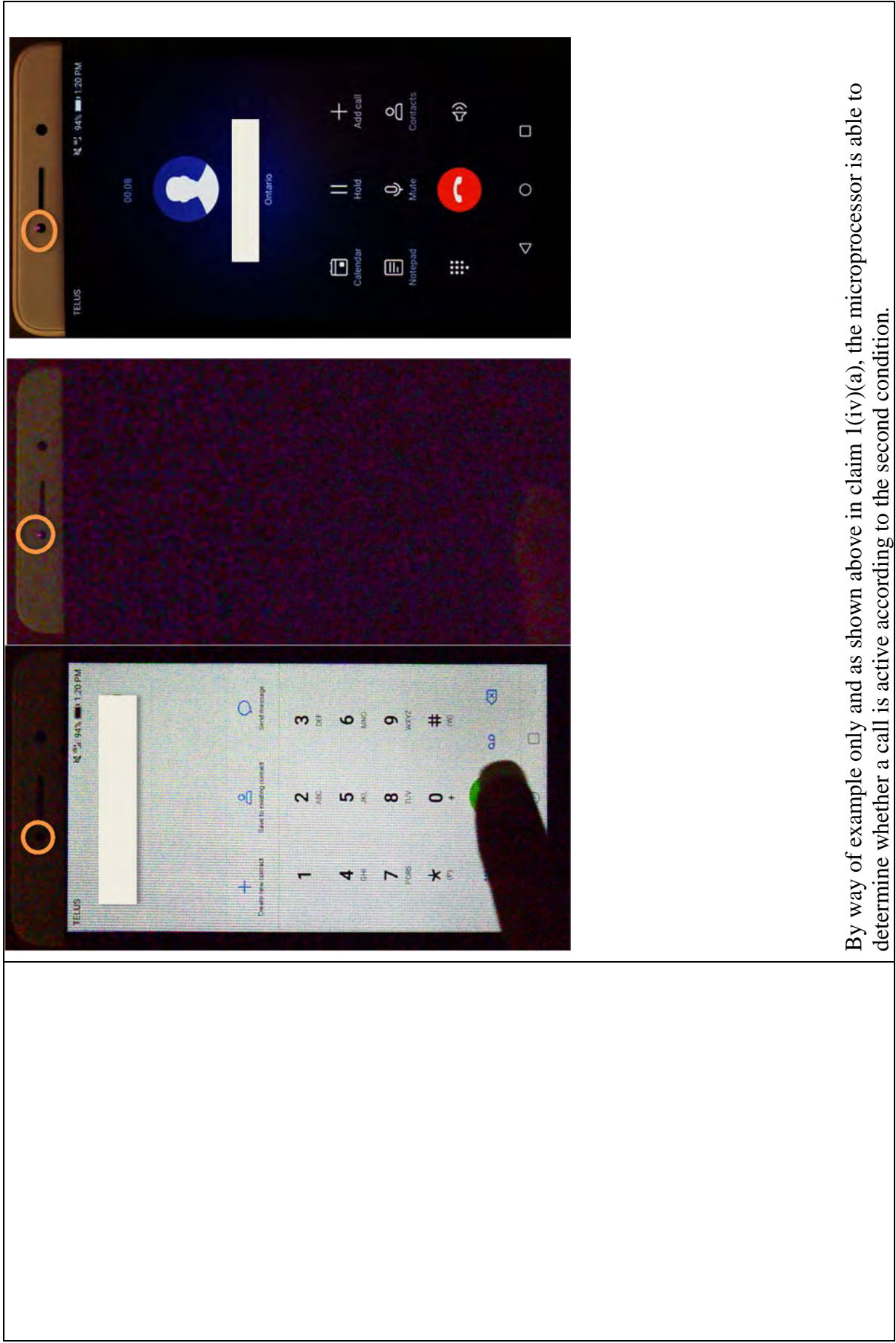
BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

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	<p>offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Elate is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p>

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By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.

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	<p>The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:</p> <p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the <code>isWakeUpSensor</code> file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>
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Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually.</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Elate, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Elate is adapted to receive the signal from the activated proximity sensor.</p> <p>When the call button or answer button is pressed according to the above, the display darkens, indicated that the microprocessor received the signal from the activated proximity sensor that an object was proximate, and, in turn, reduced power to the display.</p>

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	<p>By way of further example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:</p>

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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>
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<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p>	
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(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

The microprocessor of the Huawei Elate is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

By way of example only, the first image shows that the Huawei Elate is proximate to an object, but no call has been initiated or answered, so the display is powered normally.

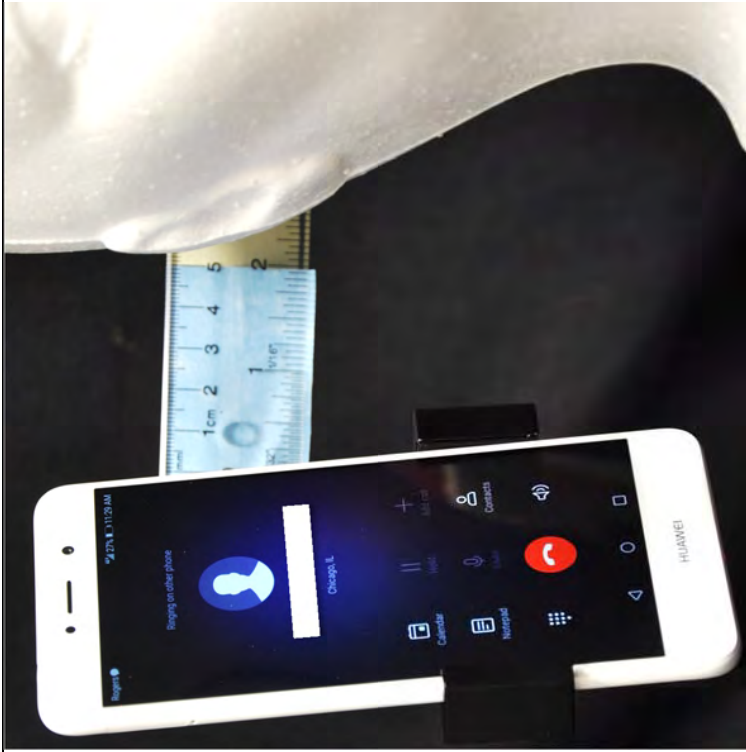


The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Elate, power to the display is reduced and the display is darkened.



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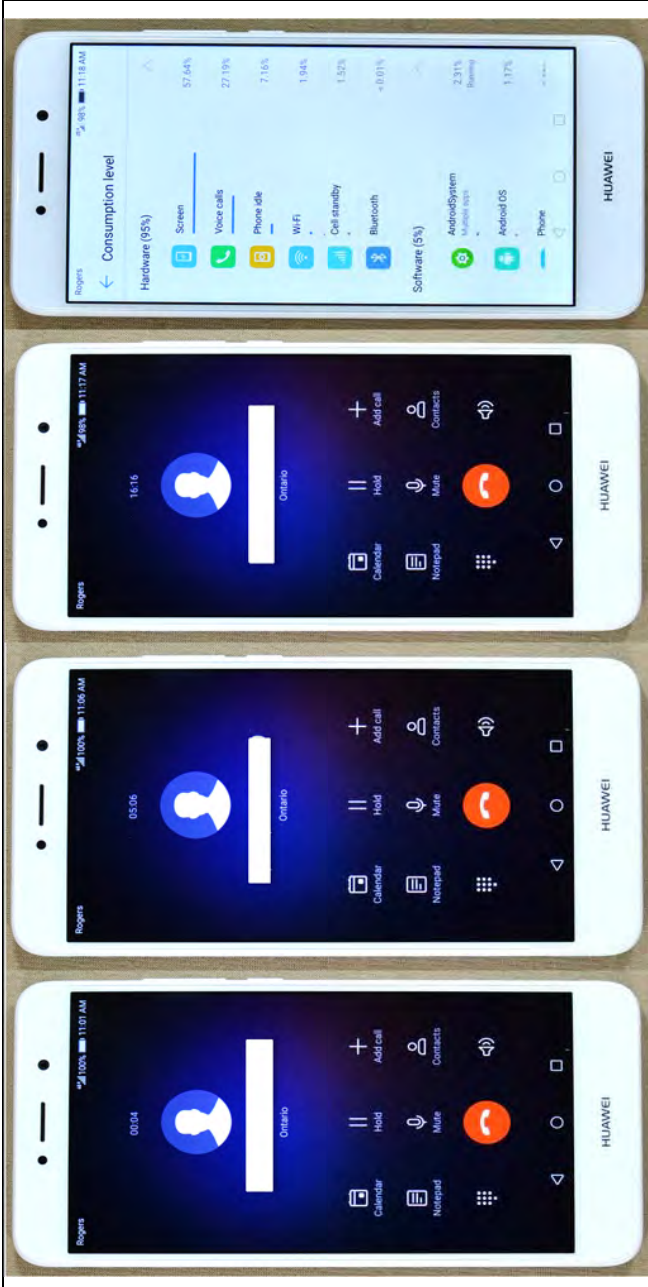
Exhibit B-3 –Infringement of U.S. Patent No. 8,204,554



The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.

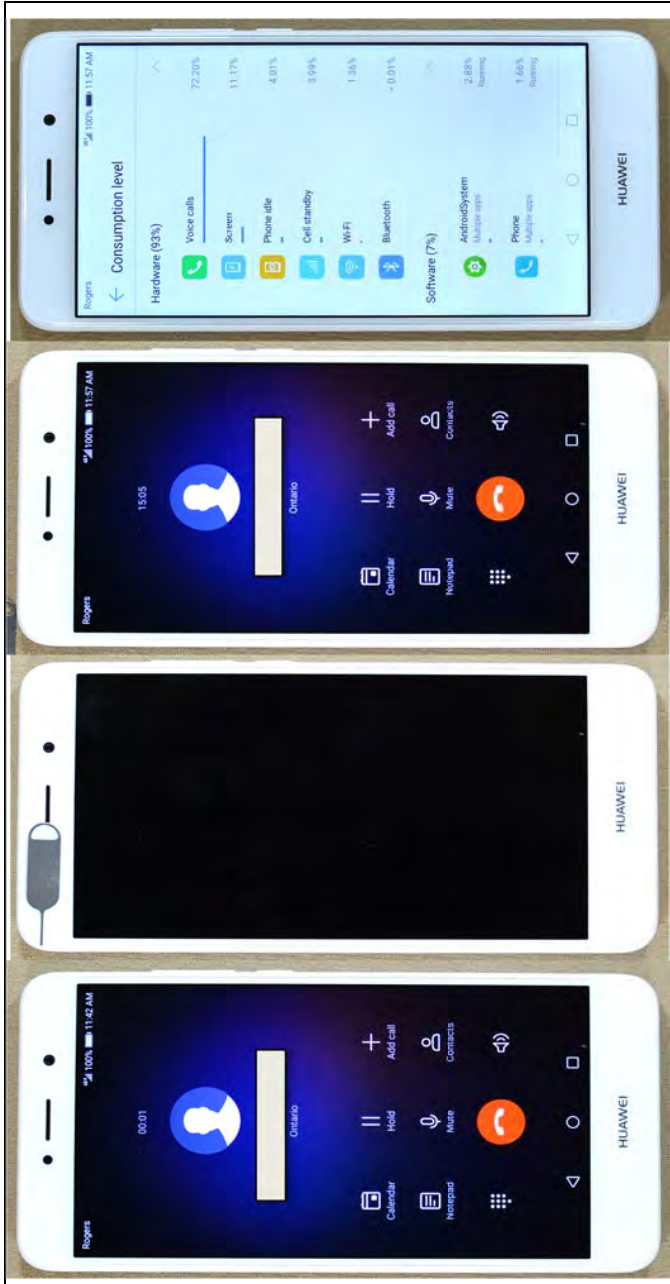
By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally.

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	 <p>When the call begins, the battery starts at a charge of 100%. After the call, the battery is at 98%. The screen consumed 57.64% of the battery consumption.</p> <p>The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.</p>
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When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 11.17% of the battery consumption.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of further example, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:

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	<div><p>TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</p><p>Phone position during a call.</p></div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”</p> <p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <div><pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre></div> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>
--	---

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<pre>KOTLIN JAVA class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	
---	--

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<pre>override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) }</pre>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018</p>
<p>2. The mobile station of claim 1,</p>	<p>See claim 1.</p>

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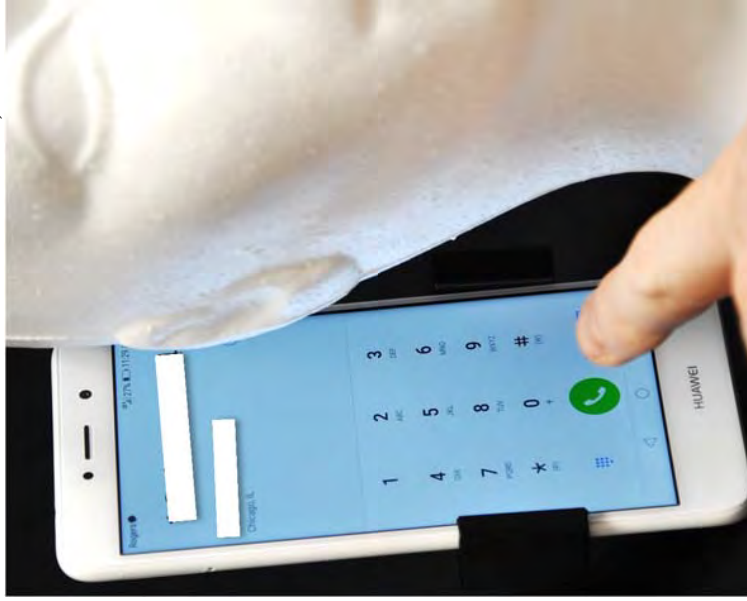
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further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

The microprocessor of the Huawei Elate increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.


By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of example only, the first image shows that the Huawei Elate is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



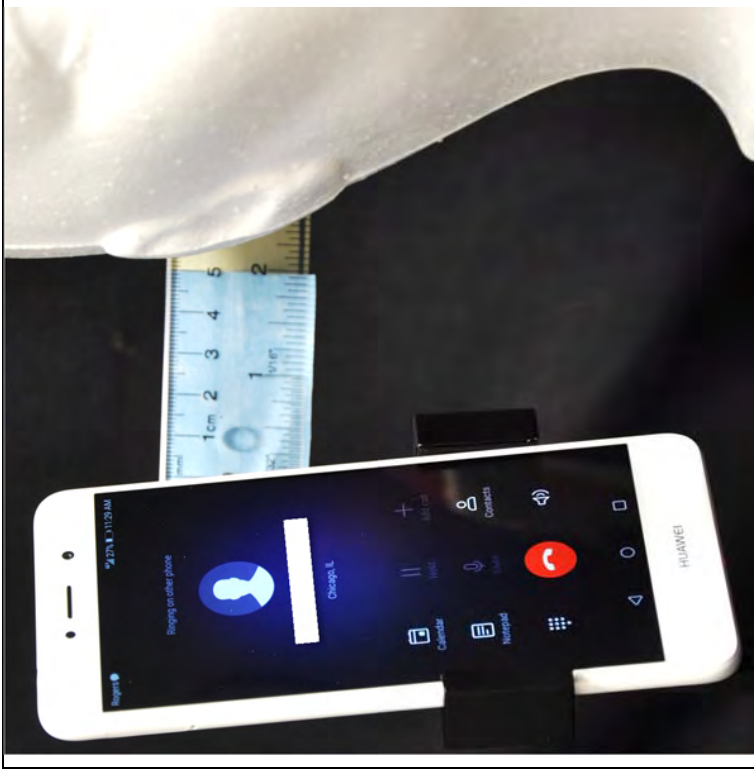
The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Elate, power to the display is reduced and the display is darkened.

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	 <p>The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.</p>
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	 <p>By way of further example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person’s head is from the face of a handset device (for example, when a user is making or receiving a phone call).” <i>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.</i></p>
<p>4. The mobile station as recited in claim 1,</p>	<p><i>See claim 1.</i></p>

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wherein the microprocessor reduces power to the display by turning off the display.


The microprocessor of the Huawei Elate reduces power to the display by turning off the display. When the call button or answer button is pressed and the ear is proximate to the Huawei Elate, power to the display is reduced and the display is turned off.



The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.

By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally.

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When the call begins, the battery starts at a charge of 100%. After the call, the battery is at 98%. The screen consumed 57.64% of the battery consumption.

The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

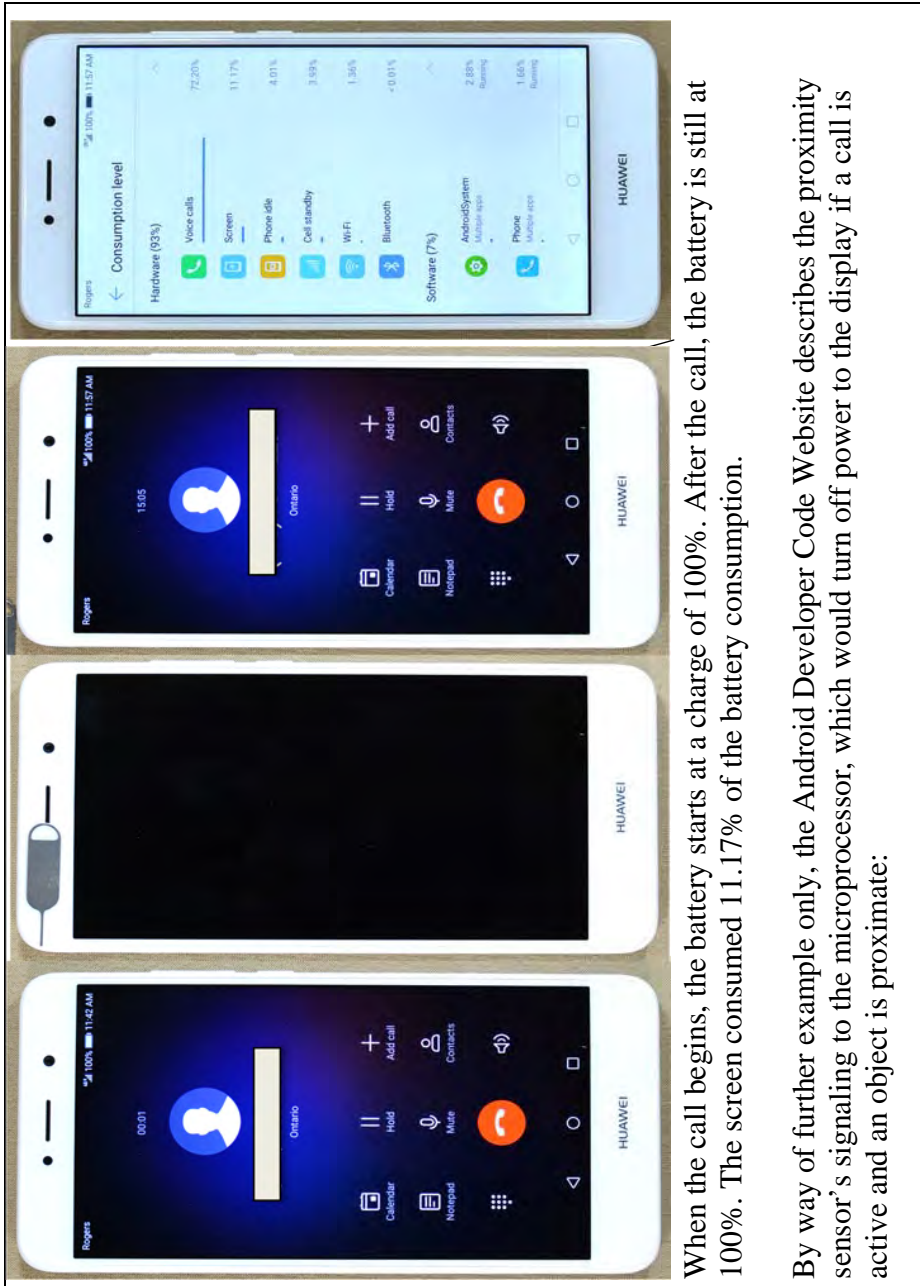
	<p>When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 11.17% of the battery consumption.</p> <p>By way of further example only, the Android Developer Code Website describes the proximity sensor's signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:</p>
---	---

Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x000000008)</p>
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>	<pre>isWakeUpSensor</pre> <p>added in API level 21</p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p>

Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See [SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See [https://developer.android.com/guide/topics/sensors/sensors/sensors/overview](https://developer.android.com/guide/topics/sensors/sensors/sensors/sensors/overview), last accessed November 29, 2018.

Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
--	--

Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Elate is a range-detecting sensor.</p>

Exhibit B-3 –Infringement of U.S. Patent No. 8,204,554

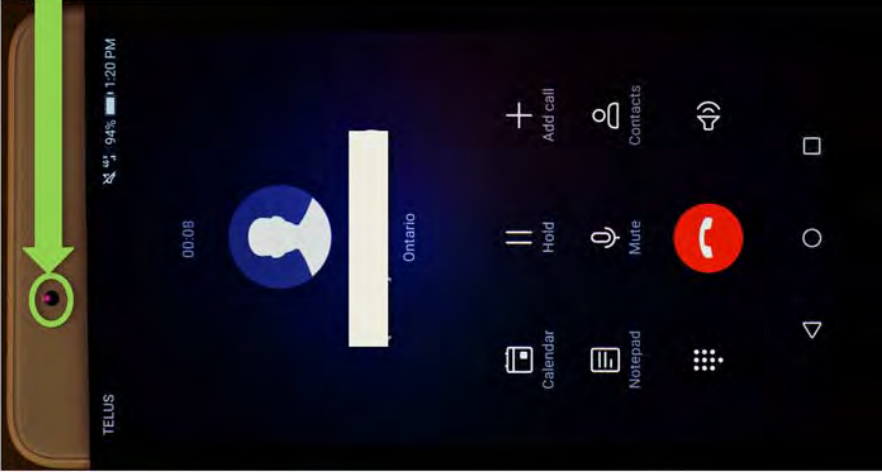
	 <p><i>The optical range sensing proximity sensor emits Inf Red light senses the reflection to determine if external objects are proximate</i></p> <p>The proximity sensor detects the range of a proximate object: By way of example only, when an incoming call is answered, and the device is not proximate to the object, approximately 7 cm from the object the display is on. The mobile station is moved proximate to the ear, approximately 4cm the display is off.</p>
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Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554



By way of further example, the Android Developer Code Website describes range detection in proximity sensors:

TYPE_PROXIMITY

Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.

Phone position during a call.

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

And also, the code shows distance measurement:

Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

<pre>override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. }</pre>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>The Android Developer Code Website further explains:</p> <p>★ Note: Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the <code>getMaximumRange()</code> method.</p> <p>See <i>id.</i></p>
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BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

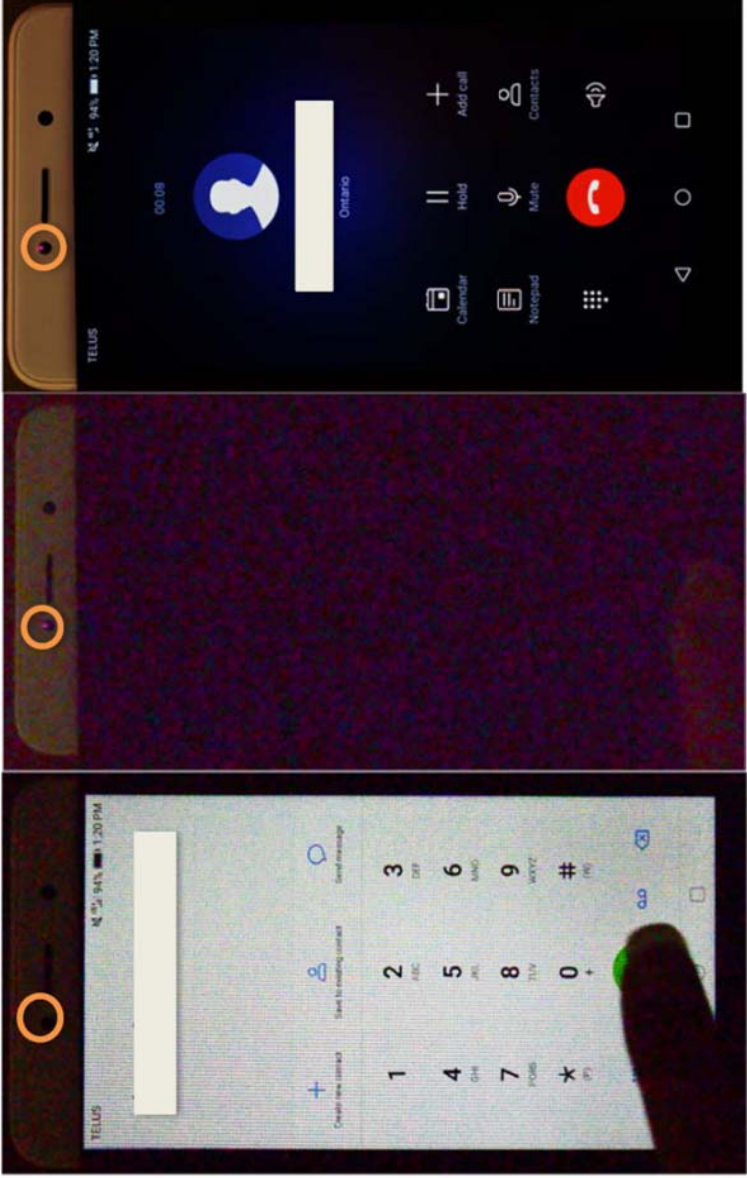
<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The proximity sensor of the Huawei Elate begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p>  <p>The figure consists of three sequential screenshots of a mobile phone dialer interface. In the first screenshot (left), the dial pad is visible with a finger hovering over the '0' key. The proximity sensor area at the top of the screen is dark, indicating it is not activated. In the second screenshot (middle), the call has been initiated, and the proximity sensor area is now highlighted with a red circle, indicating it is activated. In the third screenshot (right), the call is in progress, and the proximity sensor area remains highlighted with a red circle, indicating it stays activated throughout the call.</p>

Exhibit B-3 –Infringement of U.S. Patent No. 8,204,554

In addition, by way of further example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating or receiving a call, including by providing exemplary code at least substantially similar to Huawei code:

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-3 – Infringement of U.S. Patent No. 8,204,554

	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1 (preamble); 1 [ii]-[iii]; 1 (b)-(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call</p>	<p>The Huawei Elate detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being that a</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-3 –Infringement of U.S. Patent No. 8,204,554

<p>condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call;</p>	<p>user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p> <p>See claim 1(a).</p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Elate activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists.</p> <p>See claim 1(b).</p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Elate reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p> <p>See claim 1(c)-(d).</p>
<p>14. A mobile station, comprising:</p>	<p>See claim 1(preamble).</p>
<p>a display;</p>	<p>See claim 1[i].</p>
<p>a proximity sensor</p>	<p>See claim 1[ii].</p>
<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p>See claim 1[iii].</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-3 –Infringement of U.S. Patent No. 8,204,554

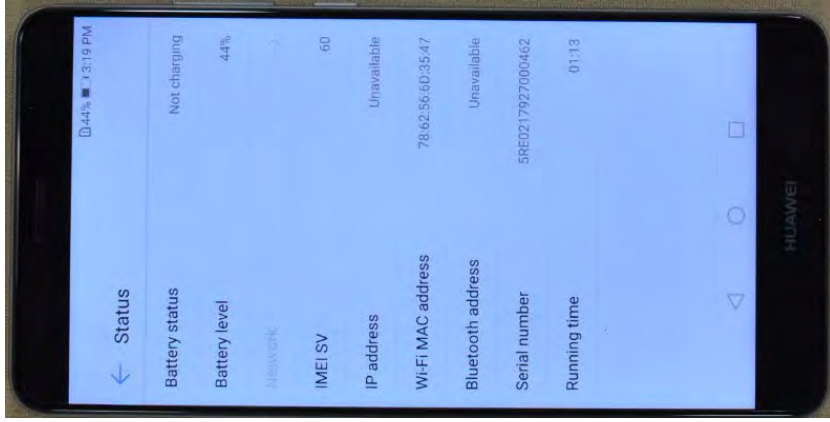
<p>and a microprocessor adapted to:</p> <p>(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>See claim[iv].</p> <p>The microprocessor of the Huawei Elate is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p>See claim 1(a).</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>See claim 1(b).</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>See claim 1(c).</p>
<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p>See claim 1(d).</p>

Asserted Claim Elements

Huawei Mate 9

1. A mobile station, comprising:

To the extent that the preamble is found to be limiting, the Huawei Mate 9 is a mobile station.



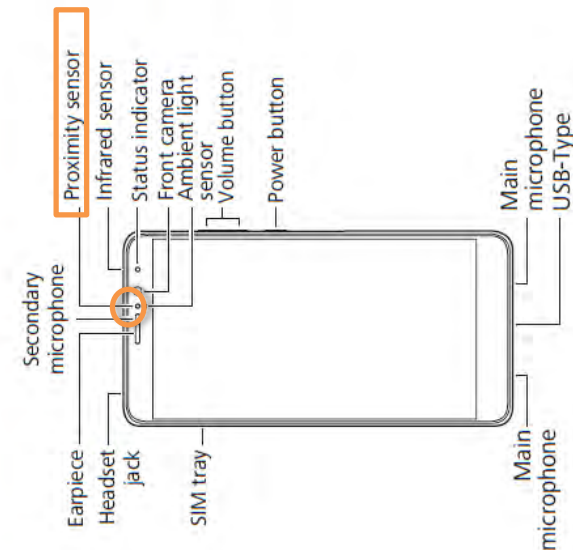
[i] a display;

The Huawei Mate 9 includes a display.



“ Use simple touchscreen gestures to perform a variety of tasks,...”

See http://consumer-tkb.huawei.com/ccpgw/msa/TKB/app_0000000000011227-CcpTKBKnowOut/ctkbknowout/servlet/show/knowAttachmentServlet?knowId=en-us00456784_last accessed Nov.19, 2018.

	<p>The Huawei Mate 9 includes a proximity sensor.</p> <p style="text-align: center;">Getting to know your phone</p>  <p>See http://consumer-tkb.huawei.com/ccpgw/msa/TKB/app_0000000000011227-CcpTKBknowOut/ctkbknowout/servlet/show/knowAttachmentServlet?knowId=en-us00456784 p. 2, last accessed Nov. 19, 2018.</p>	<p>The proximity sensor of the Huawei Mate 9 is adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate.</p> <p>By way of example only, the Huawei Mate 9 is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by</p>
<p>[ii] a proximity sensor</p>		<p>[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate; and</p>

Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
-----------------------	-----------------	---	--------------------------------------

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.

```
TYPE_PROXIMITY
public static final int TYPE_PROXIMITY
A constant describing a proximity sensor type. This is a wake up sensor.
See SensorEvent.values for more details.
See also:
isWakeUpSensor\(\)
Constant Value: 8 (0x00000008)
```

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the `isWakeUpSensor` file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:

<p>isWakeUpSensor</p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor (AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p>	<p>added in API level 21</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor "to determine how far away a person's head is from the face of a handset device (for example, when a user making or receiving a phone call)."</p>
---	---

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

KOTLIN

JAVA

```
class SensorActivity : Activity(), SensorEventListener {  
  
    private lateinit var mSensorManager: SensorManager  
    private var mProximity: Sensor? = null  
  
    public override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.main)  
  
        // Get an instance of the sensor service, and use that to get an instance of  
        // a particular sensor.  
        mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager  
        mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)  
    }  
  
    override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) {  
        // Do something here if sensor accuracy changes.  
    }  
}
```

```

override fun onSensorChanged(event: SensorEvent) {
    val distance = event.values[0]
    // Do something with this sensor data.
}

override fun onResume() {
    // Register a listener for the sensor.
    super.onResume()

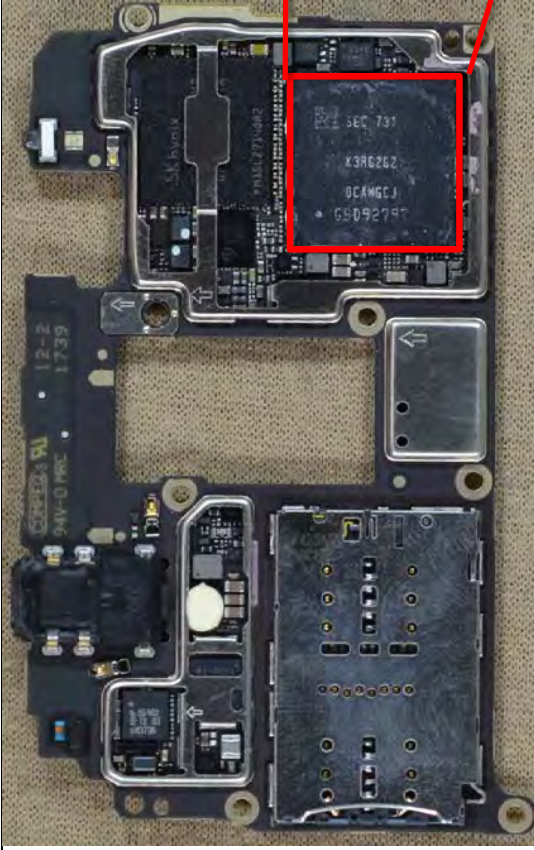
    mProximity?.also { proximity ->
        mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL)
    }
}

override fun onPause() {
    // Be sure to unregister the sensor when the activity pauses.
    super.onPause()
    mSensorManager.unregisterListener(this)
}

```

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.

[iv] a microprocessor adapted to:



The Huawei Mate 9 includes at least one microprocessor.

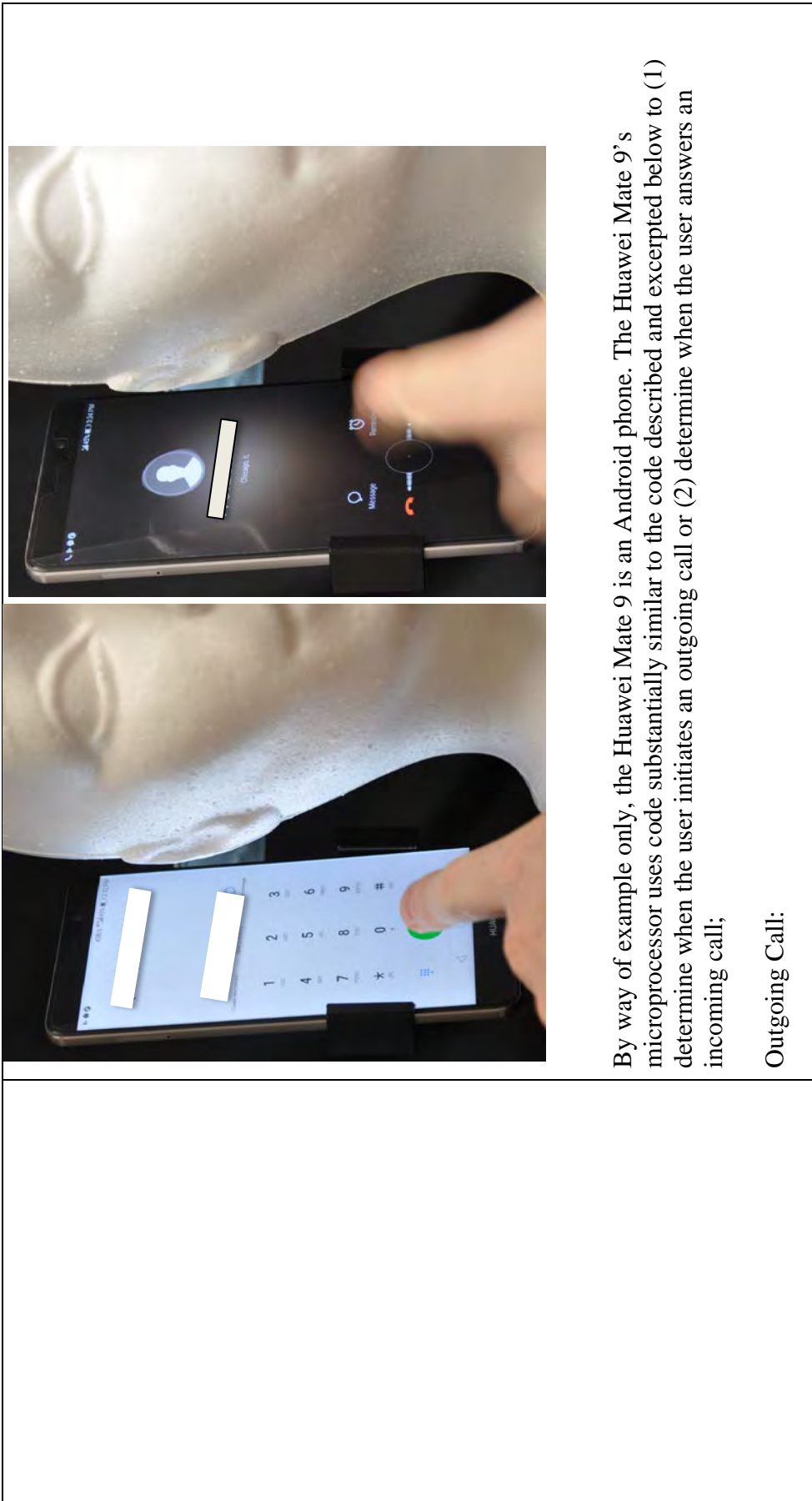
“Chipset: Huawei Kirin 960”

See <https://consumer.huawei.com/us/phones/mate9/specs/>, last accessed Nov. 19, 2018.

(a) determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;

The microprocessor of the Huawei Mate 9 is adapted to determine without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.

The microprocessor is able to determine when the user initiates an outgoing call or answers an incoming call.



By way of example only, the Huawei Mate 9 is an Android phone. The Huawei Mate 9's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;

Outgoing Call:


```

/**
 * Broadcast receiver to detect the outgoing calls.
 */
public class OutgoingReceiver extends BroadcastReceiver {
    public OutgoingReceiver() {
    }

    @Override
    public void onReceive(Context context, Intent intent) {
        String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER);

        Toast.makeText(ctx,
            "Outgoing: "+number,
            Toast.LENGTH_LONG).show();
    }
}

```

In the above, the system sends a broadcast action `android.intent.action.NEW_OUTGOING_CALL`.

Incoming Call:

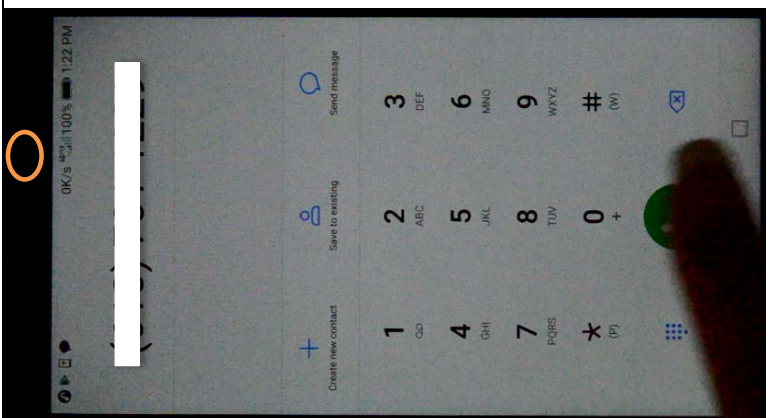
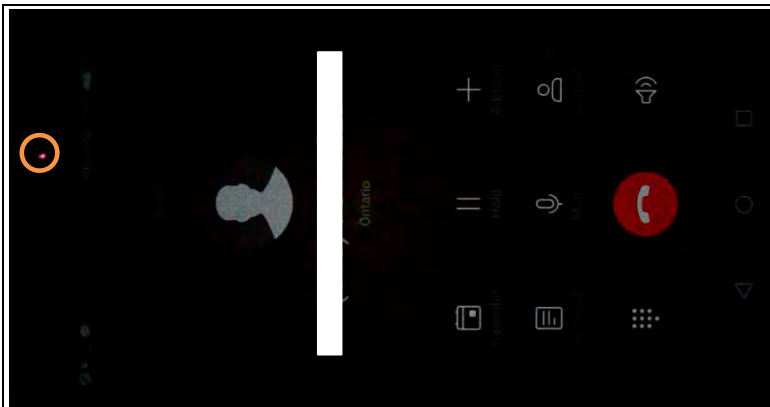
```

/**
 * Listener to detect incoming calls.
 */
private class CallStateListener extends PhoneStateListener {
    @Override
    public void onCallStateChanged(int state, String incomingNumber) {
        switch (state) {
            case TelephonyManager.CALL_STATE_RINGING:
                // called when someone is ringing to this phone
                Toast.makeText(ctx,
                    "Incoming: "+incomingNumber,
                    Toast.LENGTH_LONG).show();
                break;
        }
    }
}

```

In the above, state is the call state, where it may be `CALL_STATE_RINGING`, `CALL_STATE_OFFHOOK`, or `CALL_STATE_IDLE`. Ringing is the state when someone is calling,

	<p>offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Mate 9 is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p>



By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.

The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:

TYPE_PROXIMITY

```
public static final int TYPE_PROXIMITY
```

A constant describing a proximity sensor type. This is a wake up sensor.

See [SensorEvent.values](#) for more details.

See also:

```
isWakeUpSensor\(\)
```

Constant Value: 8 (0x00000008)

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the `isWakeUpSensor` file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:

```
isWakeUpSensor
```

```
public boolean isWakeUpSensor ()
```

Returns true if the sensor is a wake-up sensor.

Application Processor Power modes

Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.

added in API level 21

	<p>See <u>https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()</u>, last accessed November 29, 2018.</p> <p>In the Huawei Mate 9, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Mate 9 is adapted to receive the signal from the activated proximity sensor.</p> <p>When the call button or answer button is pressed according to the above, the display darkens, indicated that the microprocessor received the signal from the activated proximity sensor that an object was proximate, and, in turn, reduced power to the display.</p>



By way of further example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:

TYPE_PROXIMITY

```
public static final int TYPE_PROXIMITY
```

A constant describing a proximity sensor type. This is a wake up sensor.

See [SensorEvent.values](#) for more details.

See also:

```
isWakeUpSensor ()
```

Constant Value: 8 (0x00000008)

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the `isWakeUpSensor` file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:

```
isWakeUpSensor
```

added in API level 21

```
public boolean isWakeUpSensor ()
```

Returns true if the sensor is a wake-up sensor.

Application Processor Power modes

Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

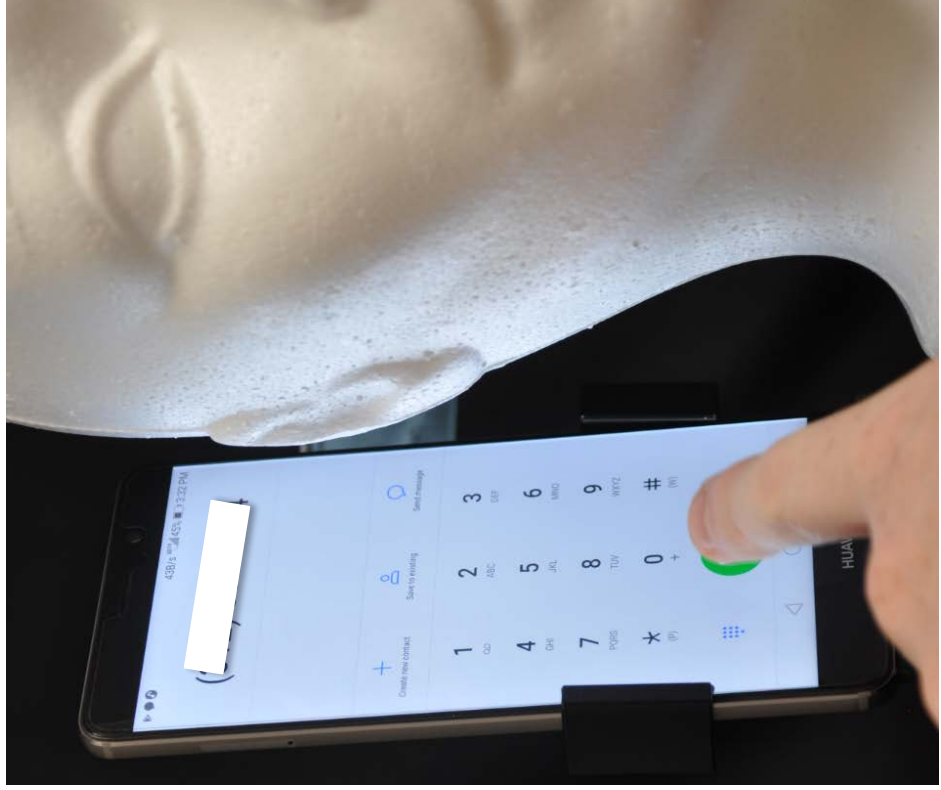
`SensorManager.registerListener(SensorEventListener, Sensor, int, int)` for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

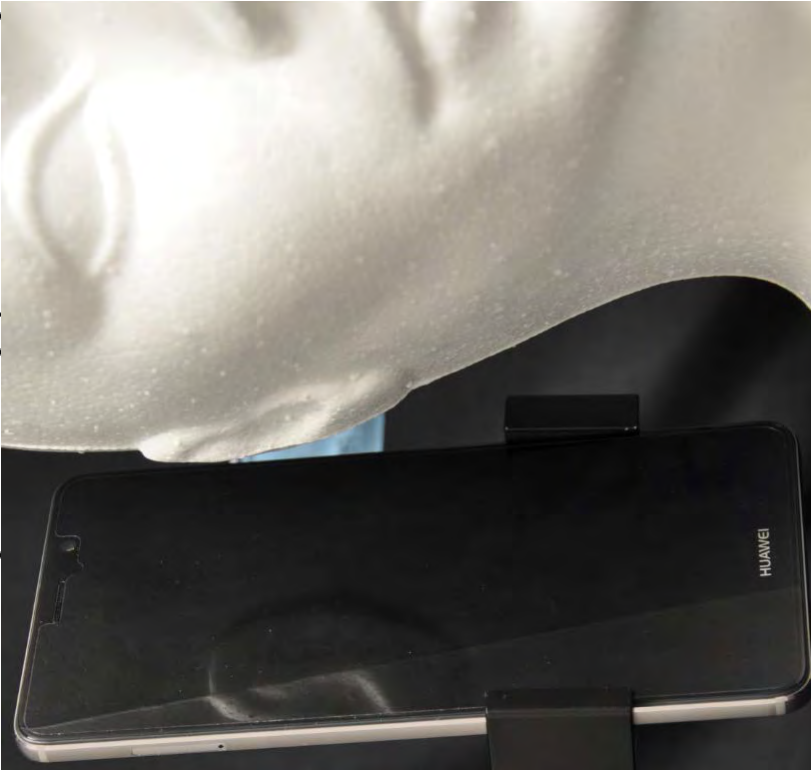
(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

The microprocessor of the Huawei Mate 9 is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

By way of example only, the first image shows that the Huawei Mate 9 is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Mate 9, power to the display is reduced and the display is darkened.

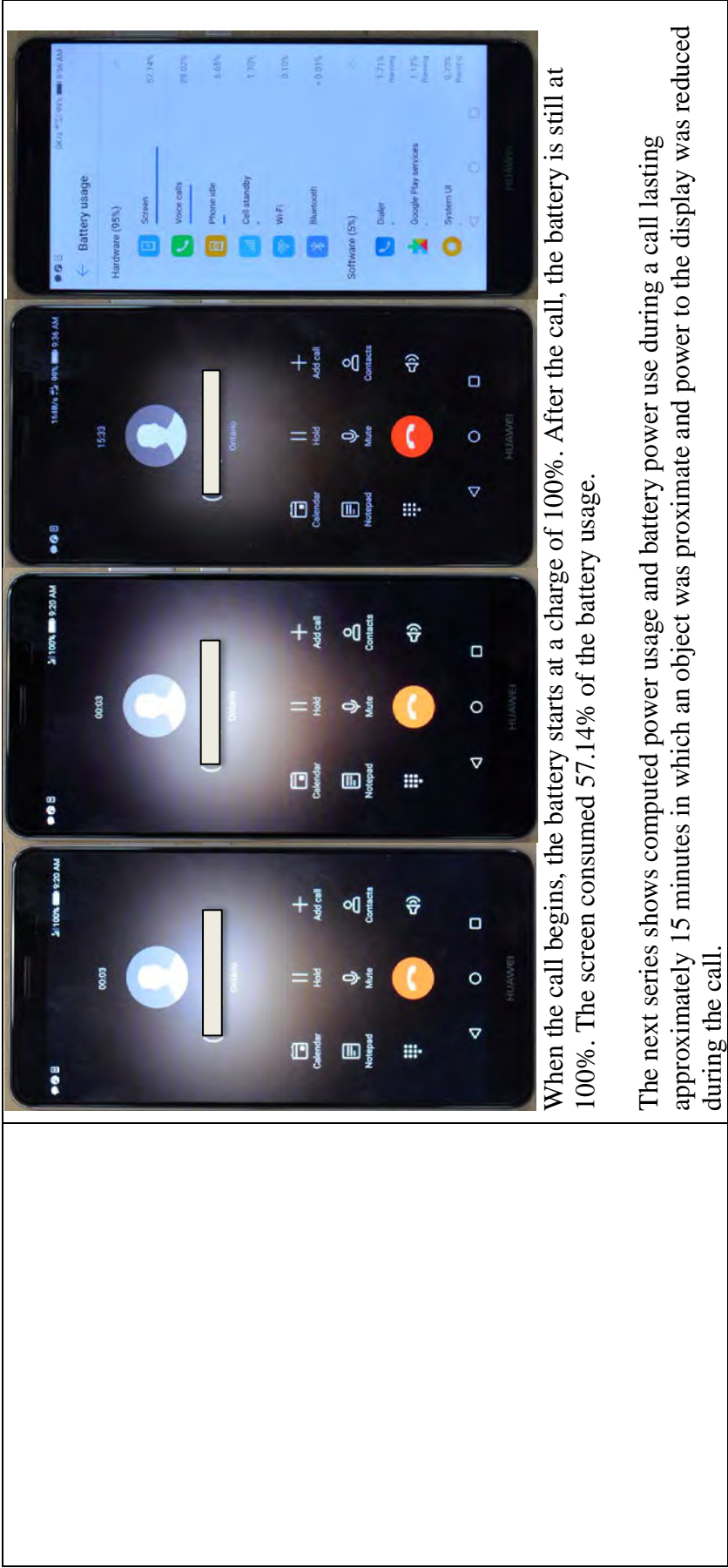


The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.



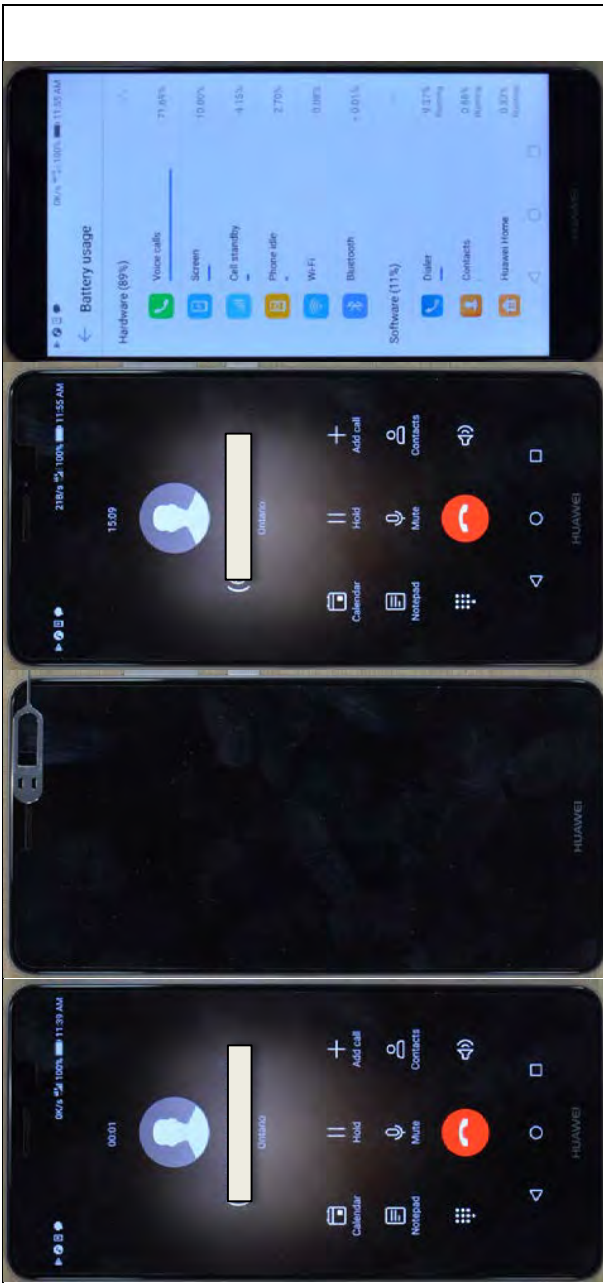
The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.

By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally.



When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 57.14% of the battery usage.

The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.



When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 10.00% of the battery usage.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of further example, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
-----------------------	----------	---	-------------------------------

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person’s head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

KOTLIN

JAVA

```
class SensorActivity : Activity(), SensorEventListener {  
  
    private lateinit var mSensorManager: SensorManager  
    private var mProximity: Sensor? = null  
  
    public override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.main)  
  
        // Get an instance of the sensor service, and use that to get an instance of  
        // a particular sensor.  
        mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager  
        mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)  
    }  
  
    override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) {  
        // Do something here if sensor accuracy changes.  
    }  
}
```

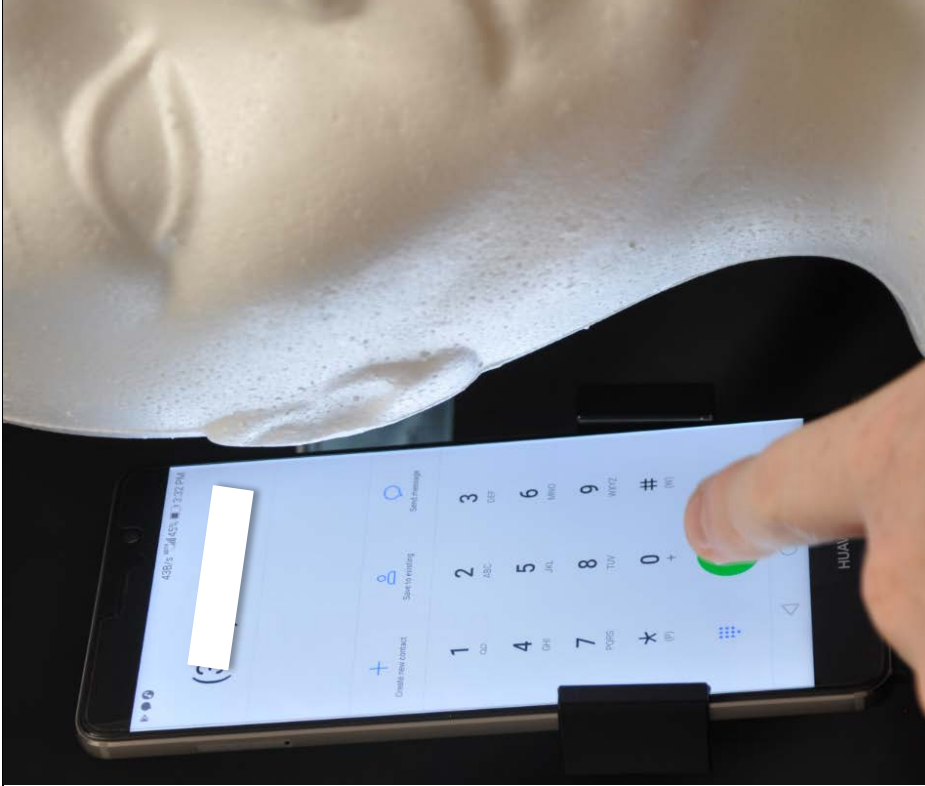
	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018</p>
2. The mobile station of claim 1,	See claim 1.

further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

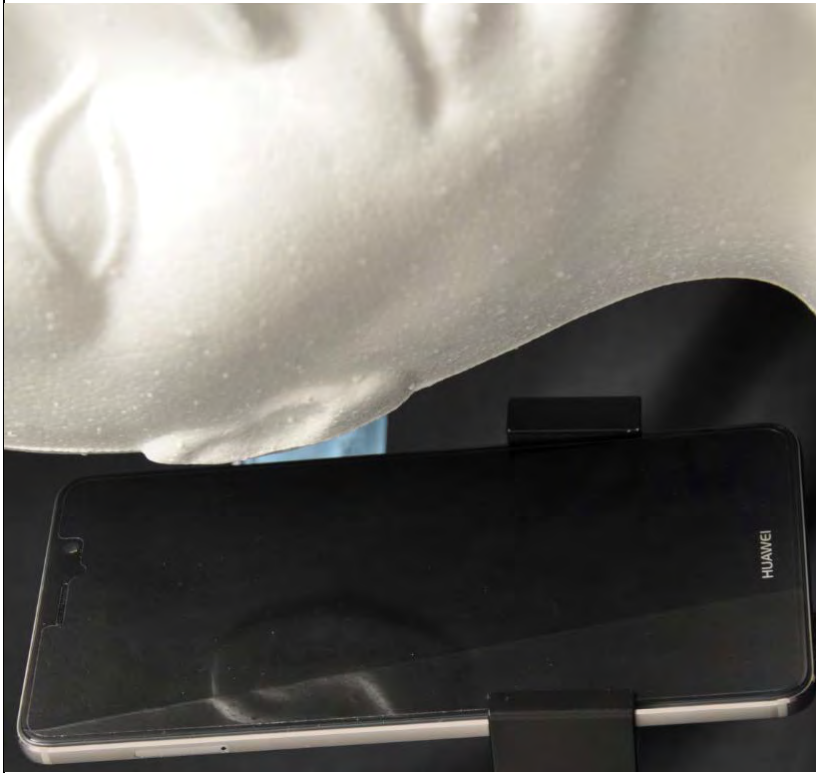
The Huawei Mate 9 increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of example only, the first image shows that the Huawei Mate 9 is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Mate 9, power to the display is reduced and the display is darkened.




The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.

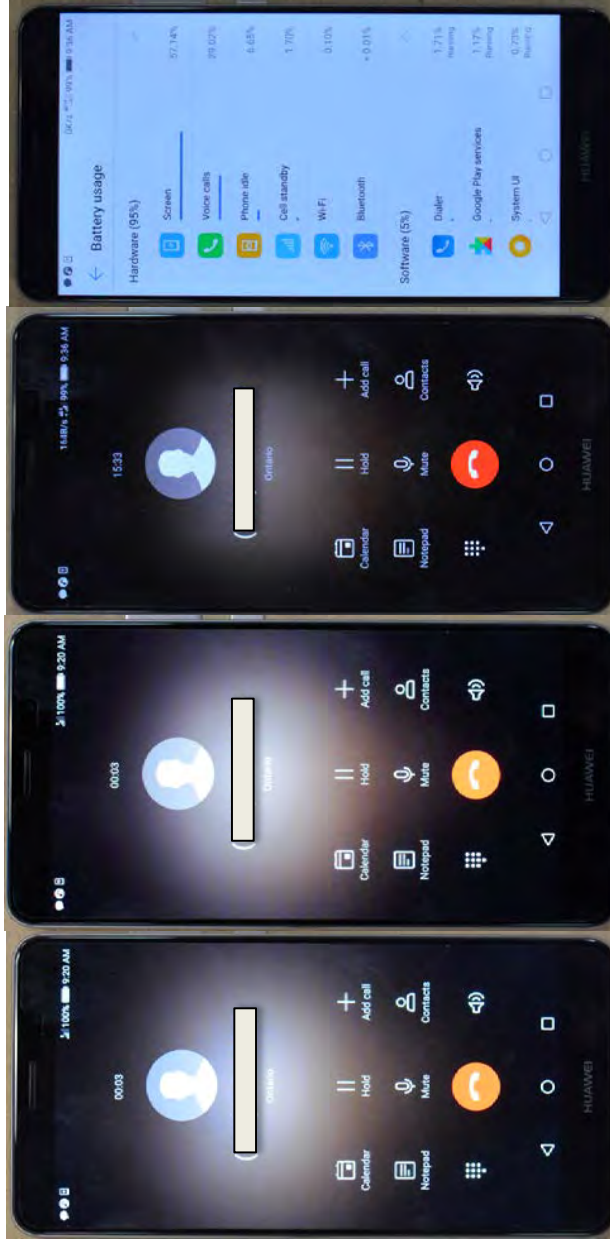


By way of further example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person’s head is from the face of a handset device (for example, when a user is making or receiving a phone call).”

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.

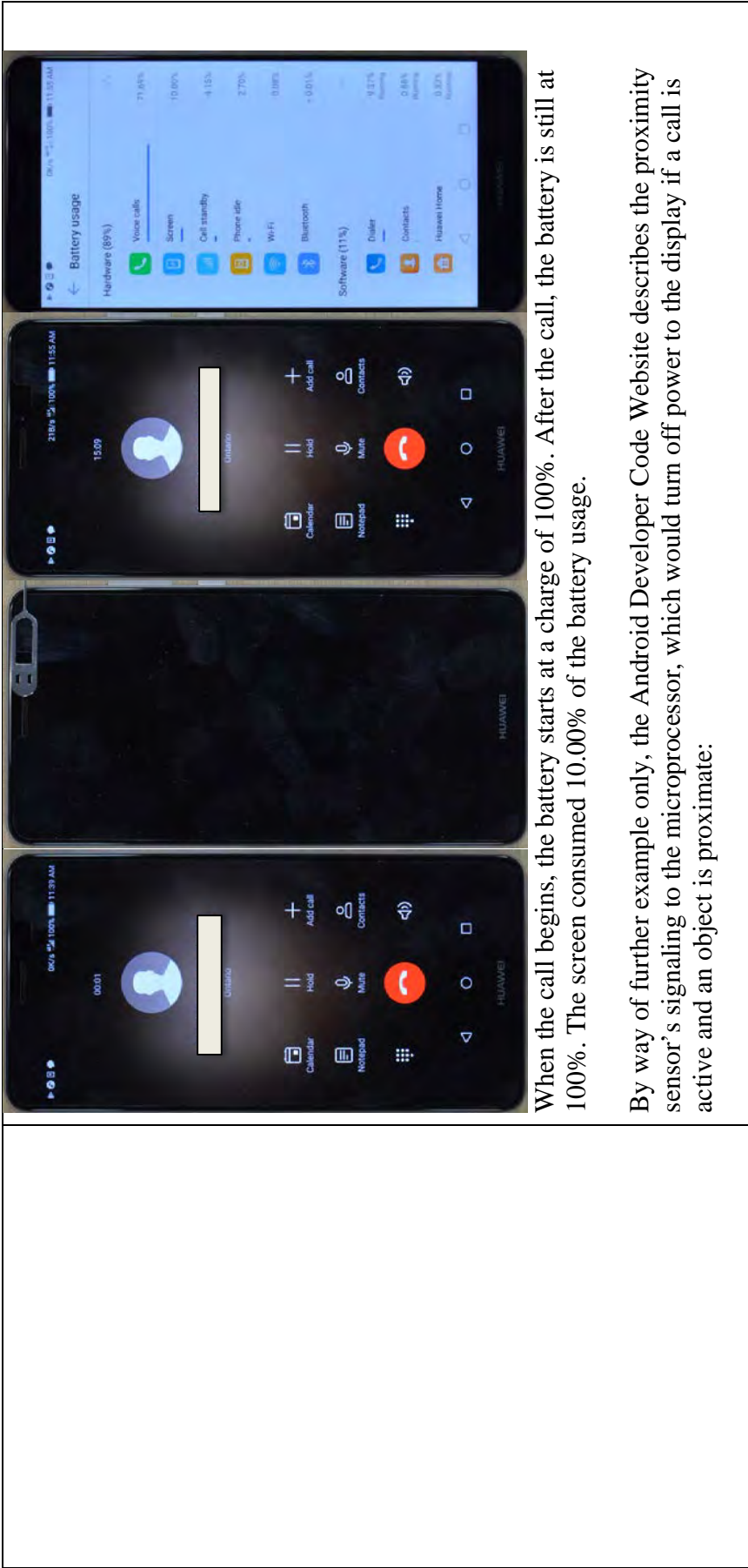
<p>4. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p> <p>The microprocessor of the Huawei Mate 9 reduces power to the display by turning off the display.</p> <p>When the call button or answer button is pressed and the ear is proximate to the Huawei Mate 9, power to the display is reduced and the display is turned off.</p>  <p>The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.</p>
---	--

By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally



When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 57.14% of the battery usage.

The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.



When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 10.00% of the battery usage.

By way of further example only, the Android Developer Code Website describes the proximity sensor's signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:

TYPE_PROXIMITY

```
public static final int TYPE_PROXIMITY
```

A constant describing a proximity sensor type. This is a wake up sensor.

See [SensorEvent.values](#) for more details.

See also:

[isWakeUpSensor\(\)](#)

Constant Value: 8 (0x00000008)

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the `isWakeUpSensor` file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:

```
isWakeUpSensor
```

added in API level 21

```
public boolean isWakeUpSensor ()
```

Returns true if the sensor is a wake-up sensor.

Application Processor Power modes

Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

[SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See <https://developer.android.com/guide/topics/sensors/sensors/overview>, last accessed November 29, 2018.

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

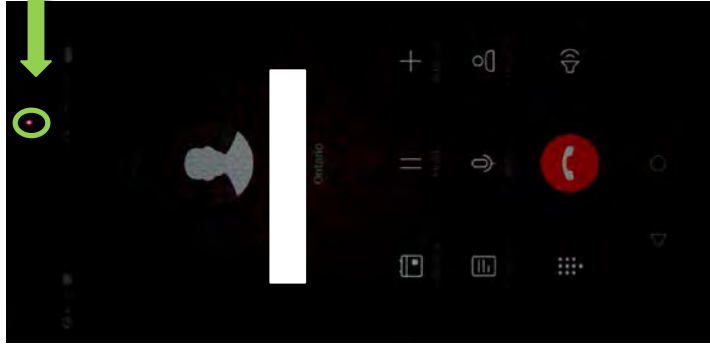
KOTLIN

JAVA

```
class SensorActivity : Activity(), SensorEventListener {  
  
    private lateinit var mSensorManager: SensorManager  
    private var mProximity: Sensor? = null  
  
    public override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.main)  
  
        // Get an instance of the sensor service, and use that to get an instance of  
        // a particular sensor.  
        mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager  
        mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)  
    }  
  
    override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) {  
        // Do something here if sensor accuracy changes.  
    }  
}
```

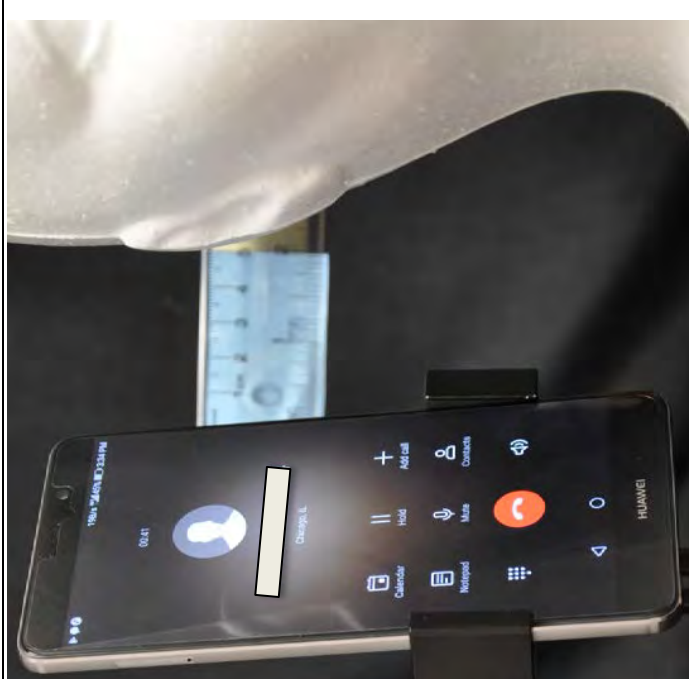
	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Mate 9 is a range-detecting sensor.</p>

The proximity sensor detects the range of a proximate object:



The optical range sensing proximity sensor emits Inf Red light senses the reflection to determine if external objects are proximate

By way of example only, when an incoming call is answered, and the device is not proximate to the object, approximately 7 cm from the object the display is on. The mobile station is moved proximate to the ear, approximately 4cm the display is off.



By way of further example, the Android Developer Code Website describes range detection in proximity sensors:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
-----------------------	-----------------	---	-------------------------------

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

And also, the code shows distance measurement:

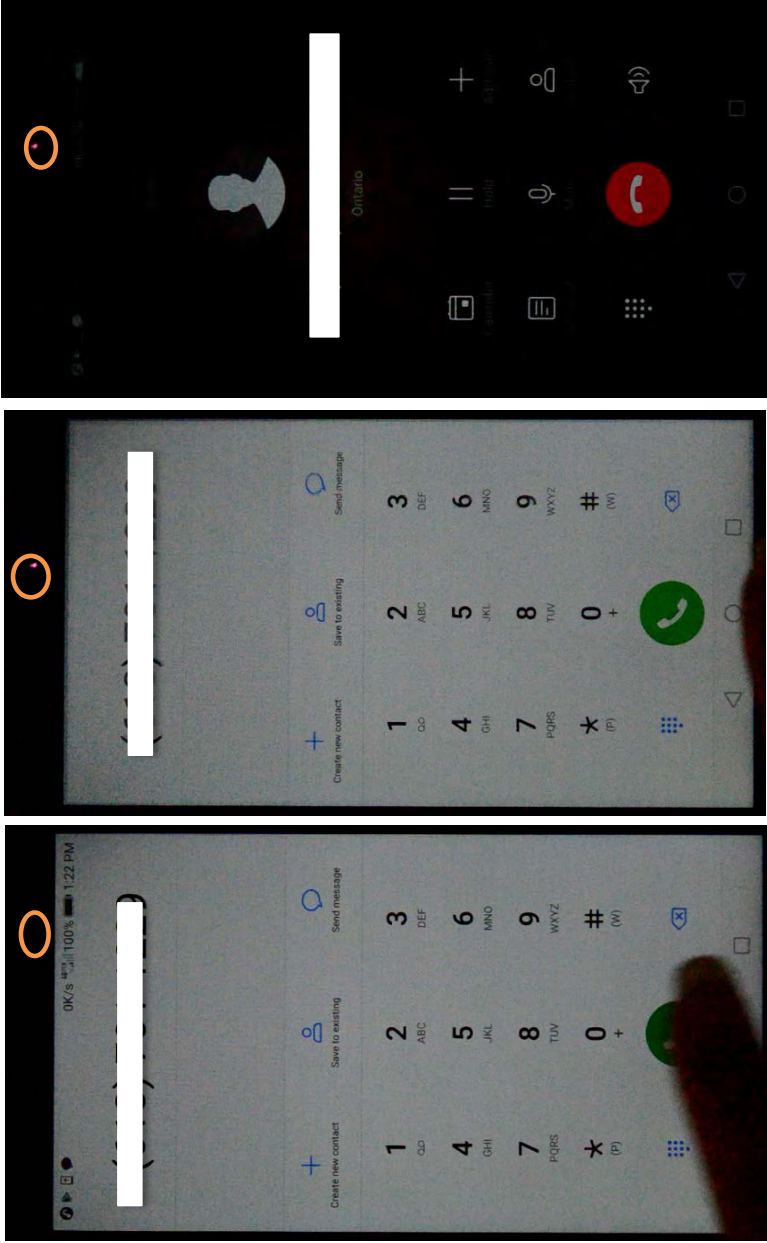
```
override fun onSensorChanged(event: SensorEvent) {  
    val distance = event.values[0]  
    // Do something with this sensor data.  
}
```

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.

The Android Developer Code Website further explains:

★ **Note:** Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the `getMaximumRange()` method.

See id.

<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The proximity sensor of the Huawei Mate 9 begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p> 

In addition, by way of further example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating or receiving a call, including by providing exemplary code at least substantially similar to Huawei code:

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

KOTLIN

JAVA

```
class SensorActivity : Activity(), SensorEventListener {  
  
    private lateinit var mSensorManager: SensorManager  
    private var mProximity: Sensor? = null  
  
    public override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.main)  
  
        // Get an instance of the sensor service, and use that to get an instance of  
        // a particular sensor.  
        mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager  
        mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)  
    }  
  
    override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) {  
        // Do something here if sensor accuracy changes.  
    }  
}
```

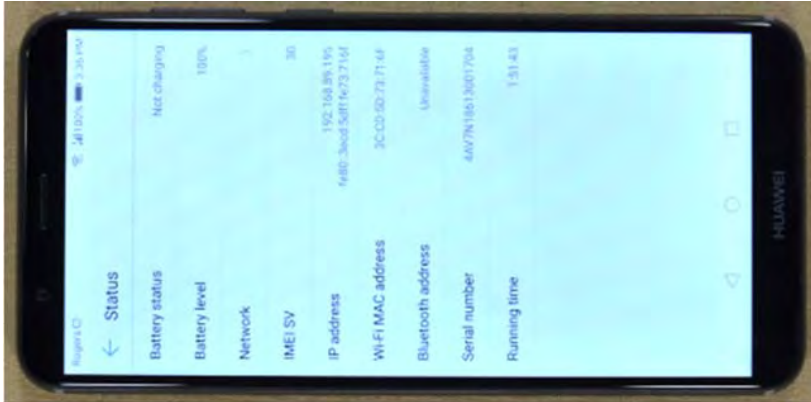
	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1 (preamble); 1 [ii]- [iii]; 1 (b)-(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call condition independent and different</p>	<p>The Huawei Mate 9 detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p>

<p>from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call;</p>	<p>See claim 1(a).</p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Mate 9 activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists. See claim 1(b).</p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Mate 9 reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists. See claim 1(c)-(d).</p>
<p>14. A mobile station, comprising:</p>	<p>See claim 1(preamble).</p>
<p>a display;</p>	<p>See claim 1[i].</p>
<p>a proximity sensor</p>	<p>See claim 1[ii].</p>
<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p>See claim 1[iii].</p>
<p>and a microprocessor adapted to:</p>	<p>See claim[iv].</p>

<p>(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Mate 9 is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p><i>See claim 1(a).</i></p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p><i>See claim 1(b).</i></p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p><i>See claim 1(c).</i></p>
<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p><i>See claim 1(d).</i></p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-5 –Infringement of U.S. Patent No. 8,204,554

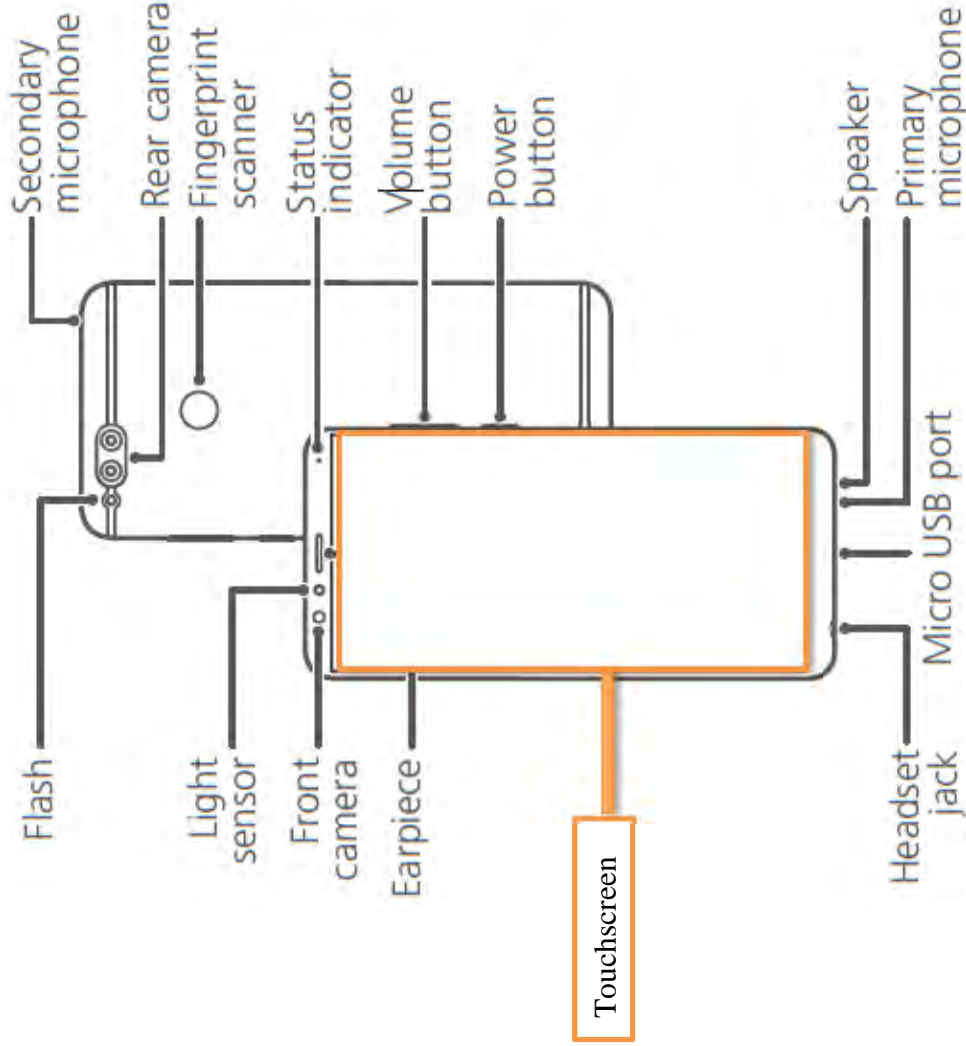
Asserted Claim Elements	Huawei Mate SE																				
<p>1. A mobile station, comprising:</p>	<p>To the extent that the preamble is found to be limiting, the Huawei Mate SE is a mobile station.</p> <div><p>The screenshot shows the 'Status' page of a Huawei Mate SE. The status bar at the top indicates 4G LTE, 100% battery, and 10:34 AM. The main content area lists the following information:</p><table border="1"><tr><td>Battery status</td><td>Not charging</td></tr><tr><td>Battery level</td><td>100%</td></tr><tr><td>Network</td><td>3G</td></tr><tr><td>IMEI/SV</td><td>192 10426 145</td></tr><tr><td>IP address</td><td>192.168.20.145</td></tr><tr><td>WiFi MAC address</td><td>480-3a0d-5817-63-215d</td></tr><tr><td>Bluetooth address</td><td>3C02-5D-73-71-6F</td></tr><tr><td>Serial number</td><td>Unavailable</td></tr><tr><td>Running time</td><td>46/7N 18013607704</td></tr><tr><td></td><td>1:51:43</td></tr></table></div> <div><p>The image shows the back of a silver Huawei Mate SE smartphone. It features a circular camera lens with a flash, a fingerprint sensor, and the Huawei logo. Two white labels are visible on the back: one with the IMEI number 19210426145 and another with the serial number 4607N18013607704.</p></div>	Battery status	Not charging	Battery level	100%	Network	3G	IMEI/SV	192 10426 145	IP address	192.168.20.145	WiFi MAC address	480-3a0d-5817-63-215d	Bluetooth address	3C02-5D-73-71-6F	Serial number	Unavailable	Running time	46/7N 18013607704		1:51:43
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	1:51:43																				

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-5 –Infringement of U.S. Patent No. 8,204,554

[i] a display;

The Huawei Mate SE includes a display.



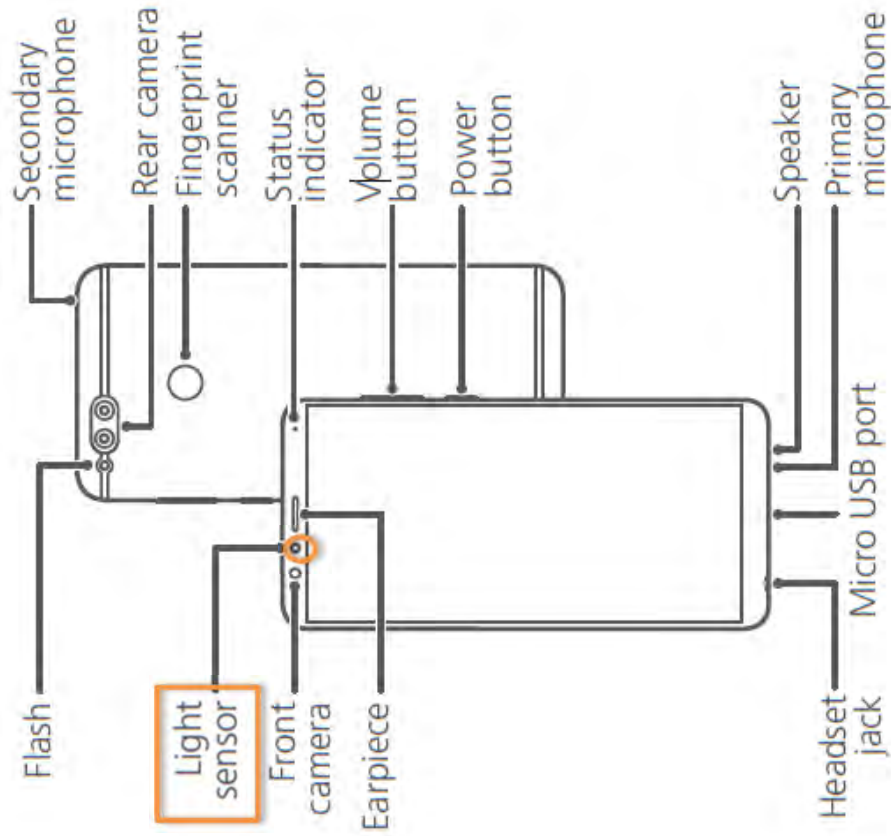
See http://consumer-ikb.huawei.com/ccpgw/msa/TKB/app_0000000000011227-CcpTKBknowOut/ctkbknowout/servlet/show/knowAttachmentServlet?knowId=en-us00423632 p. 1, last accessed Nov 22, 2018.

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

[ii] a proximity sensor

The Huawei Mate SE includes a proximity sensor.



See http://consumer-ikb.huawei.com/ccpgw/msa/TKB/app_0000000000011227-CcpTKBKnowOut/ctkbknowout/servlet/show/knowAttachmentServlet?knowId=en-us00423632, last accessed Nov 22, 2018.

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-5 –Infringement of U.S. Patent No. 8,204,554

[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate; and

The proximity sensor of the Huawei Mate SE is adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate.

By way of example only, the Huawei Mate SE is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
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See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.

```
TYPE_PROXIMITY
public static final int TYPE_PROXIMITY
A constant describing a proximity sensor type. This is a wake up sensor.
See SensorEvent.values for more details.
See also:
isWakeUpSensor\(\)
Constant Value: 8 (0x00000008)
```

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

The referenced discussion concerning the isWakeUpSensor file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:

isWakeUpSensor added in API level 21

public boolean isWakeUpSensor ()

Returns true if the sensor is a wake-up sensor.

Application Processor Power modes

Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "suspend" mode, reducing the power consumption by 10 times or more.

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent, maxFifoEventCount() == 0, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's onPause method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

[SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor "to determine how far away a person's head is from the face of a handset device (for example, when a user making or receiving a phone call)."

Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

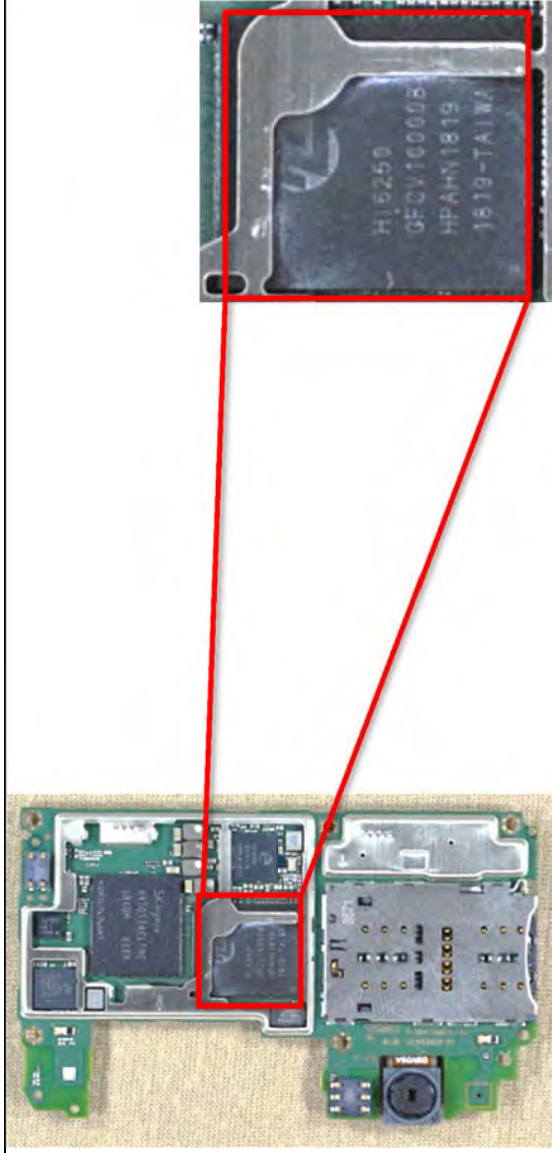
<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>	<p>[iv] a microprocessor adapted to:</p> <p>The Huawei Mate SE includes at least one microprocessor.</p>
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	 <p>“Chipset: Kirin 659, Octa-Core (4 x 2.36 GHz+4 x 1.7 GHz)” See https://consumer.huawei.com/us/phones/mate-se/specs/ (last accessed Nov 22, 2018)</p>
<p>(a) determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Mate SE is adapted to determine without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p>The microprocessor is able to determine when the user initiates an outgoing call or answers an incoming call.</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

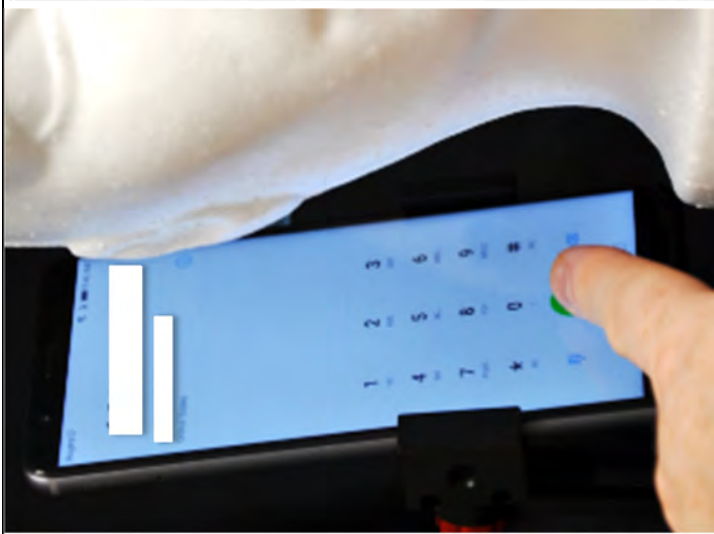
	
<p>By way of example only, the Huawei Mate SE is an Android phone. The Huawei Mate SE's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;</p> <p>Outgoing Call:</p>	

Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

```
/**
 * Broadcast receiver to detect the outgoing calls.
 */
public class OutgoingReceiver extends BroadcastReceiver {
    public OutgoingReceiver() {
    }
    @Override
    public void onReceive(Context context, Intent intent) {
        String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER);
        Toast.makeText(ctx,
            "Outgoing: "+number,
            Toast.LENGTH_LONG).show();
    }
}
```

In the above, the system sends a broadcast action `android.intent.action.NEW_OUTGOING_CALL`.

Incoming Call:

```
/**
 * Listener to detect incoming calls.
 */
private class CallStateListener extends PhoneStateListener {
    @Override
    public void onCallStateChanged(int state, String incomingNumber) {
        switch (state) {
            case TelephonyManager.CALL_STATE_RINGING:
                // called when someone is ringing to this phone
                Toast.makeText(ctx,
                    "Incoming: "+incomingNumber,
                    Toast.LENGTH_LONG).show();
                break;
        }
    }
}
```

In the above, state is the call state, where it may be `CALL_STATE_RINGING`, `CALL_STATE_OFFHOOK`, or `CALL_STATE_IDLE`. Ringing is the state when someone is calling,

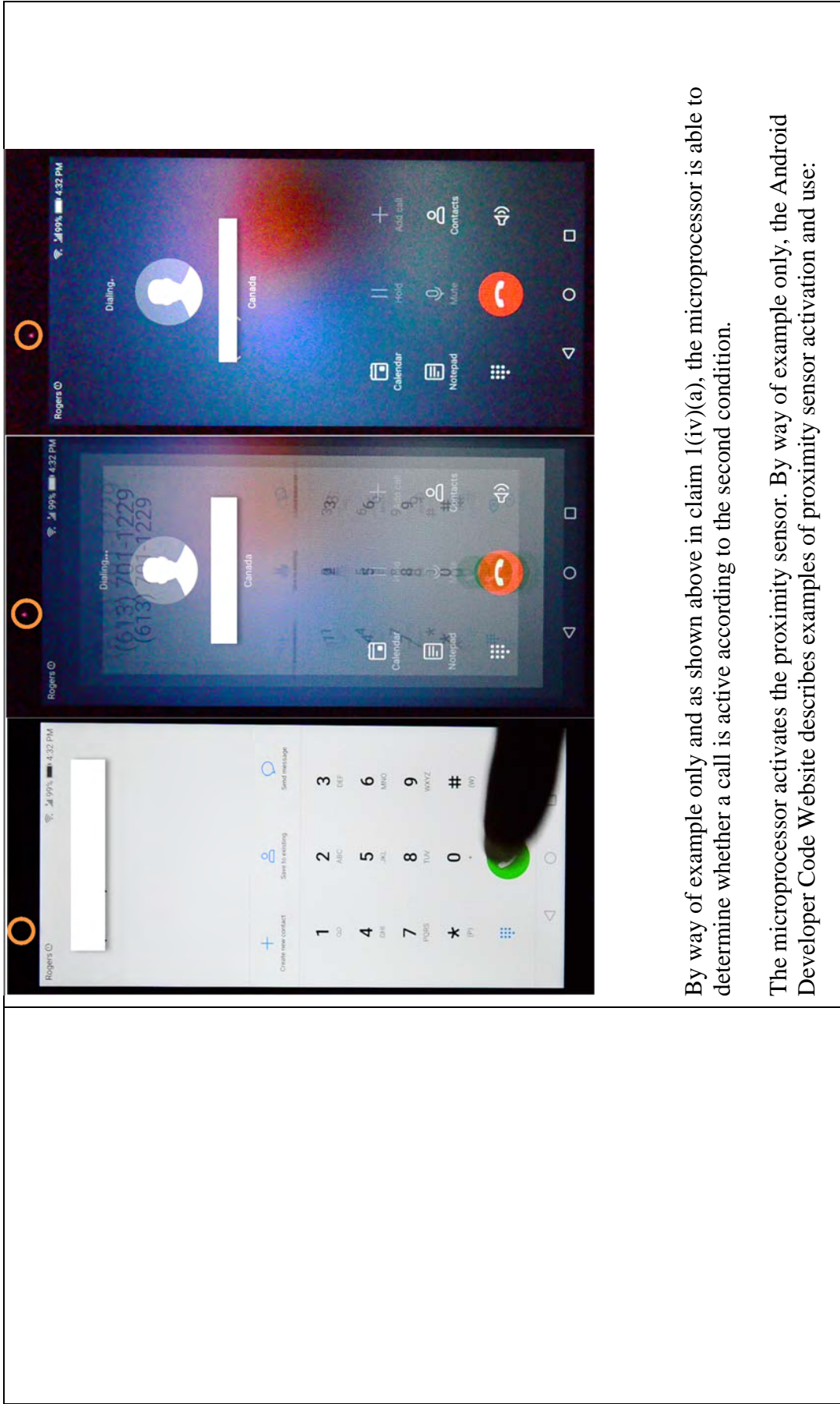
BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

	<p>offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Mate SE is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p>

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By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.

The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:

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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>	<pre>isWakeUpSensor</pre> <p>added in API level 21</p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p>
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Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually.</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See <code>SensorManager.registerListener(SensorEventListener, Sensor, int, int)</code> for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Mate SE, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Mate SE is adapted to receive the signal from the activated proximity sensor.</p> <p>When the call button or answer button is pressed according to the above, the display darkens, indicated that the microprocessor received the signal from the activated proximity sensor that an object was proximate, and, in turn, reduced power to the display.</p>

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Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

	
<p>By way of further example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:</p>	

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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>	<pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor. Application Processor Power modes Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</pre> <p>added in API level 21</p>

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<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p>	
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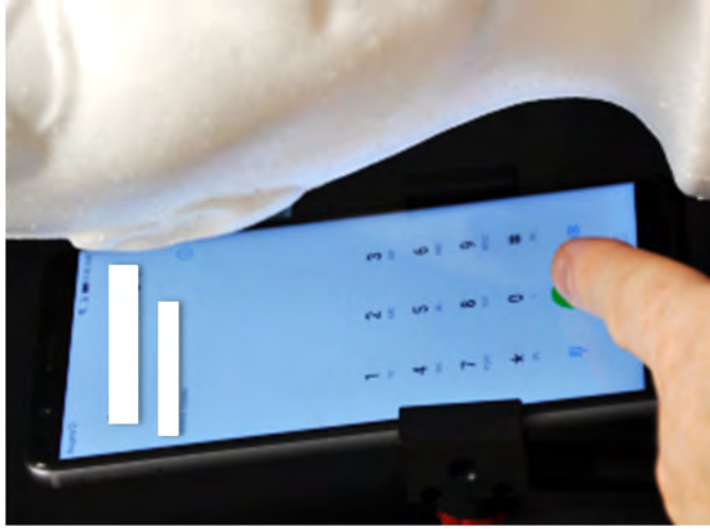
BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

The microprocessor of the Huawei Mate SE is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

By way of example only, the first image shows that the Huawei Mate SE is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Mate SE, power to the display is reduced and the display is darkened.

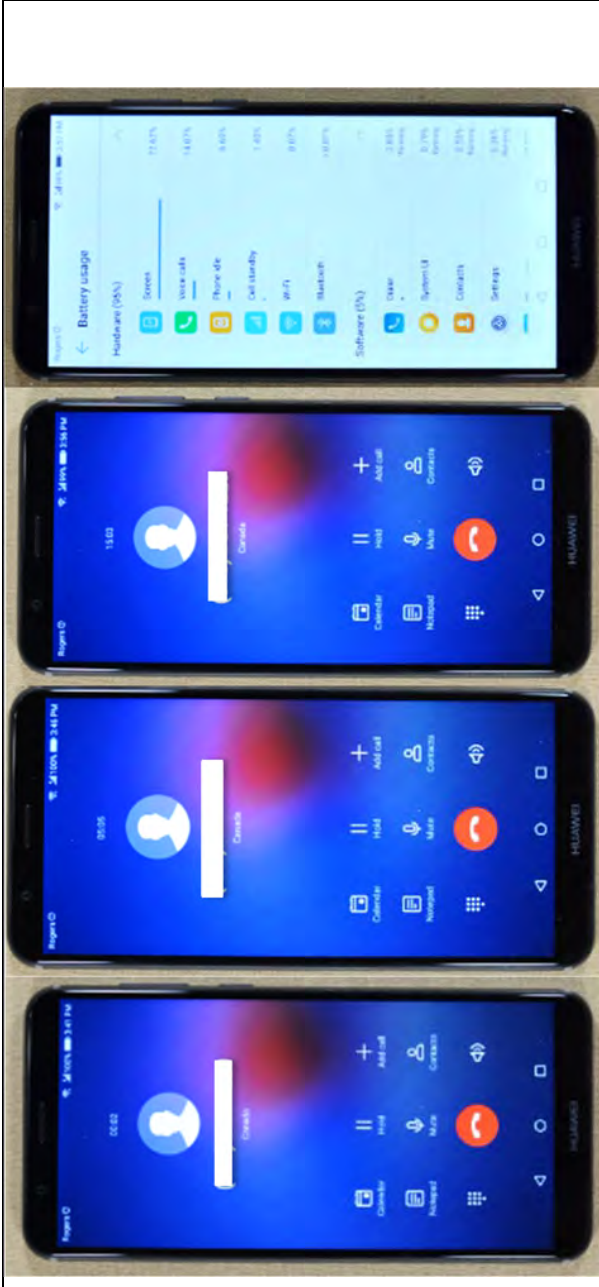
	 <p>The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.</p>
--	---



The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.

By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally.

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	 <p>When the call begins, the battery starts at a charge of 100%. After the call, the battery is at 99%.</p> <p>The screen consumed 72.62% of the battery.</p> <p>The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.</p>
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When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 20.13% of the battery.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of further example, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
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See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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	<pre>KOTLIN JAVA class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>
--	---

Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018</p>
<p>2. The mobile station of claim 1,</p>	<p>See claim 1.</p>

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Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

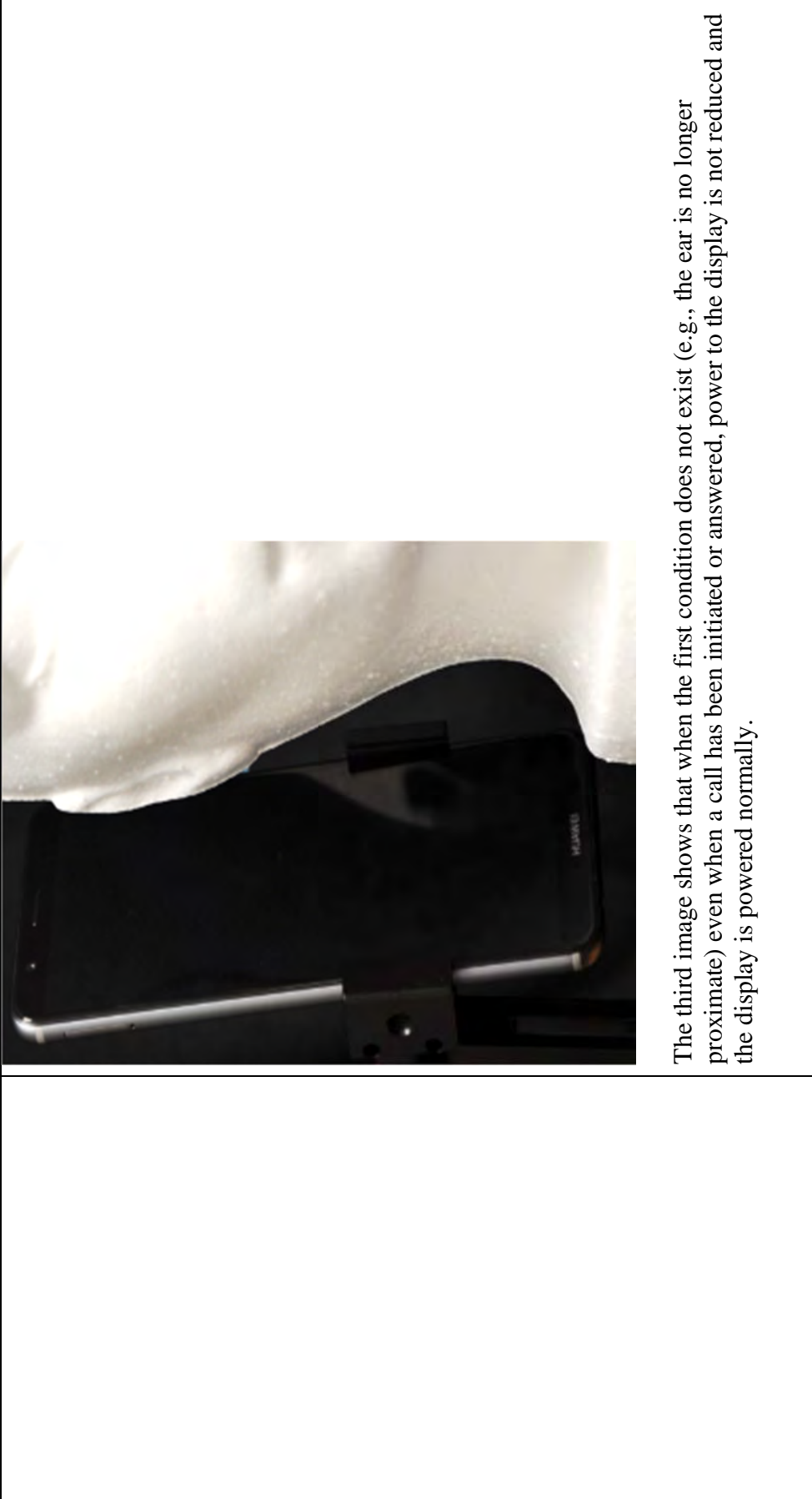
The microprocessor of the Huawei Mate SE increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of example only, the first image shows that the Huawei Mate SE is proximate to an object, but no call has been initiated or answered, so the display is powered normally.




The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Mate SE, power to the display is reduced and the display is darkened.



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	 <p>By way of further example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person’s head is from the face of a handset device (for example, when a user is making or receiving a phone call).”</p> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.</p>
<p>4. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>

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wherein the microprocessor reduces power to the display by turning off the display.

The microprocessor of the Huawei Mate SE reduces power to the display by turning off the display.

When the call button or answer button is pressed and the ear is proximate to the Huawei Mate SE, power to the display is reduced and the display is turned off.



The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.

By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally

Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554



When the call begins, the battery starts at a charge of 100%. After the call, the battery is at 99%. The screen consumed 72.62% of the battery.

The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.

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Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554


 <p>When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 100%. The screen consumed 20.13% of the battery.</p> <p>By way of further example only, the Android Developer Code Website describes the proximity sensor's signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:</p>	
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Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x000000008)</p>	<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>
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Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See [SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See <https://developer.android.com/guide/topics/sensors/sensors/overview>, last accessed November 29, 2018.

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<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

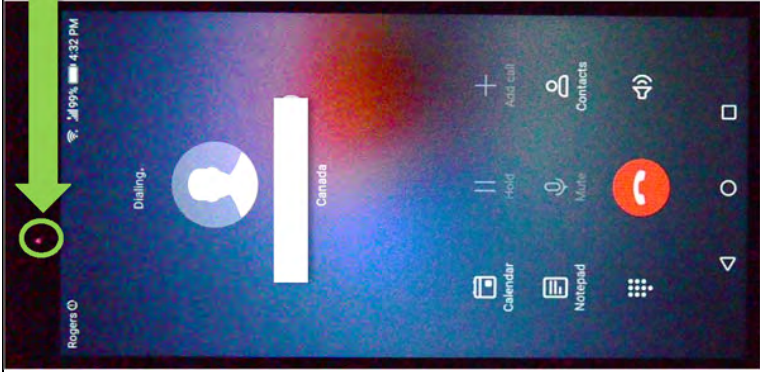
	KOTLIN	JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-5 – Infringement of U.S. Patent No. 8,204,554

	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Mate SE is a range-detecting sensor.</p>

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	 <p>The optical range sensing proximity sensor emits Inf Red light senses the reflection to determine if external objects are proximate</p> <p>The proximity sensor detects the range of a proximate object:</p> <p>By way of example only, when an incoming call is answered, and the device is not proximate to the object, approximately 7 cm from the object the display is on. The mobile station is moved proximate to the ear, approximately 4cm the display is off.</p>
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BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

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By way of further example, the Android Developer Code Website describes range detection in proximity sensors:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
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See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

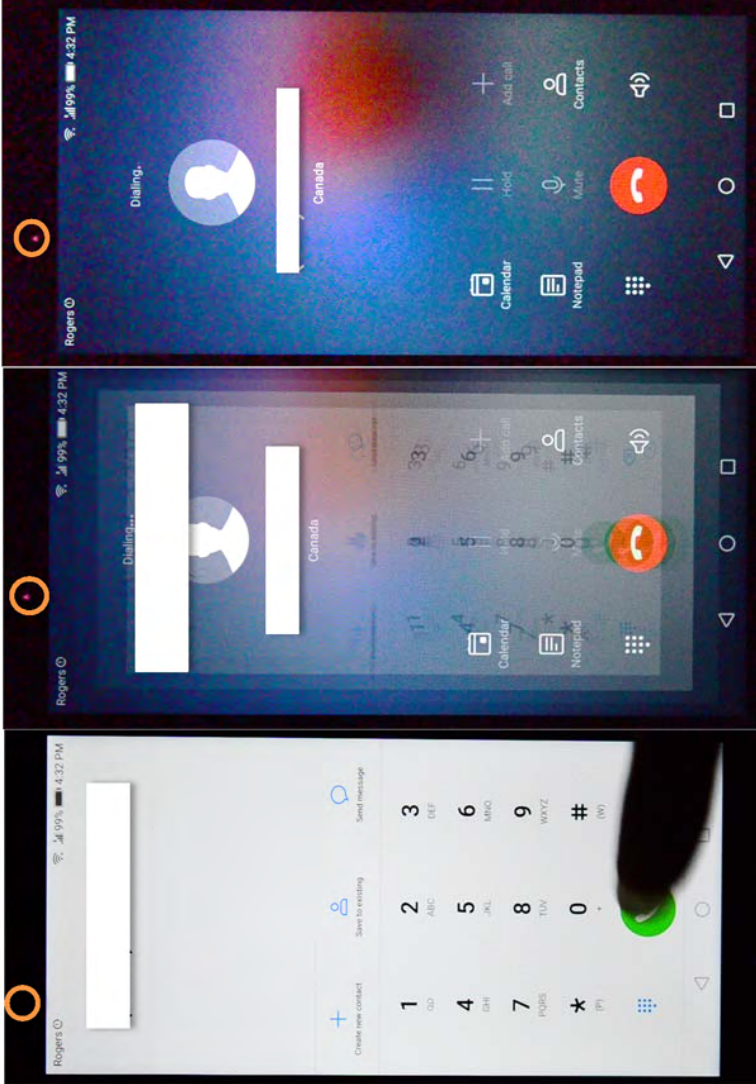
And also, the code shows distance measurement:

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	<pre>override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. }</pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>The Android Developer Code Website further explains:</p> <p>★ Note: Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the <code>getMaximumRange()</code> method.</p> <p><i>See id.</i></p>
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BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

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<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The proximity sensor of the Huawei Mate SE begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p> 

In addition, by way of further example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating or receiving a call, including by providing exemplary code at least substantially similar to Huawei code:

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-5 –Infringement of U.S. Patent No. 8,204,554

	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1(preamble); 1 [ii]- [iii]; 1(b)-(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call</p>	<p>The Huawei Mate SE detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being</p>

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<p>condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call;</p>	<p>that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p> <p>See claim 1(a).</p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Mate SE activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists.</p> <p>See claim 1(b).</p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Mate SE reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p> <p>See claim 1(c)-(d).</p>
<p>14. A mobile station, comprising:</p>	<p>See claim 1(preamble).</p>
<p>a display;</p>	<p>See claim 1[i].</p>
<p>a proximity sensor</p>	<p>See claim 1[ii].</p>
<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p>See claim 1[iii].</p>

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Exhibit B-5 –Infringement of U.S. Patent No. 8,204,554

<p>and a microprocessor adapted to:</p> <p>(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>See claim[iv].</p> <p>The microprocessor of the Huawei Mate SE is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p>See claim 1(a).</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>See claim 1(b).</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>See claim 1(c).</p>
<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p>See claim 1(d).</p>

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Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

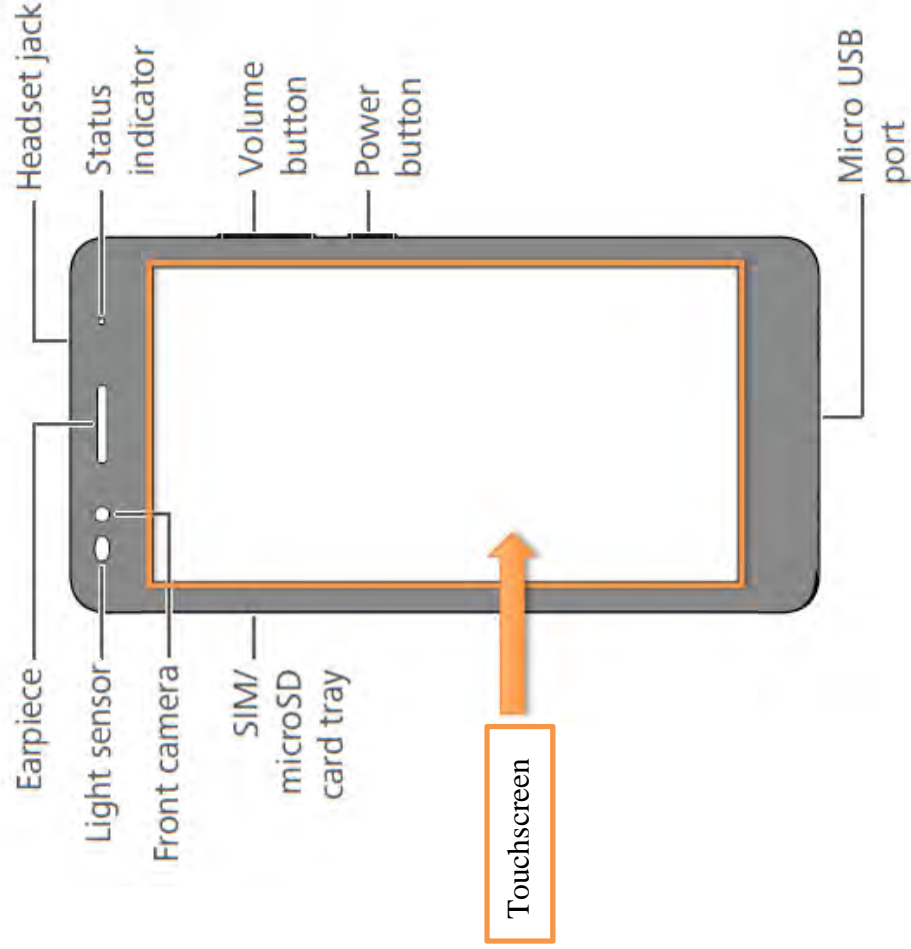
Asserted Claim Elements	Huawei Sensa																								
<p>1. A mobile station, comprising:</p>	<p>To the extent that the preamble is found to be limiting, the Huawei Sensa is a mobile station.</p> <div><table border="1"><caption>System Status Information from Huawei Sensa</caption><thead><tr><th>Item</th><th>Value</th></tr></thead><tbody><tr><td>Service state</td><td>Not in service</td></tr><tr><td>Roaming</td><td>Not roaming</td></tr><tr><td>Mobile data state</td><td>Disconnected</td></tr><tr><td>My phone number</td><td>0760000</td></tr><tr><td>IMEI SV</td><td>25</td></tr><tr><td>IP address</td><td>Unavailable</td></tr><tr><td>WiFi MAC address</td><td>88:3E:87:13:86:57</td></tr><tr><td>Bluetooth address</td><td>Unavailable</td></tr><tr><td>Serial number</td><td>F21310HAI1209016</td></tr><tr><td>Up time</td><td>18:00</td></tr><tr><td>IMEI registration status</td><td>Not registered</td></tr></tbody></table></div>	Item	Value	Service state	Not in service	Roaming	Not roaming	Mobile data state	Disconnected	My phone number	0760000	IMEI SV	25	IP address	Unavailable	WiFi MAC address	88:3E:87:13:86:57	Bluetooth address	Unavailable	Serial number	F21310HAI1209016	Up time	18:00	IMEI registration status	Not registered
Item	Value																								
Service state	Not in service																								
Roaming	Not roaming																								
Mobile data state	Disconnected																								
My phone number	0760000																								
IMEI SV	25																								
IP address	Unavailable																								
WiFi MAC address	88:3E:87:13:86:57																								
Bluetooth address	Unavailable																								
Serial number	F21310HAI1209016																								
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IMEI registration status	Not registered																								

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

[i] a display;

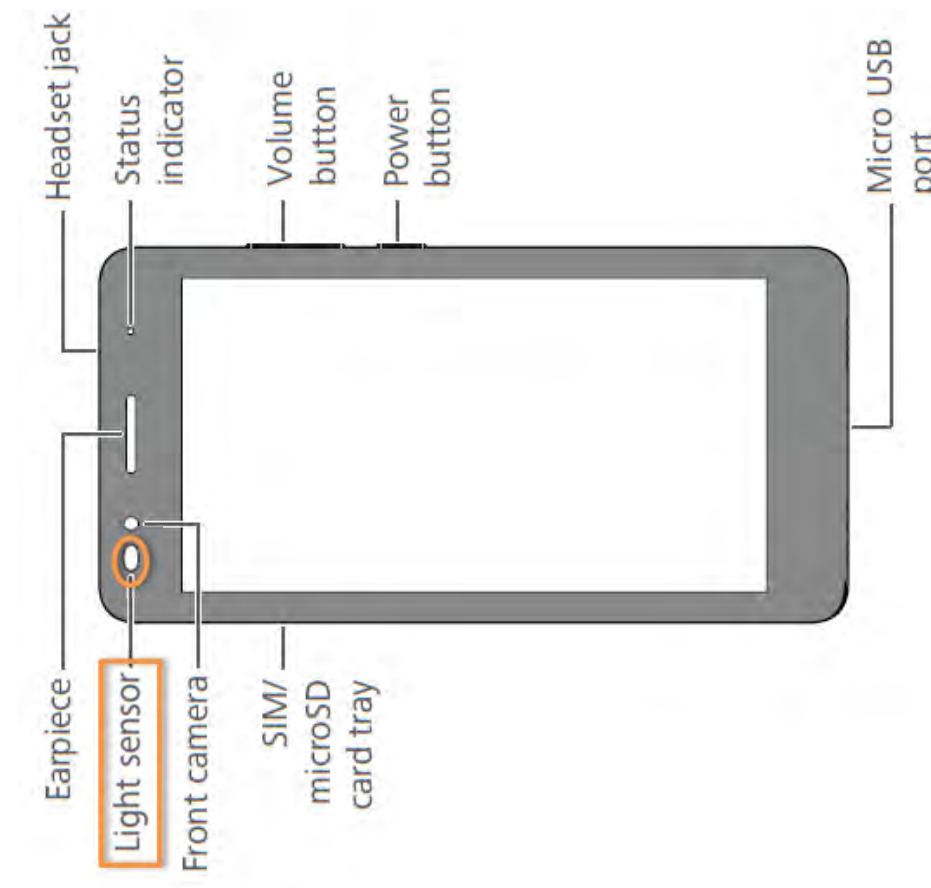
The Huawei Sensa includes a display.



“Use simple **touchscreen** gestures to perform a variety of tasks, such as open applications, scroll through lists, and zoom images.”

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Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

	<p>See http://consumer-tkb.huawei.com/cpgw/msa/TKB/app_0000000000011227-CcpTKBKnowOut/ctkbknowout/servlet/show/knowAttachmentServlet?knowId=en-us00350812_pp.1 & 8, last accessed Nov 23, 2018.</p>
<p>[ii] a proximity sensor</p>	<p>The Huawei Sensa includes a proximity sensor.</p>  <p>The diagram shows a smartphone with the following components labeled: Earpiece, Light sensor (highlighted with an orange box), Front camera, SIM/microSD card tray, Headset jack, Status indicator, Volume button, Power button, and Micro USB port.</p>

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Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

	<p>See http://consumer-tkb.huawei.com/ccpgw/msa/TKB/app_00000000000011227-CcpTKBKnowOut/ctkbknowout/servlet/show/knowAttachmentServlet?knowId=en-us00350812 p. 1, last accessed Nov 23, 2018.</p>
<p>[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate; and</p>	<p>The proximity sensor of the Huawei Sensa is adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate.</p> <p>By way of example only, the Huawei Sensa is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:</p> <div style="border: 1px solid black; padding: 5px;"> <p>TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</p> <p style="text-align: right;">Phone position during a call.</p> </div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.</p>

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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <pre>isWakeUpSensor()</pre> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:</p>	<pre>isWakeUpSensor</pre> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p>added in API level 21</p>

Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See [SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (for example, when a user making or receiving a phone call).”

Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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	KOTLIN	JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

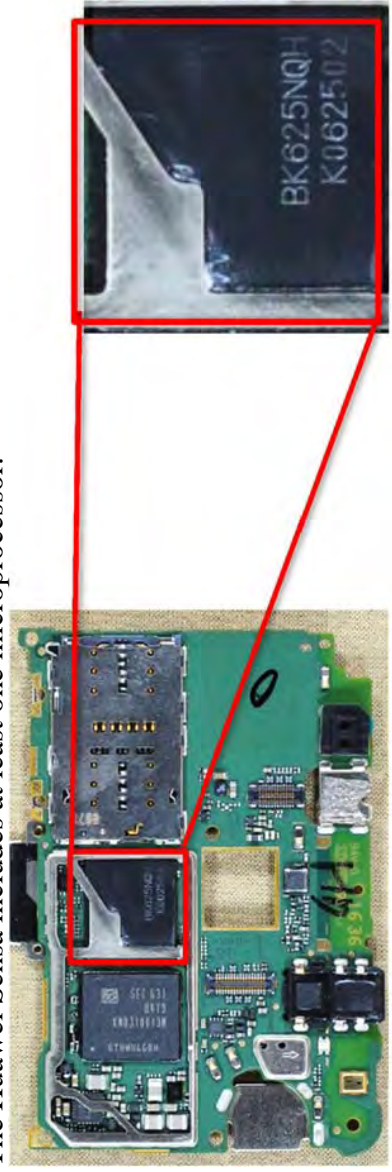
Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

```
override fun onSensorChanged(event: SensorEvent) {  
    val distance = event.values[0]  
    // Do something with this sensor data.  
}  
  
override fun onResume() {  
    // Register a listener for the sensor.  
    super.onResume()  
  
    mProximity?.also { proximity ->  
        mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL)  
    }  
  
    override fun onPause() {  
        // Be sure to unregister the sensor when the activity pauses.  
        super.onPause()  
        mSensorManager.unregisterListener(this)  
    }  
}
```

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.

[iv] a microprocessor adapted to:

The Huawei Sensa includes at least one microprocessor.



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Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554


	<p>“Chipset: QUALCOMM ” See https://www.cnet.com/products/Huawei-sensa-lte-4g-lte-16-gb-gsm-smartphone/specs/, last accessed Nov 23, 2018.</p>
<p>(a) determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Sensa is adapted to determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p>The microprocessor is able to determine when the user initiates an outgoing call or answers an incoming call.</p>
	

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By way of example only, the Huawei Sensa is an Android phone. The Huawei Sensa's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;

Outgoing Call:

```
/**  
 * Broadcast receiver to detect the outgoing calls.  
 */  
public class OutgoingReceiver extends BroadcastReceiver {  
    public OutgoingReceiver() {  
    }  
    @Override  
    public void onReceive(Context context, Intent intent) {  
        String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER);  
        Toast.makeText(ctx,  
            "Outgoing: "+number,  
            Toast.LENGTH_LONG).show();  
    }  
}
```

In the above, the system sends a broadcast action `android.intent.action.NEW_OUTGOING_CALL`.

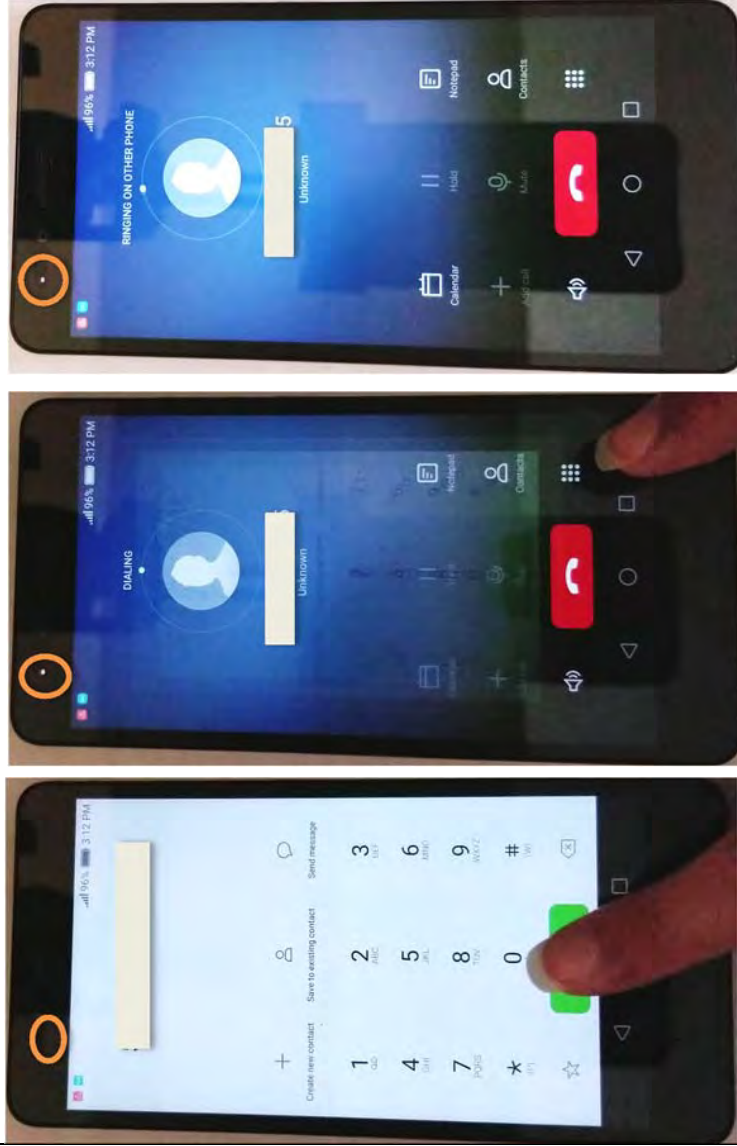
Incoming Call:

Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

	<pre> /** * Listener to detect incoming calls. */ private class CallStateListener extends PhoneStateListener { @Override public void onCallStateChanged(int state, String incomingNumber) { switch (state) { case TelephonyManager.CALL_STATE_RINGING: // called when someone is ringing to this phone Toast.makeText(ctx, "Incoming: "+incomingNumber, Toast.LENGTH_LONG).show(); break; } } } } </pre> <p>In the above, state is the call state, where it may be CALL_STATE_RINGING, CALL_STATE_OFFHOOK, or CALL_STATE_IDLE. Ringing is the state when someone is calling, offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Sensa is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p>

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Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554



By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.

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	<p>The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:</p> <p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>
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	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually.</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Sensa, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Sensa is adapted to receive the signal from the activated proximity sensor.</p> <p>When the call button or answer button is pressed according to the above, the display darkens, indicated that the microprocessor received the signal from the activated proximity sensor that an object was proximate, and, in turn, reduced power to the display.</p>

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	 <p>By way of further example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:</p>
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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>
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Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p>	
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(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

The microprocessor of the Huawei Sensa is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

By way of example only, the first image shows that the Huawei Sensa is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Sensa, power to the display is reduced and the display is darkened.

	 <p>The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.</p>
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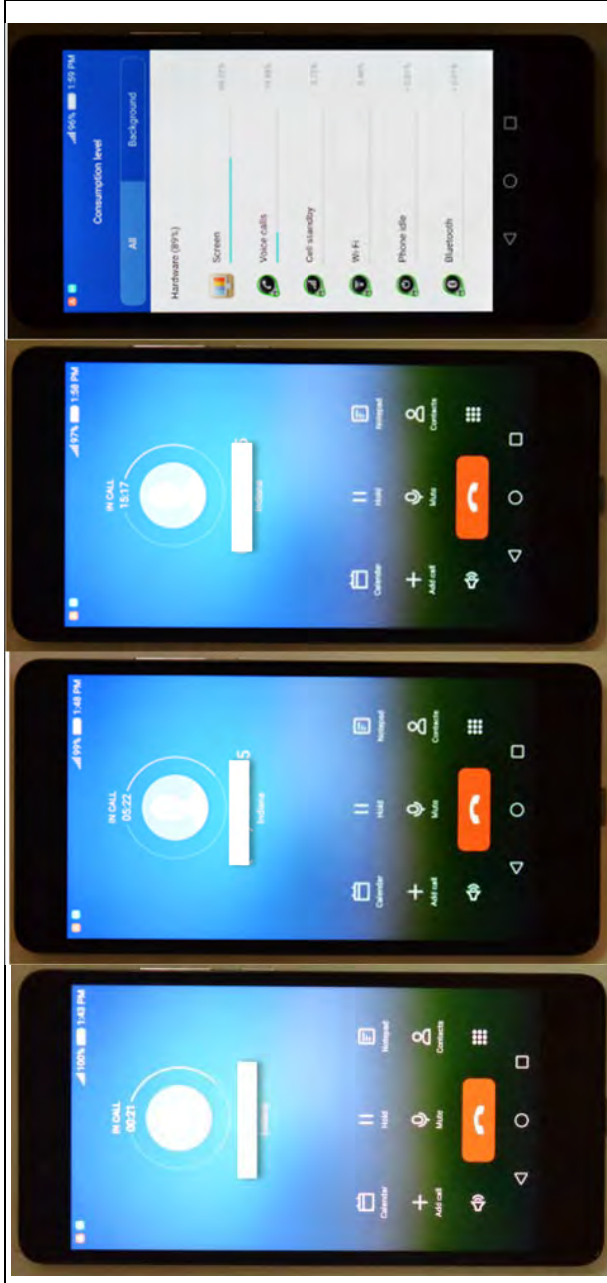


The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.

By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally.

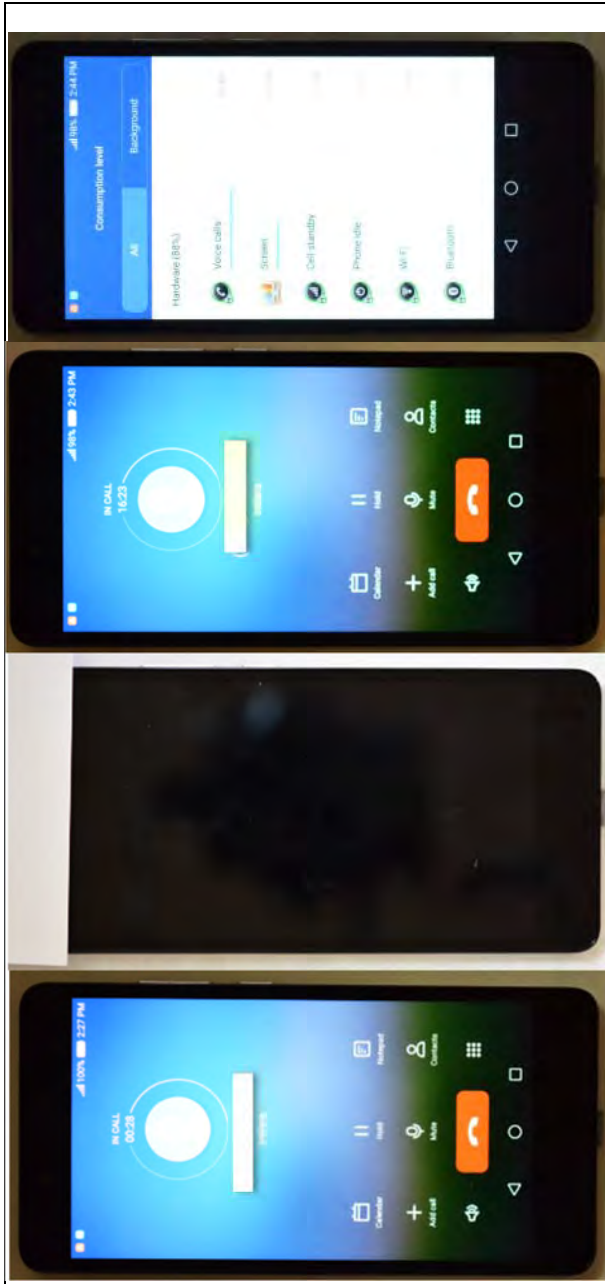
BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

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	 <p>When the call begins, the battery starts at a charge of 100%. After the call, the battery is at 96%. The screen consumed 68.22% of the battery.</p> <p>The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.</p>
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When the call begins, the battery starts at a charge of 100%. After the call, the battery is at 98%. The screen consumed 31.15% of the battery.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of further example, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
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See https://developer.android.com/guide/topics/sensors/sensors/sensors_overview, last accessed November 29, 2018.

In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

	KOTLIN	JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018</p>
<p>2. The mobile station of claim 1,</p>	<p>See claim 1.</p>

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further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

The microprocessor of the Huawei Sensa increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.


By way of example only, the first image shows that the Huawei Sensa is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Sensa, power to the display is reduced and the display is darkened.

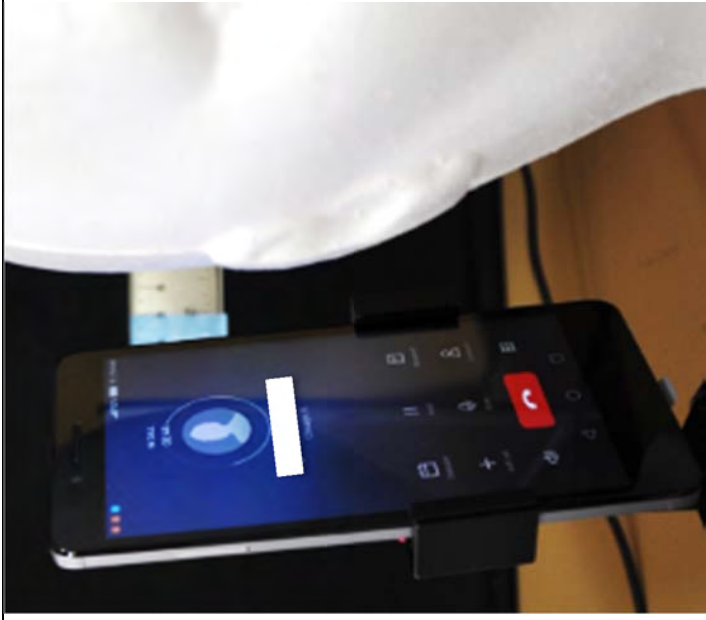
BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

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	 <p>The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.</p>
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	 <p>By way of further example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call).”</p> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.</p>
<p>4. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>

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wherein the microprocessor reduces power to the display by turning off the display.

The microprocessor of the Huawei Sensa reduces power to the display by turning off the display. When the call button or answer button is pressed and the ear is proximate to the Huawei Sensa, power to the display is reduced and the display is turned off.

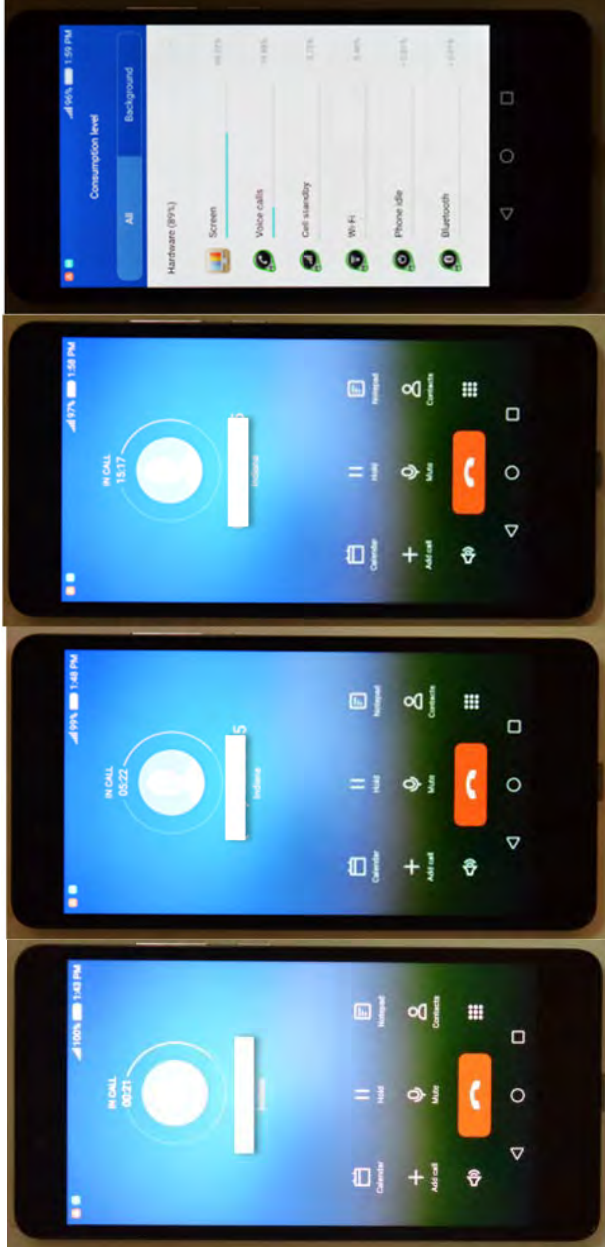


The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.

By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally

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	 <p>When the call begins, the battery starts at a charge of 100%. After the call, the battery is at 96%. The screen consumed 68.22% of the battery.</p> <p>The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.</p>
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	<p>When the call begins, the battery starts at a charge of 100%. After the call, the battery is at 98%. The screen consumed 31.15% of the battery.</p> <p>By way of further example only, the Android Developer Code Website describes the proximity sensor's signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:</p>
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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x000000008)</p>	<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>
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Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See [SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See <https://developer.android.com/guide/topics/sensors/sensors/overview>, last accessed November 29, 2018.

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<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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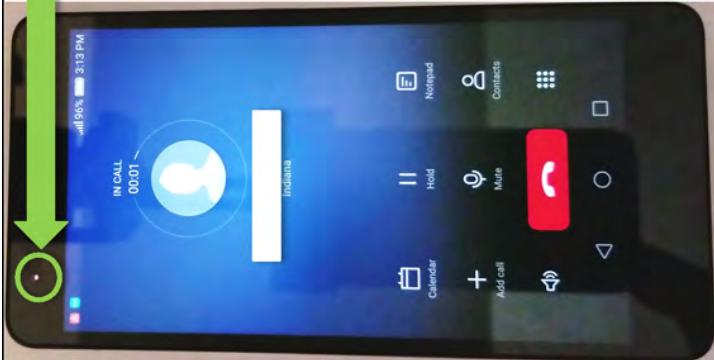
	KOTLIN	JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>	
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Sensa is a range-detecting sensor.</p>

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	 <p><i>The optical range sensing proximity sensor emits Inf Red light senses the reflection to determine if external objects are proximate</i></p> <p>The proximity sensor detects the range of a proximate object:</p> <p>By way of example only, when an incoming call is answered, and the device is not proximate to the object, approximately 7 cm from the object the display is on. The mobile station is moved proximate to the ear, approximately 4cm the display is off.</p>
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By way of further example, the Android Developer Code Website describes range detection in proximity sensors:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
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See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

And also, the code shows distance measurement:

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	<pre>override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. }</pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>The Android Developer Code Website further explains:</p> <p>★ Note: Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the <code>getMaximumRange()</code> method.</p> <p><i>See id.</i></p>
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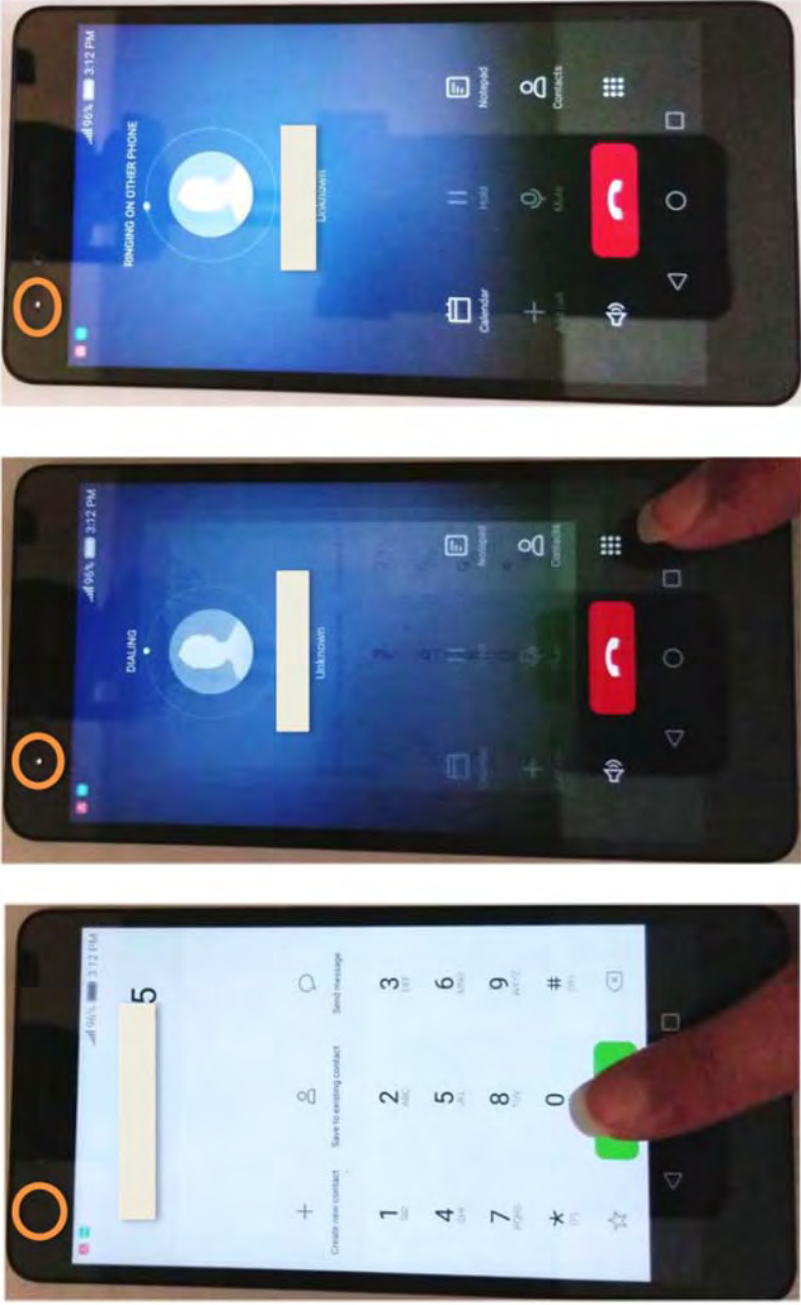
<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The proximity sensor of the Huawei Sensa begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p>
	

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In addition, by way of further example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating or receiving a call, including by providing exemplary code at least substantially similar to Huawei code:

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

KOTLIN	JAVA
<pre> class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } </pre>	

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1 (preamble); 1 [ii]-[iii]; 1 (b)-(d).</p>
<p>the mobile station detecting the existence of an initiated call</p>	<p>The Huawei Sensa detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being that a user of</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

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<p>condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call;</p>	<p>the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p> <p><i>See claim 1(a).</i></p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Sensa activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists.</p> <p><i>See claim 1(b).</i></p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Sensa reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p> <p><i>See claim 1(c)-(d).</i></p>
<p>14. A mobile station, comprising:</p>	<p><i>See claim 1(preamble).</i></p>
<p>a display;</p>	<p><i>See claim 1[i].</i></p>
<p>a proximity sensor</p>	<p><i>See claim 1[ii].</i></p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p><i>See claim 1[iii].</i></p>
<p>and a microprocessor adapted to:</p>	<p><i>See claim [iv].</i></p>
<p>(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Sensa is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p><i>See claim 1(a).</i></p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p><i>See claim 1(b).</i></p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p><i>See claim 1(c).</i></p>
<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p><i>See claim 1(d).</i></p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-6 – Infringement of U.S. Patent No. 8,204,554

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Asserted Claim Elements

Huawei Ascend Mate 2

1. A mobile station, comprising:

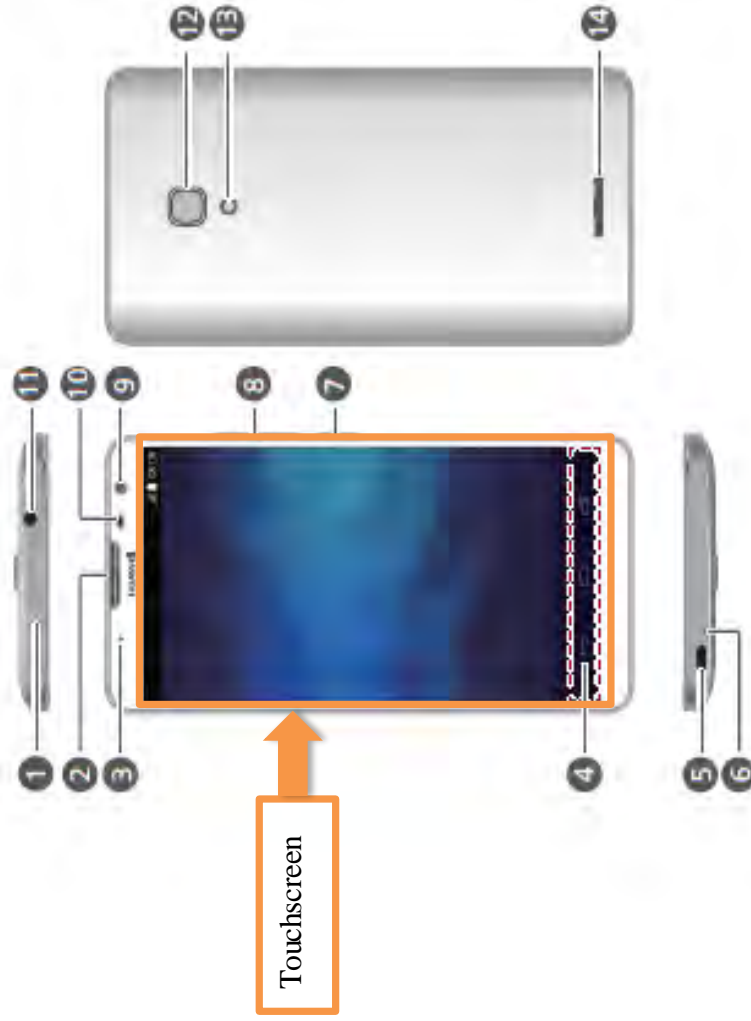
To the extent that the preamble is found to be limiting, the Huawei Ascend Mate 2 is a mobile station.



[1] a display;

The Huawei Ascend Mate 2 includes a display.

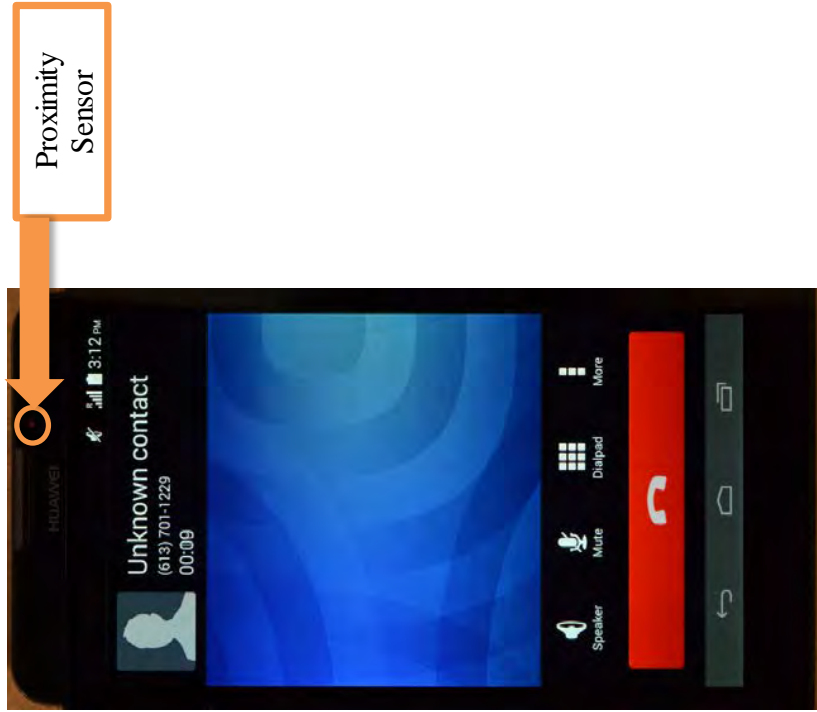
Your phone at a glance



See http://consumer-ukb.huawei.com/ccpgw/msa/TKB/app_0000000000011227-CcpTKBKnowOut/ctkbknowout/servlet/show/knowAttachmentServlet?knowId=en-us00351749_last accessed Nov 29, 2018.

[ii] a proximity sensor

The Huawei Ascend Mate 2 includes a proximity sensor.



[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate; and

The proximity sensor of the Huawei Ascend Mate 2 is adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate.

By way of example only, the Huawei Ascend Mate 2 is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
-----------------------	-----------------	---	-------------------------------

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.

TYPE_PROXIMITY

```
public static final int TYPE_PROXIMITY
```

A constant describing a proximity sensor type. This is a wake up sensor.

See [SensorEvent.values](#) for more details.

See also:

[isWakeUpSensor\(\)](#)

Constant Value: 8 (0x00000008)

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the `isWakeUpSensor` file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:

`isWakeUpSensor` added in API level 21

```
public boolean isWakeUpSensor ()
```

Returns true if the sensor is a wake-up sensor.

Application Processor Power modes

Application Processor (AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "suspend" mode, reducing the power consumption by 10 times or more.

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

[SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor "to determine how far away a person's head is from the face of a handset device (for example, when a user making or receiving a phone call)."

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

KOTLIN

JAVA

```
class SensorActivity : Activity(), SensorEventListener {  
  
    private lateinit var mSensorManager: SensorManager  
    private var mProximity: Sensor? = null  
  
    public override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.main)  
  
        // Get an instance of the sensor service, and use that to get an instance of  
        // a particular sensor.  
        mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager  
        mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)  
    }  
  
    override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) {  
        // Do something here if sensor accuracy changes.  
    }  
}
```

```
override fun onSensorChanged(event: SensorEvent) {
    val distance = event.values[0]
    // Do something with this sensor data.
}

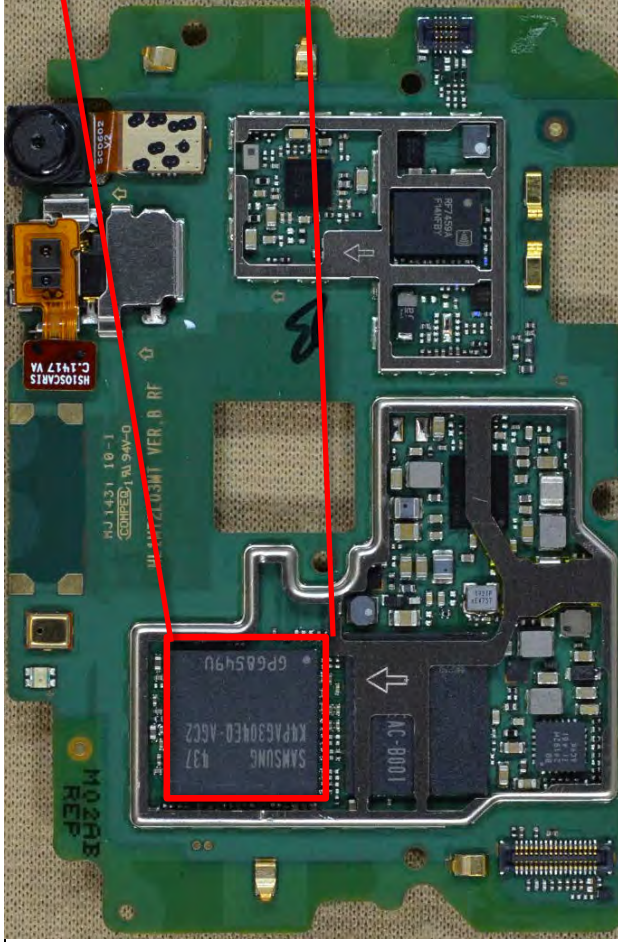
override fun onResume() {
    // Register a listener for the sensor.
    super.onResume()

    mProximity?.also { proximity ->
        mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL)
    }
}

override fun onPause() {
    // Be sure to unregister the sensor when the activity pauses.
    super.onPause()
    mSensorManager.unregisterListener(this)
}
```

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.

[iv] a microprocessor adapted to:



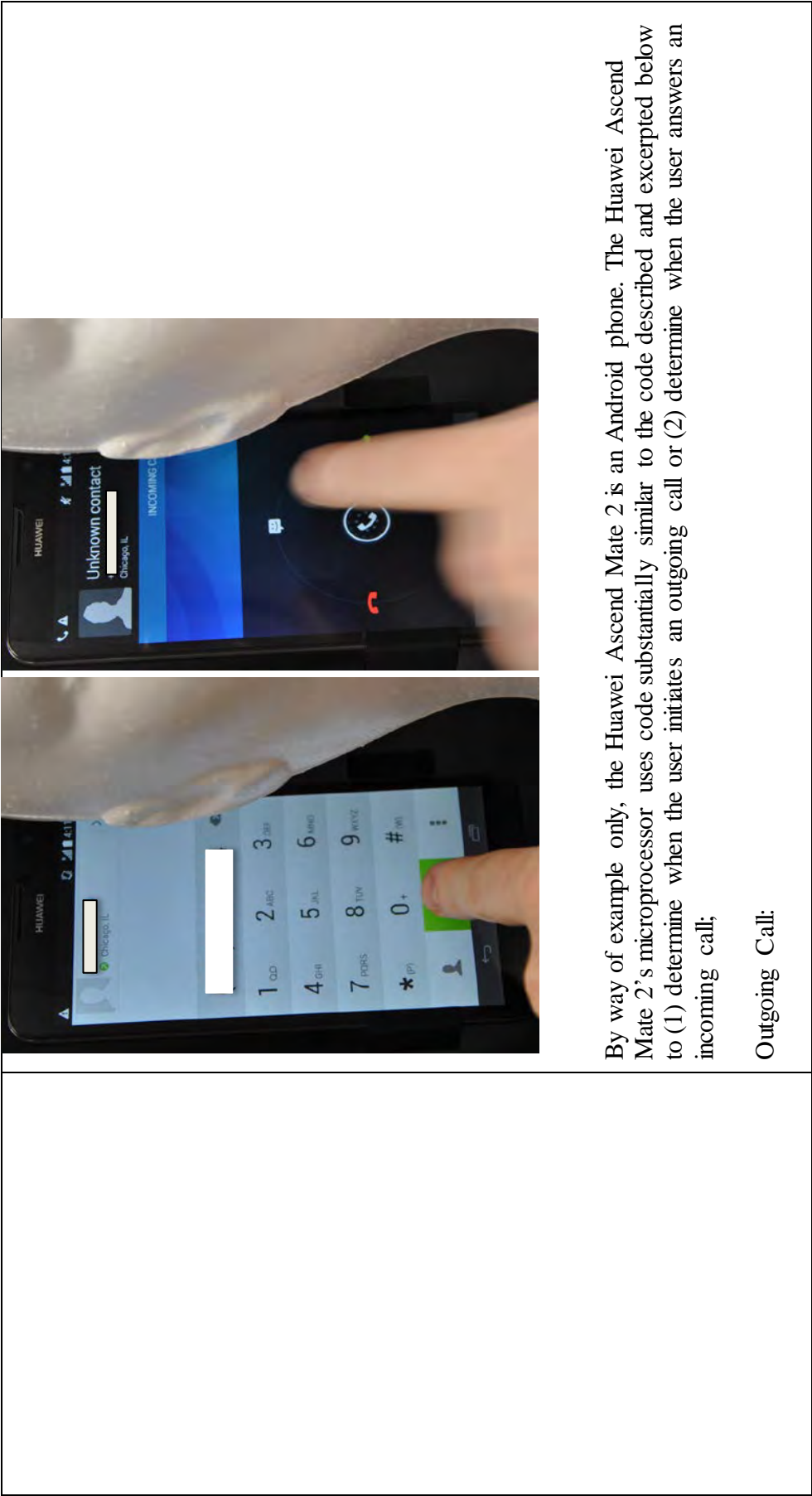
The Huawei Ascend Mate 2 includes at least one microprocessor.

“1.6GHz Qualcomm Quad-Core MSM8928”

See <https://www.cnet.com/products/huawei-ascend-mate2-4g/specs/>, last accessed Nov. 29, 2018.

(a) determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;

The microprocessor of the Huawei Ascend Mate 2 is adapted to determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.



By way of example only, the Huawei Ascend Mate 2 is an Android phone. The Huawei Ascend Mate 2's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;

Outgoing Call:

```

/**
 * Broadcast receiver to detect the outgoing calls.
 */
public class OutgoingReceiver extends BroadcastReceiver {
    public OutgoingReceiver() {
    }

    @Override
    public void onReceive(Context context, Intent intent) {
        String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER);

        Toast.makeText(ctx,
            "Outgoing: "+number,
            Toast.LENGTH_LONG).show();
    }
}

```

In the above, the system sends a broadcast action `android.intent.action.NEW_OUTGOING_CALL`.

Incoming Call:

```

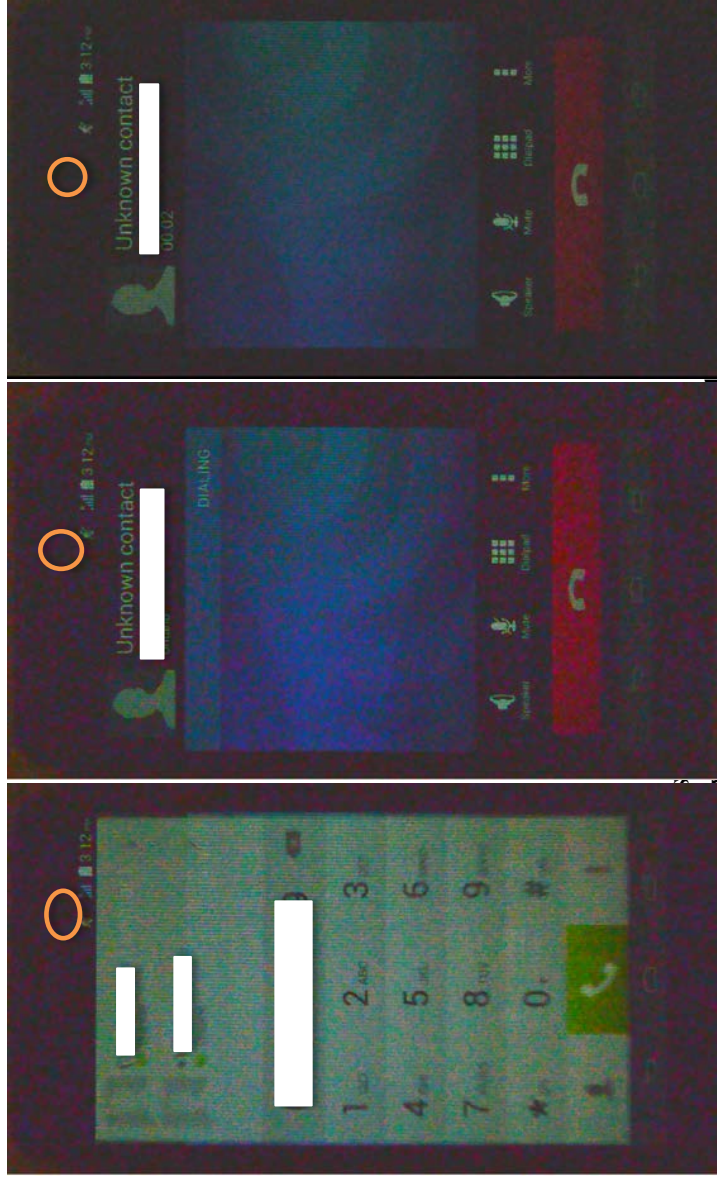
/**
 * Listener to detect incoming calls.
 */
private class CallStateListener extends PhoneStateListener {
    @Override
    public void onCallStateChanged(int state, String incomingNumber) {
        switch (state) {
            case TelephonyManager.CALL_STATE_RINGING:
                // called when someone is ringing to this phone
                Toast.makeText(ctx,
                    "Incoming: "+incomingNumber,
                    Toast.LENGTH_LONG).show();
                break;
        }
    }
}

```

In the above, state is the call state, where it may be `CALL_STATE_RINGING`, `CALL_STATE_OFFHOOK`, or `CALL_STATE_IDLE`. Ringing is the state when someone is calling,

	<p>offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Ascend Mate 2 is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p>

The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.



By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.

The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:

TYPE_PROXIMITY

public static final int TYPE_PROXIMITY

A constant describing a proximity sensor type. This is a wake up sensor.

See [SensorEvent.values](#) for more details.

See also:

[isWakeUpSensor\(\)](#)

Constant Value: 8 (0x00000008)

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the `isWakeUpSensor` file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:

`isWakeUpSensor`

public boolean isWakeUpSensor ()

Returns true if the sensor is a wake-up sensor.

Application Processor Power modes

Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.

added in API level 21

	<p>See <u>https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()</u>, last accessed November 29, 2018.</p> <p>In the Huawei Ascend Mate 2, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Ascend Mate 2 is adapted to receive the signal from the activated proximity sensor.</p> <p>When the call button or answer button is pressed according to the above, the display darkens, indicated that the microprocessor received the signal from the activated proximity sensor that an object was proximate, and, in turn, reduced power to the display.</p>



By way of further example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:

TYPE_PROXIMITY

```
public static final int TYPE_PROXIMITY
```

A constant describing a proximity sensor type. This is a wake up sensor.

See [SensorEvent.values](#) for more details.

See also:

```
isWakeUpSensor\(\)
```

Constant Value: 8 (0x00000008)

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the `isWakeUpSensor` file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:

```
isWakeUpSensor
```

```
public boolean isWakeUpSensor ()
```

Returns true if the sensor is a wake-up sensor.

Application Processor Power modes

Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.

added in API level 21

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

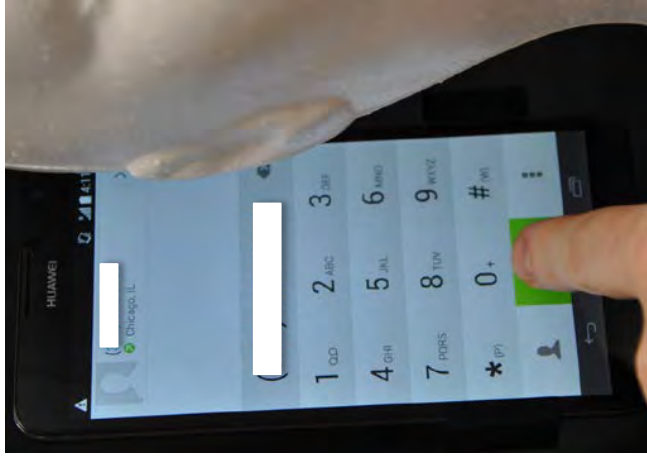
`SensorManager.registerListener(SensorEventListener, Sensor, int, int)` for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.htm#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.htm#isWakeUpSensor()), last accessed November 29, 2018.

(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

The microprocessor of the Huawei Ascend Mate 2 is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

By way of example only, the first image shows that the Huawei Ascend Mate 2 is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Ascend Mate 2, power to the display is reduced and the display is darkened.

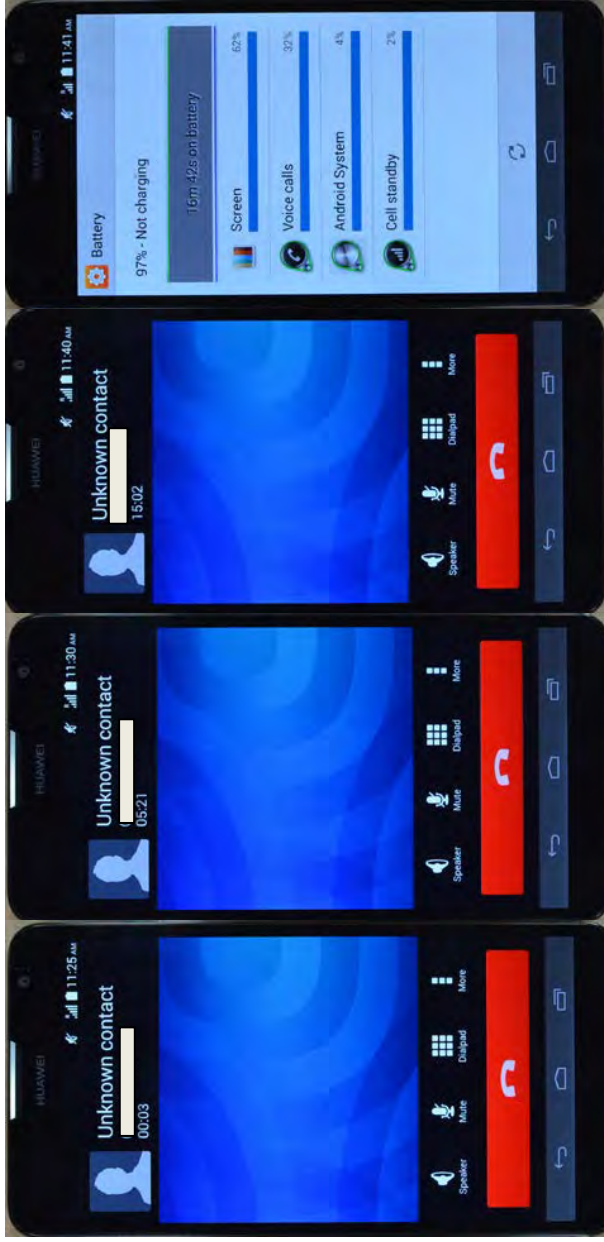


The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.



The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.

By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally.



When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 97%. The screen consumed 62% of the battery usage.

The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.

When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 99%. The screen consumed 73% of the battery usage.



By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of further example, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
-----------------------	----------	---	-------------------------------

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person’s head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

KOTLIN

JAVA

```
class SensorActivity : Activity(), SensorEventListener {  
  
    private lateinit var mSensorManager: SensorManager  
    private var mProximity: Sensor? = null  
  
    public override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.main)  
  
        // Get an instance of the sensor service, and use that to get an instance of  
        // a particular sensor.  
        mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager  
        mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)  
    }  
  
    override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) {  
        // Do something here if sensor accuracy changes.  
    }  
}
```

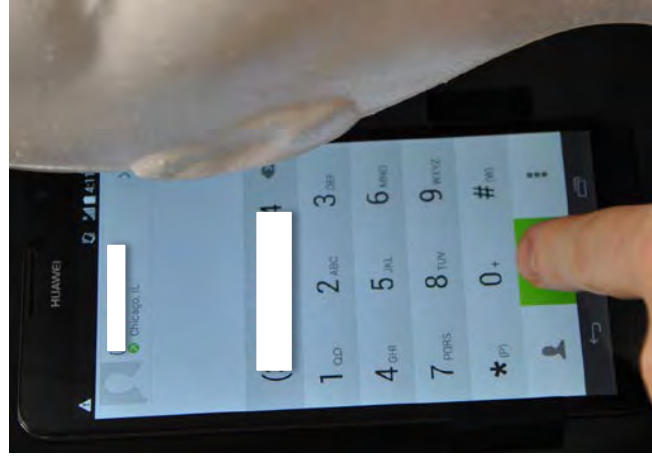
	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018</p>
2. The mobile station of claim 1,	See claim 1.

further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

The Huawei Ascend Mate 2 increases the power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of example only, the first image shows that the Huawei Ascend Mate 2 is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Ascend Mate 2, power to the display is reduced and the display is darkened.



The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.




By way of further example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person’s head is from the face of a handset device (for example, when a user is making or receiving a phone call).”

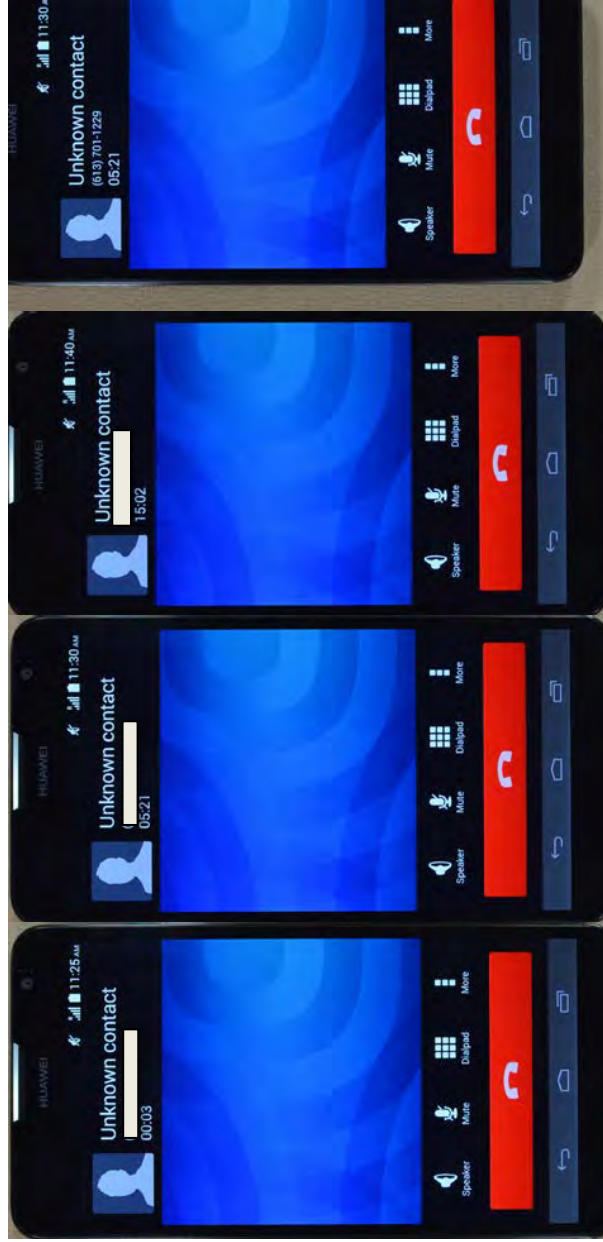
See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.

4. The mobile station as recited in claim 1,

See claim 1.

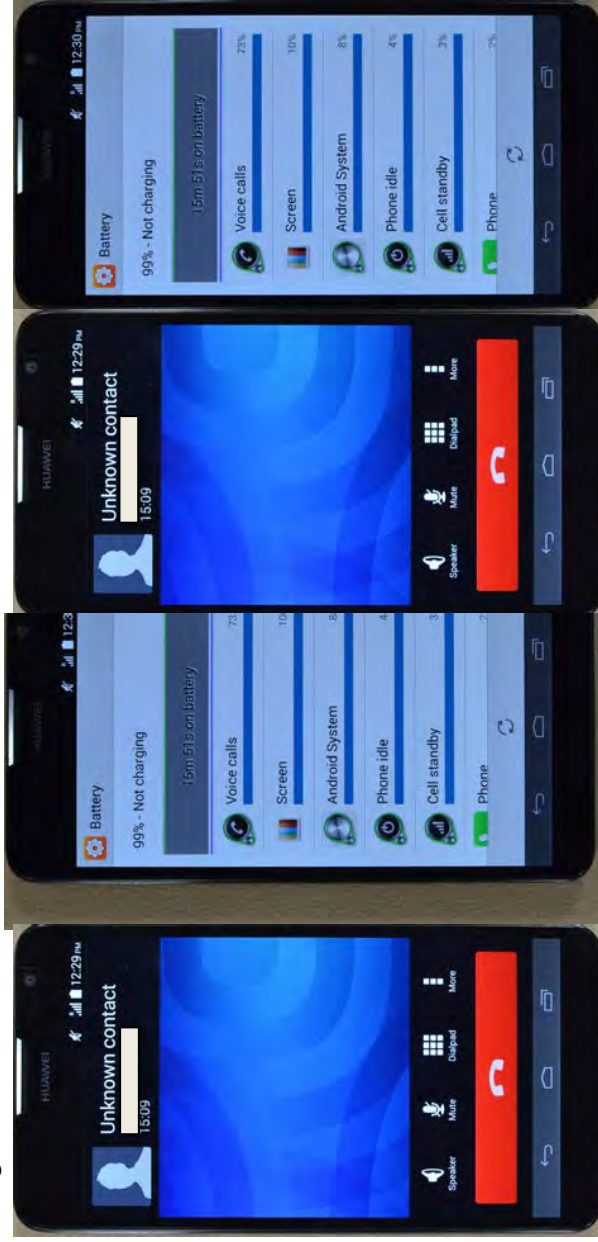
<p>wherein the microprocessor reduces power to the display by turning off the display.</p>	<p>The microprocessor of the Huawei Ascend Mate 2 reduces power to the display by turning off the display.</p> <p>When the call button or answer button is pressed and the ear is proximate to the Huawei Ascend Mate 2, power to the display is reduced and the display is turned off.</p>  <p>The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.</p>
--	--

By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally.



When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 97%. The screen consumed 62% of the battery usage.

The next series shows computed power use and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during call.



When the call begins, the battery starts at a charge of 100%. After the call, the battery is still at 99%. The screen consumed 73% of the battery usage.

By way of further example only, the Android Developer Code Website describes the proximity sensor's signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:

<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the <code>isWakeUpSensor</code> file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>
	<pre>isWakeUpSensor</pre> <p>added in API level 21</p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor (AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p>

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

`SensorManager.registerListener(SensorEventListener, Sensor, int, int)` for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

KOTLIN

JAVA

```
class SensorActivity : Activity(), SensorEventListener {  
  
    private lateinit var mSensorManager: SensorManager  
    private var mProximity: Sensor? = null  
  
    public override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.main)  
  
        // Get an instance of the sensor service, and use that to get an instance of  
        // a particular sensor.  
        mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager  
        mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)  
    }  
  
    override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) {  
        // Do something here if sensor accuracy changes.  
    }  
}
```

	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Ascend Mate 2 is a range-detecting sensor.</p>

The proximity sensor detects the range of a proximate object:



The optical range sensing proximity sensor emits Inf Red light senses the reflection to determine if external objects are proximate

By way of example only, when an incoming call is answered, and the device is not proximate to the object, approximately 8 cm from the object the display is on. The mobile station is moved proximate to the ear, approximately 4cm the display is off.



By way of further example, the Android Developer Code Website describes range detection in proximity sensors:

TYPE_PROXIMITY

Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.

Phone position during a call.

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

And also, the code shows distance measurement:



```
override fun onSensorChanged(event: SensorEvent) {  
    val distance = event.values[0]  
    // Do something with this sensor data.  
}
```

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.

The Android Developer Code Website further explains:

★ **Note:** Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the `getMaximumRange()` method.

See id.

<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The proximity sensor of the Huawei Ascend Mate 2 begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p> 

In addition, by way of further example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating or receiving a call, including by providing exemplary code at least substantially similar to Huawei code:

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

KOTLIN

JAVA

```
class SensorActivity : Activity(), SensorEventListener {  
  
    private lateinit var mSensorManager: SensorManager  
    private var mProximity: Sensor? = null  
  
    public override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.main)  
  
        // Get an instance of the sensor service, and use that to get an instance of  
        // a particular sensor.  
        mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager  
        mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)  
    }  
  
    override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) {  
        // Do something here if sensor accuracy changes.  
    }  
}
```




	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>To the extent that the preamble is found to be limiting, see claim 1(preamble); 1[ii]-[iii]; 1(b)-(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call condition independent and different</p>	<p>The Huawei Ascend Mate 2 detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p>

<p>from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call;</p>	<p>See claim 1(a).</p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Ascend Mate 2 activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists. See claim 1(b).</p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Ascend Mate 2 reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists. See claim 1(c)-(d).</p>
<p>14. A mobile station, comprising:</p>	<p>See claim 1(preamble).</p>
<p>a display;</p>	<p>See claim 1[i].</p>
<p>a proximity sensor</p>	<p>See claim 1[ii].</p>
<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p>See claim 1[iii].</p>
<p>and a microprocessor adapted to:</p>	<p>See claim[iv].</p>

<p>(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Ascend Mate 2 is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p>See claim 1(a).</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>See claim 1(b).</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>See claim 1(c).</p>
<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p>See claim 1(d).</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-8 –Infringement of U.S. Patent No. 8,204,554

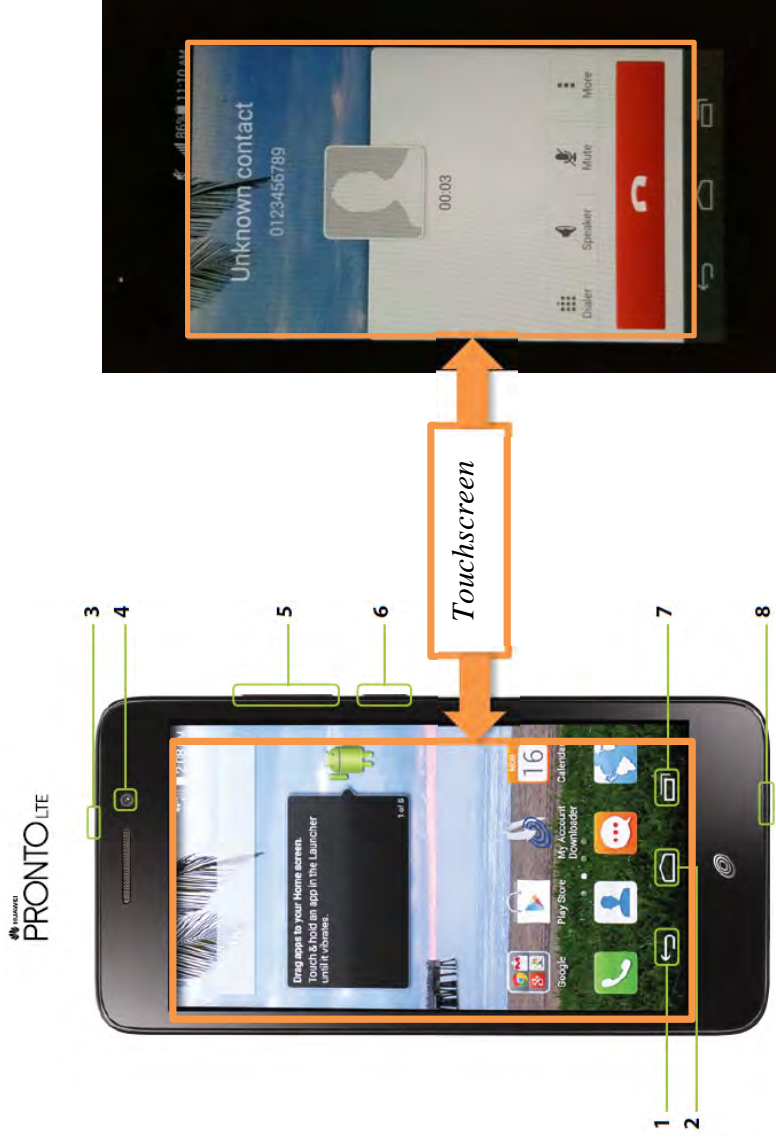
Asserted Claim Elements	Huawei Pronto
<p>1. A mobile station, comprising:</p>	<p>To the extent that the preamble is found to be limiting, the Huawei Pronto is a mobile station.</p> <div><p>The screenshot shows the 'Status' page of a Huawei Pronto mobile station. The status bar at the top indicates 'No service', signal strength, 88% battery, and 2:27 PM. The main content area lists the following information:</p><ul style="list-style-type: none">IMEI: 866164021140261IMEI SV: 64IP address: UnavailableWi-Fi MAC address: 50-A7-2B-99-3F-DCBluetooth address: UnavailableSerial number: 50A728994D25Up time: 02:00Device status: Official</div> <div><p>The image shows the back cover of a black Huawei Pronto mobile station. The cover is open, revealing the battery compartment. The Huawei logo is visible at the top. Below the logo, there are two numbered instructions:</p><ol style="list-style-type: none">1. Open the battery cover.2. Insert the micro-SIM card. Insert the microSD card (optional).<p>Below the instructions, there are two diagrams: one showing a micro-SIM card being inserted into the battery compartment, and another showing a microSD card being inserted into a separate slot. At the bottom of the cover, there is a 'Warning' section with the following text:</p><p>Warning: This device supports micro-SIM cards only. Do not use any other sizes. Do not remove the built-in battery yourself. Do not use the device while installing or removing microSD or micro-SIM card.</p><p>Tips: To safely restart your phone, press and hold the power button with your phone, release the main power button, and then press the power button again for about 15 seconds. If your phone needs to be turned on up to 30 minutes before you can turn on your phone for the first time.</p></div>

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Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

[i] a display;

The Huawei Pronto includes a display.



https://media.tracfone.com/wps/wcm/connect/d5a8bcde-3697-42f2-b08d-5590c1d90f6a/ST_QUAG_STH89IG_ENG_F.pdf?MOD=AJPERES&CACHEID=d5a8bcde-3697-42f2-b08d-5590c1d90f6a p. 2, last accessed Nov. 28, 2018.

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Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

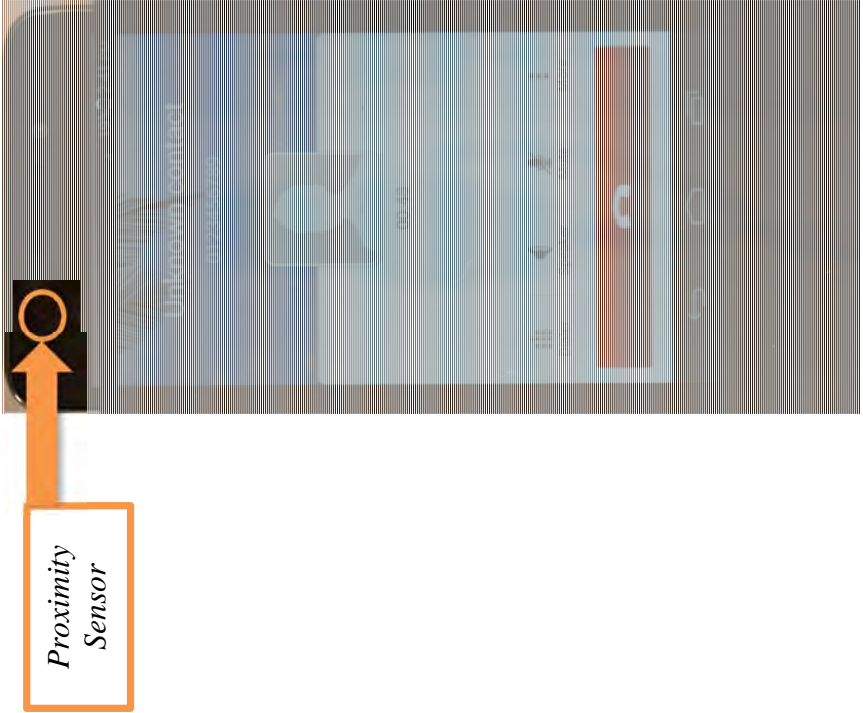
<p>[ii] a proximity sensor</p>	<p>The Huawei Pronto includes a proximity sensor.</p> 
<p>[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being</p>	<p>The proximity sensor of the Huawei Pronto is adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate.</p>

Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

that an external object is proximate;
and

By way of example only, the Huawei Pronto is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
-----------------------	----------	---	-------------------------------

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.

```

TYPE_PROXIMITY
public static final int TYPE_PROXIMITY
A constant describing a proximity sensor type. This is a wake up sensor.
See SensorEvent.values for more details.
See also:
isWakeUpSensor\(\)
Constant Value: 8 (0x00000008)
    
```

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the isWakeUpSensor file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:

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<p>added in API level 21</p> <p>isWakeUpSensor</p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p>	<p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor "to determine how far away a person's head is from the face of a handset device (for example, when a user making or receiving a phone call)."</p>
--	--

Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
--	--

Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

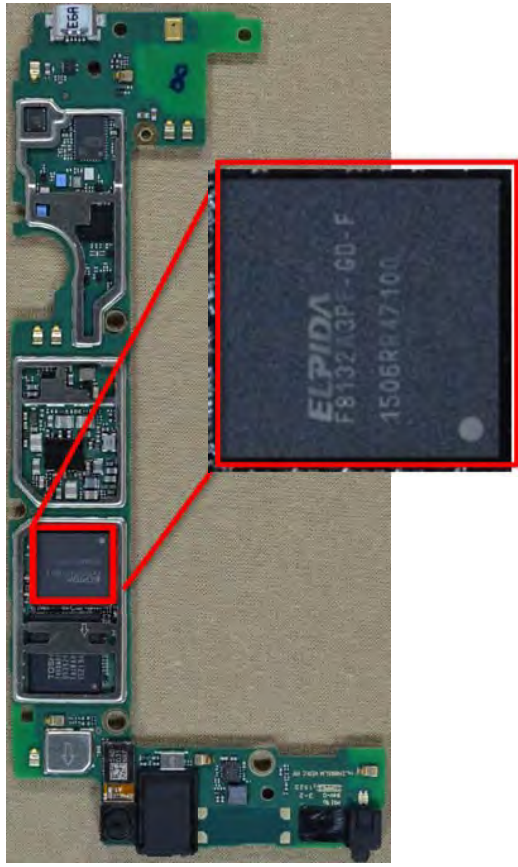
	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>	<p>[iv] a microprocessor adapted to:</p> <p>The Huawei Pronto includes at least one microprocessor.</p>
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BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

		<p><i>Snapdragon 400 MSM8926</i></p>
<p>(a) determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Pronto is adapted to determine without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p>	<p>The microprocessor is able to determine when the user initiates an outgoing call or answers an incoming call.</p>

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Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

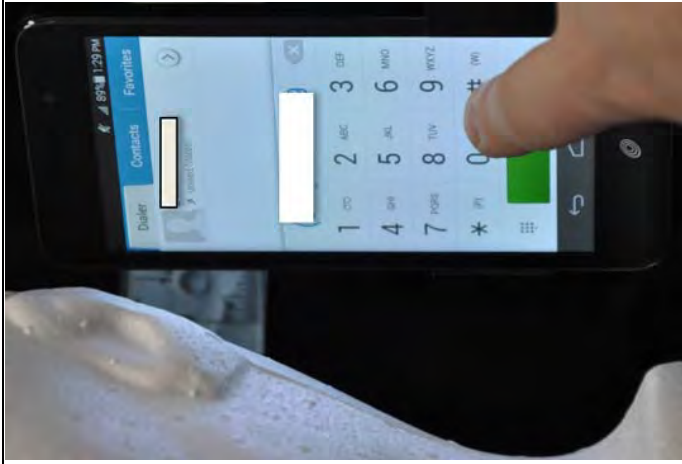
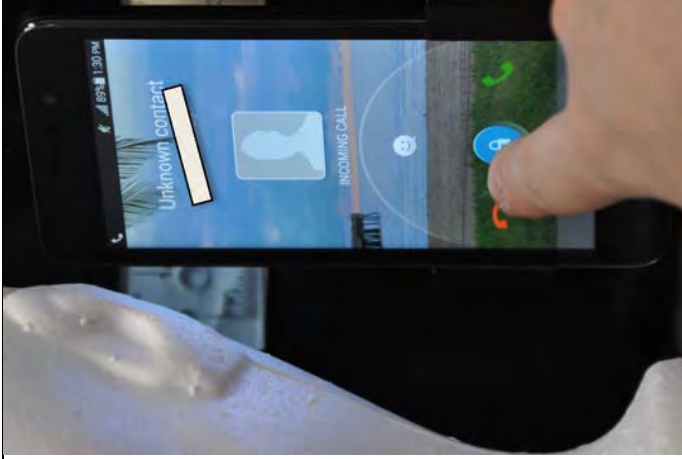
		
	<p>By way of example only, the Huawei Pronto is an Android phone. The Huawei Pronto's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;</p>	
	<p>Outgoing Call:</p>	

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```

/**
 * Broadcast receiver to detect the outgoing calls.
 */
public class OutgoingReceiver extends BroadcastReceiver {
    public OutgoingReceiver() {
    }

    @Override
    public void onReceive(Context context, Intent intent) {
        String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER);

        Toast.makeText(ctx,
            "Outgoing: "+number,
            Toast.LENGTH_LONG).show();
    }
}

```

In the above, the system sends a broadcast action `android.intent.action.NEW_OUTGOING_CALL`.

Incoming Call:

```

/**
 * Listener to detect incoming calls.
 */
private class CallStateListener extends PhoneStateListener {
    @Override
    public void onCallStateChanged(int state, String incomingNumber) {
        switch (state) {
            case TelephonyManager.CALL_STATE_RINGING:
                // called when someone is ringing to this phone
                Toast.makeText(ctx,
                    "Incoming: "+incomingNumber,
                    Toast.LENGTH_LONG).show();
                break;
        }
    }
}

```

In the above, state is the call state, where it may be `CALL_STATE_RINGING`, `CALL_STATE_OFFHOOK`, or `CALL_STATE_IDLE`. Ringing is the state when someone is calling,

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

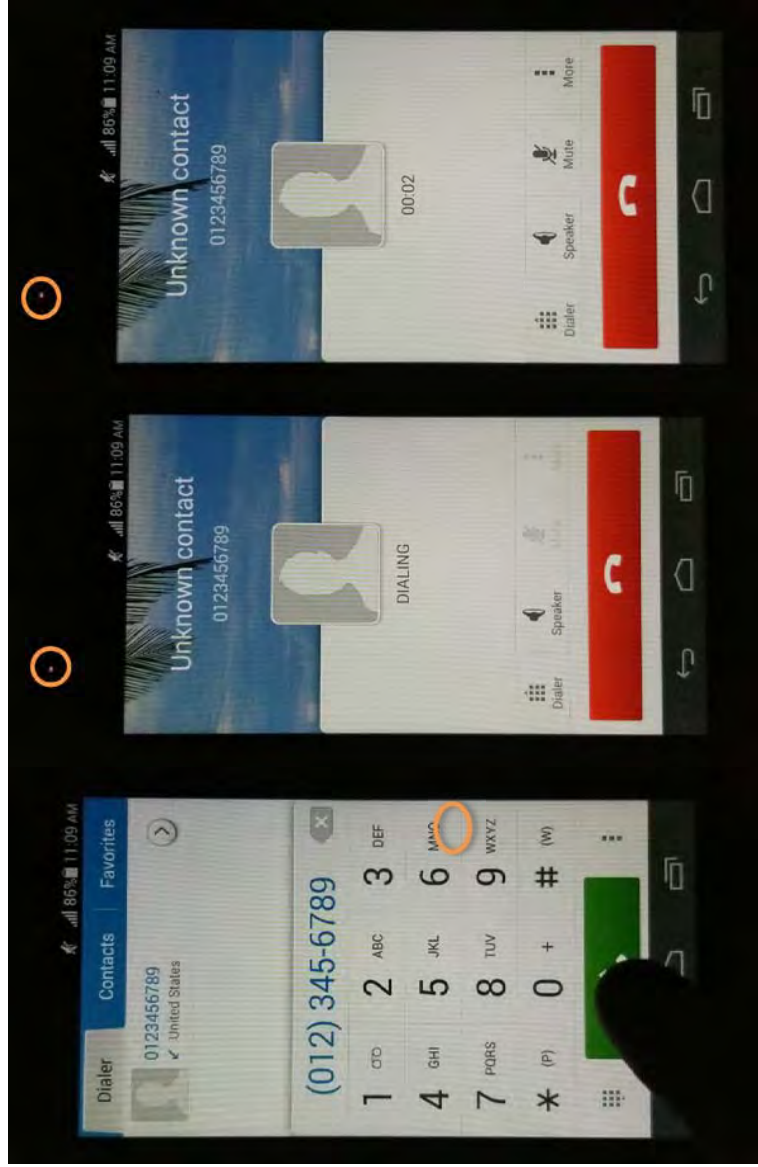
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	<p>offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Pronto is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is</p>

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activated. Third image shows the proximity sensor remains activated during the remainder of the call.



By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.

The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:

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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>	<pre>isWakeUpSensor public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>
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Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually.</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See <code>SensorManager.registerListener(SensorEventListener, Sensor, int, int)</code> for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Pronto, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Pronto is adapted to receive the signal from the activated proximity sensor.</p> <p>When the call button or answer button is pressed according to the above, the display darkens, indicated that the microprocessor received the signal from the activated proximity sensor that an object was proximate, and, in turn, reduced power to the display.</p>

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Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554



Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

By way of further example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:

```
TYPE_PROXIMITY
public static final int TYPE_PROXIMITY
A constant describing a proximity sensor type. This is a wake up sensor.
See SensorEvent.values for more details.
See also:
isWakeUpSensor()
Constant Value: 8 (0x0000000008)
```

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:

```
isWakeUpSensor
public boolean isWakeUpSensor ()
Returns true if the sensor is a wake-up sensor.
Application Processor Power modes
Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.
added in API level 21
```


Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p>	
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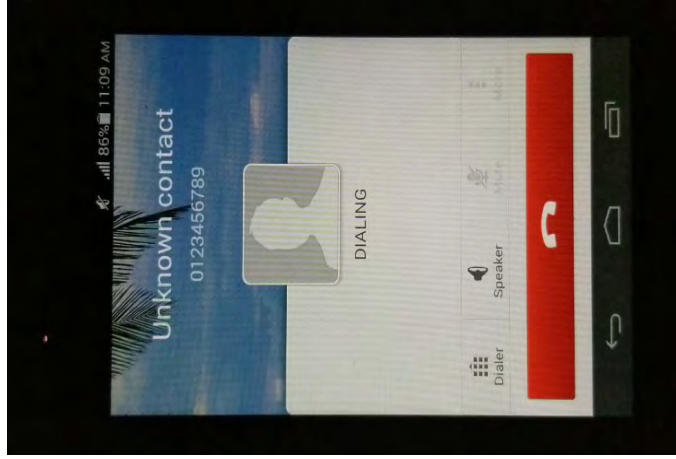
BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-8 –Infringement of U.S. Patent No. 8,204,554

(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

The microprocessor of the Huawei Pronto is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

By way of example only, the first image shows that the Huawei Pronto is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



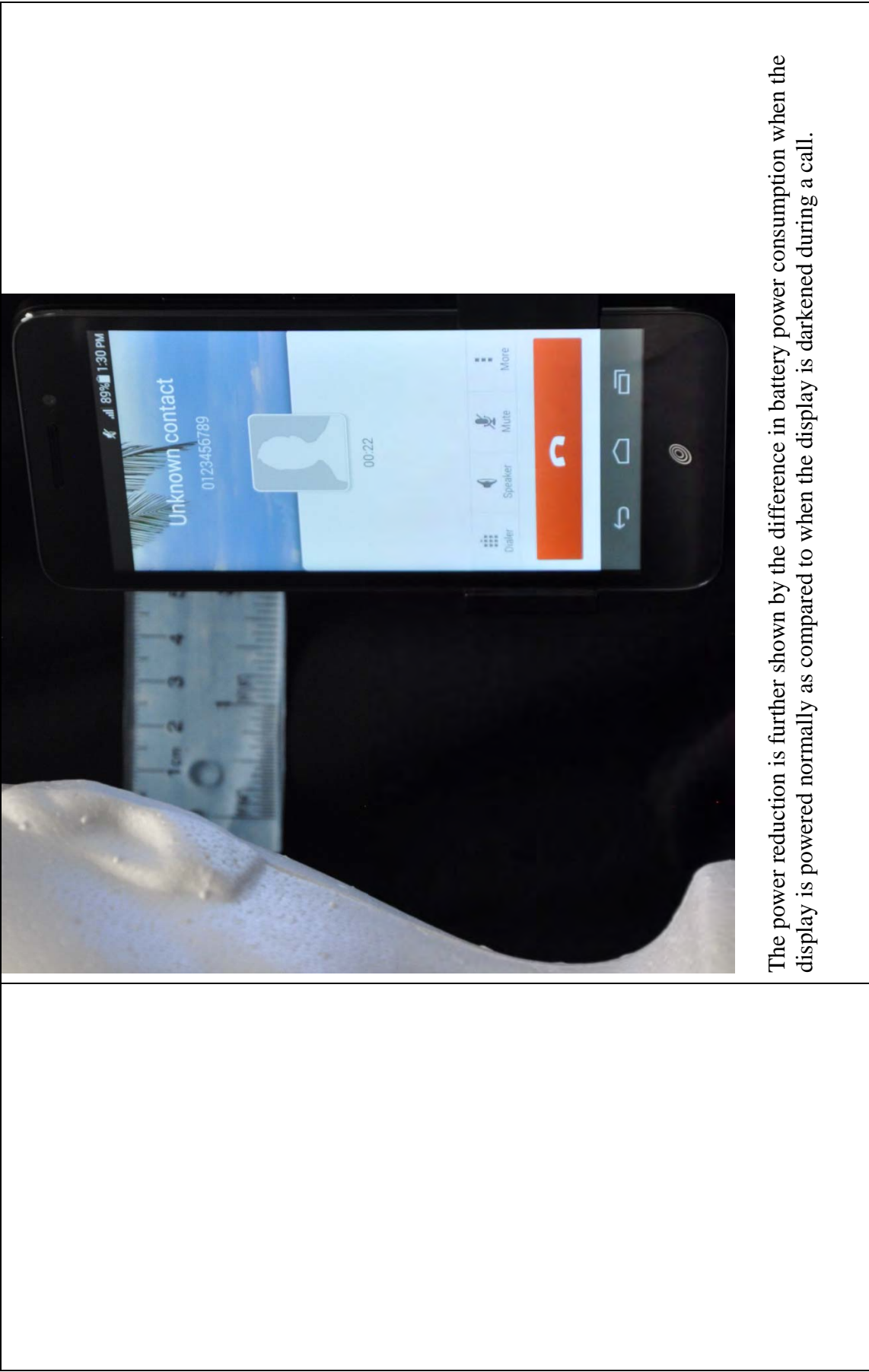
The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Pronto, power to the display is reduced and the display is darkened.



The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.

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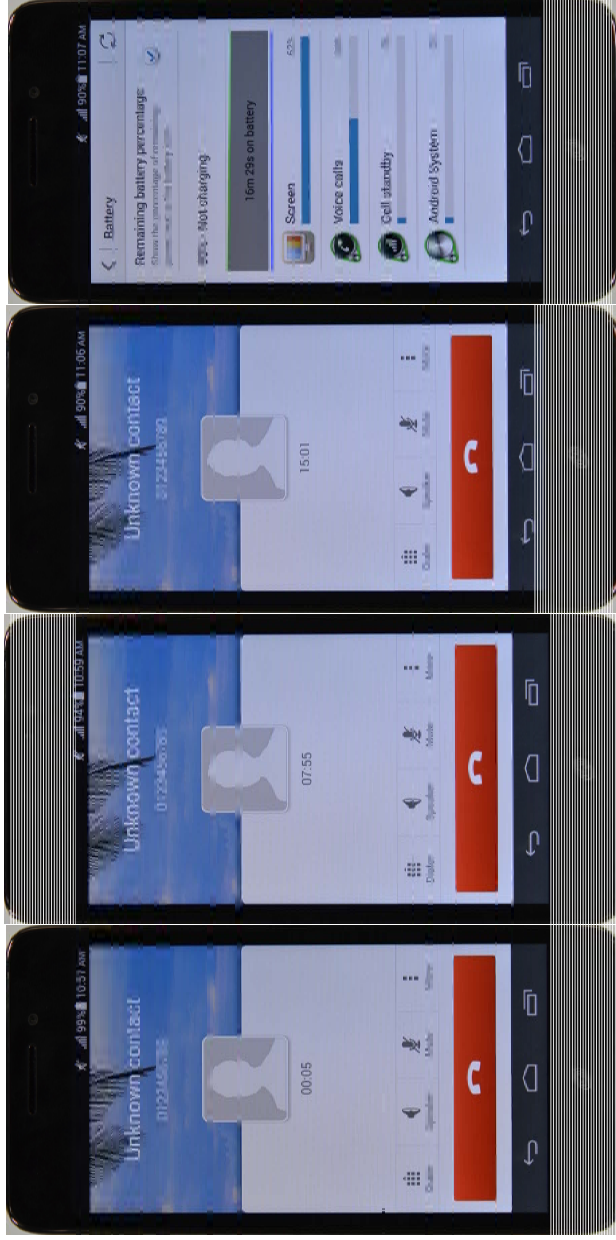
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The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.

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By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally.



When the call begins, the battery starts at a charge of 99%. After the call, the battery is still at 90%. The screen consumed 62% of the battery usage.

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The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.



When the call begins, the battery starts at a charge of 99%. After the call, the battery is still at 95%. The screen consumed 79% of the battery usage.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

By way of further example, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:

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	<div><p>TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</p><p>Phone position during a call.</p></div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”</p> <p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <div><pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre></div> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>
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Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

<pre>override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) }</pre>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>2. The mobile station of claim 1,</p>	<p>See claim 1.</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

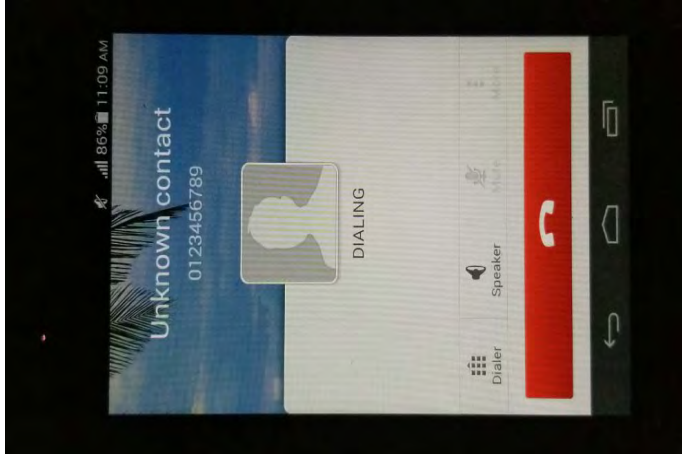
Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

The Huawei Pronto increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.

By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active.

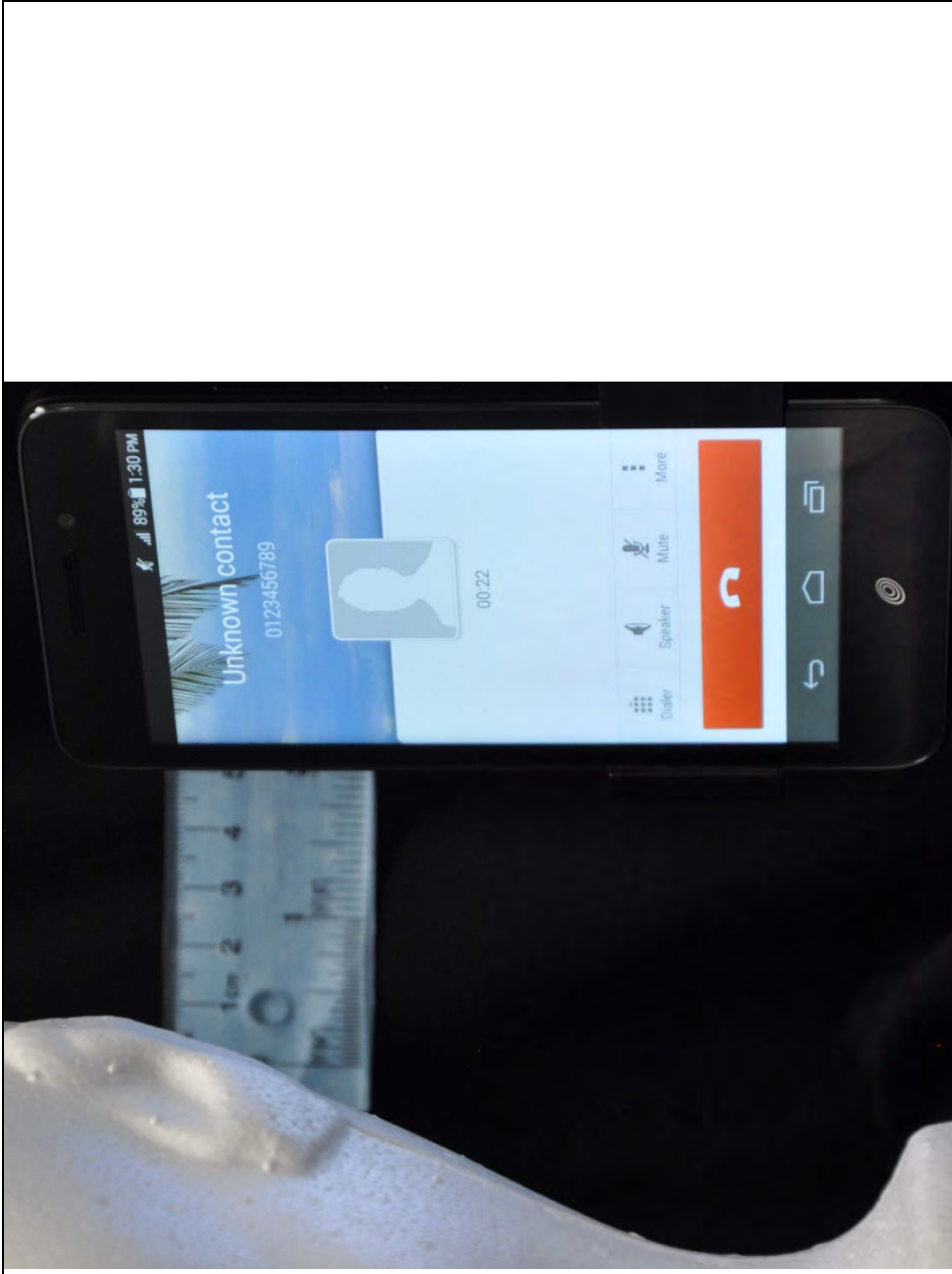
By way of example only, the first image shows that the Huawei Pronto is proximate to an object, but no call has been initiated or answered, so the display is powered normally.



The second image shows that, after the call button is pressed and the ear is proximate to the Huawei Pronto, power to the display is reduced and the display is darkened.



The third image shows that when the first condition does not exist (e.g., the ear is no longer proximate) even when a call has been initiated or answered, power to the display is not reduced and the display is powered normally.



By way of further example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person’s head is from the face of a handset device (for example, when a user is making or receiving a phone call).”

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.

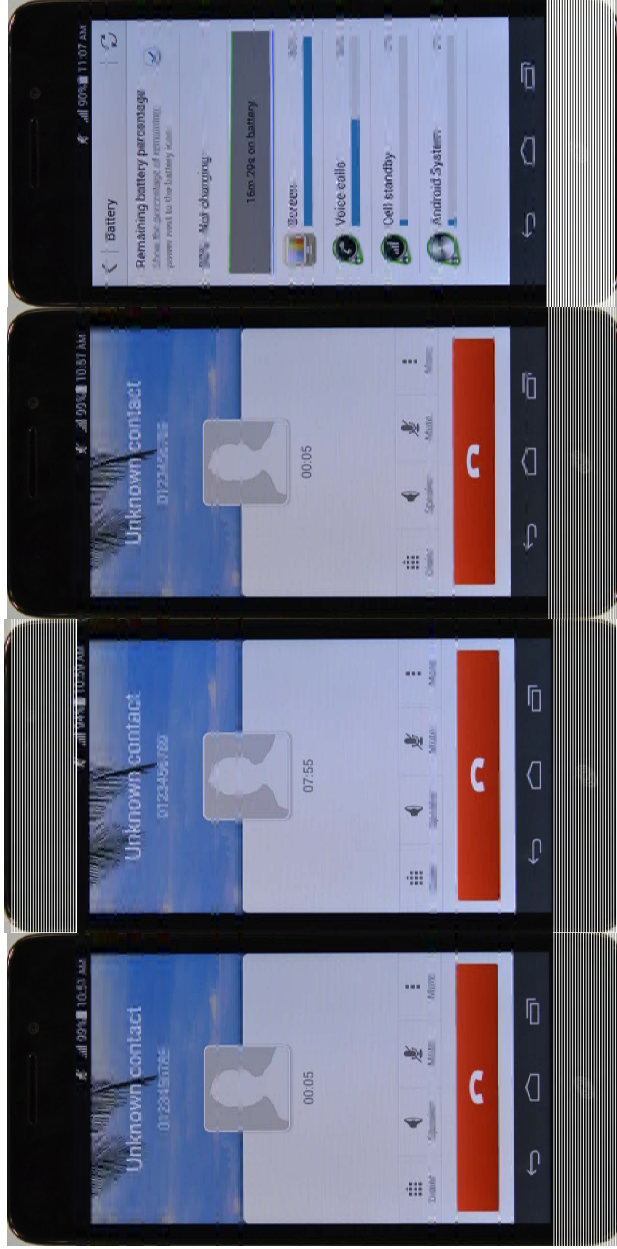
BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

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<p>4. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the microprocessor reduces power to the display by turning off the display.</p>	<p>The microprocessor of the Huawei Pronto reduces power to the display by turning off the display.</p> <p>When the call button or answer button is pressed and the ear is proximate to the Huawei Pronto, power to the display is reduced and the display is turned off.</p>  <p>The power reduction is further shown by the difference in battery power consumption when the display is powered normally as compared to when the display is darkened during a call.</p>

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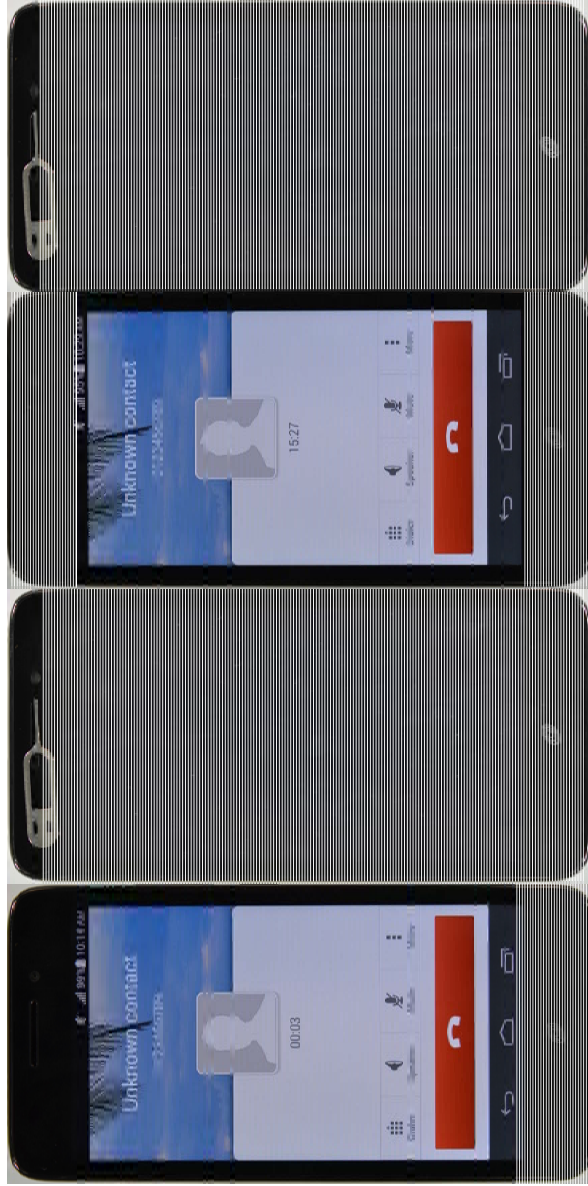
By way of example only, the following series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which no object was proximate, and the display remained powered normally.



When the call begins, the battery starts at a charge of 99%. After the call, the battery is still at 90%. The screen consumed 62% of the battery usage.

The next series shows computed power usage and battery power use during a call lasting approximately 15 minutes in which an object was proximate and power to the display was reduced during the call.

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When the call begins, the battery starts at a charge of 99%. After the call, the battery is still at 95%. The screen consumed 79% of the battery usage.

By way of further example only, the Android Developer Code Website describes the proximity sensor's signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:

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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x000000008)</p>	<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p>added in API level 21</p>
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Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See [SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See [https://developer.android.com/guide/topics/sensors/sensors_overview](https://developer.android.com/guide/topics/sensors/sensors/sensors_overview), last accessed November 29, 2018.

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<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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	KOTLIN	JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

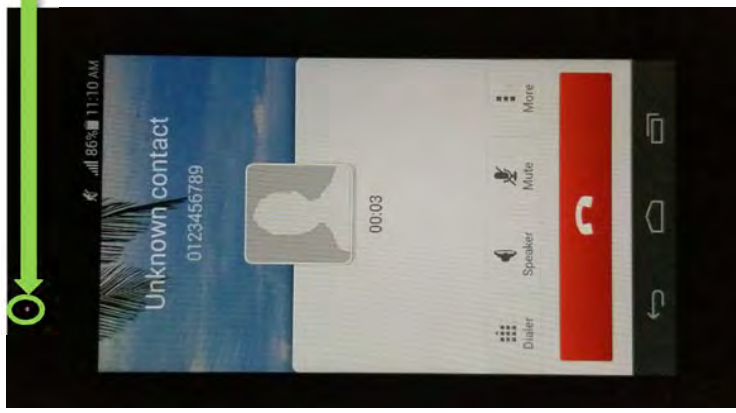
Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Pronto is a range-detecting sensor.</p>

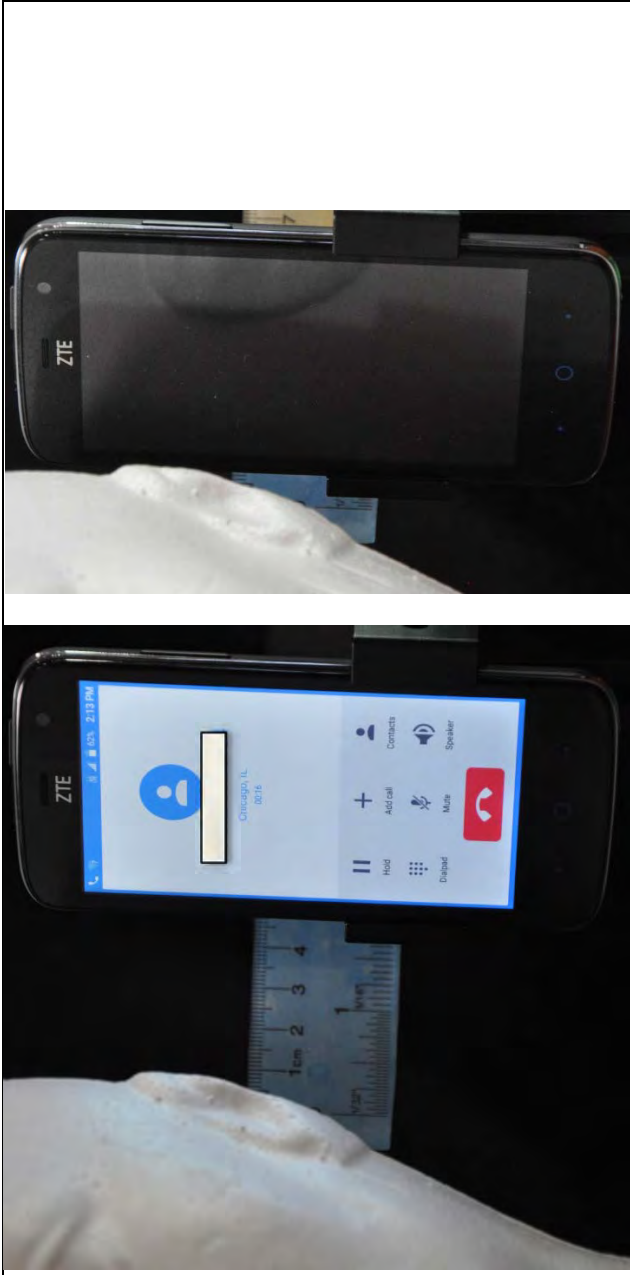
Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

The proximity sensor detects the range of a proximate object:

The optical range sensing proximity sensor emits Inf Red light senses the reflection to determine if external objects are proximate



By way of example only, when an incoming call is answered, and the device is not proximate to the object, approximately 6cm from the object the display is on. The mobile station is moved proximate to the ear, approximately 3cm the display is off.



By way of further example, the Android Developer Code Website describes range detection in proximity sensors:

TYPE_PROXIMITY

Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.

Phone position during a call.

See <https://developer.android.com/guide/topics/sensors/sensors/overview>, last accessed November 29, 2018.

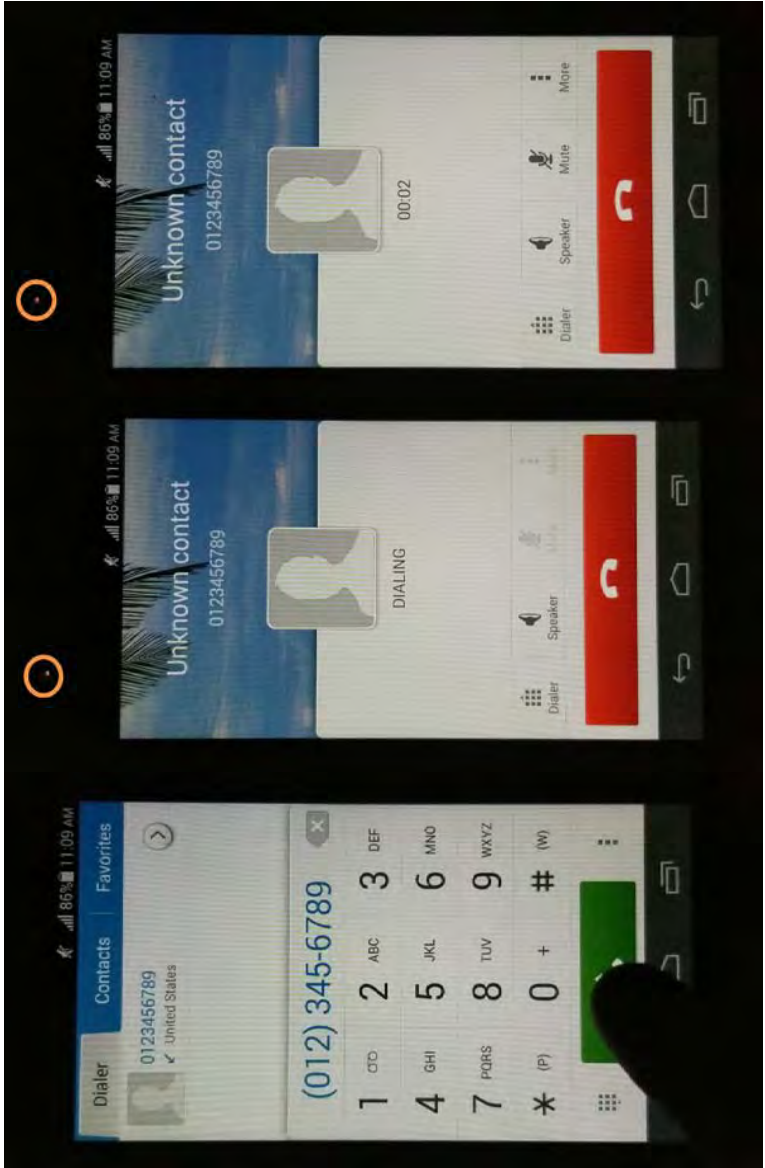
And also, the code shows distance measurement:

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	<pre>override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. }</pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>The Android Developer Code Website further explains:</p> <p>★ Note: Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the <code>getMaximumRange()</code> method.</p> <p><i>See id.</i></p>
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Exhibit B-8 – Infringement of U.S. Patent No. 8,204,554

<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The proximity sensor of the Huawei Pronto begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p> <p>The first image shows that when the user is about to initiate the call, at that point the proximity sensor is not activated. The second image shows the call initiated and the proximity sensor is activated. Third image shows the proximity sensor remains activated during the remainder of the call.</p>
	

In addition, by way of further example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating or receiving a call, including by providing exemplary code at least substantially similar to Huawei code:

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1 (preamble); I[ii]-[iii]; I(b)-(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call condition independent and different</p>	<p>The Huawei Pronto detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-8 –Infringement of U.S. Patent No. 8,204,554

<p>from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call;</p>	<p>See claim 1(a).</p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Pronto activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists. See claim 1(b).</p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Pronto reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists. See claim 1(c)-(d).</p>
<p>14. A mobile station, comprising:</p>	<p>See claim 1 (preamble).</p>
<p>a display;</p>	<p>See claim 1 [i].</p>
<p>a proximity sensor</p>	<p>See claim 1 [ii].</p>
<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p>See claim 1 [iii].</p>
<p>and a microprocessor adapted to:</p>	<p>See claim [iv].</p>

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Exhibit B-8 –Infringement of U.S. Patent No. 8,204,554

<p>(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Pronto is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call. See claim 1(a).</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>See claim 1(b).</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>See claim 1(c).</p>
<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p>See claim 1(d).</p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-9 – Infringement of U.S. Patent No. 8,204,554

Asserted Claim Elements	Huawei Vision 2
<p>1. A mobile station, comprising:</p>	<p>To the extent that the preamble is found to be limiting, the Huawei Vision 2 is a mobile station.</p> 

See

<https://www.consumercellular.com/Assets/documents/Manuals/Huawei%20Vision%20User%20Guide.pdf> , last accessed December 6, 2018.

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-9 – Infringement of U.S. Patent No. 8,204,554

[i] a display;

The Huawei Vision 2 includes a display.



See

<https://www.consumercellular.com/Assets/documents/Manuals/Huawei%20Vision%20%20User%20Guide.pdf>, last accessed December 6, 2018.

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-9 – Infringement of U.S. Patent No. 8,204,554

<p>[ii] a proximity sensor</p>	<p>The Huawei Vision 2 includes a proximity sensor.</p>  <p><i>See</i> https://www.consumercellular.com/Assets/documents/Manuals/Huawei%20Vision%20User%20Guide.pdf, last accessed December 6, 2018.</p>
<p>[iii] adapted to generate a signal indicative of the existence of a first</p>	<p>The proximity sensor of the Huawei Vision 2 is adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate</p>

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condition, the first condition being that an external object is proximate; and

By way of example only, the Huawei Vision 2 is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
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See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.

```

TYPE_PROXIMITY
public static final int TYPE_PROXIMITY
A constant describing a proximity sensor type. This is a wake up sensor.
See SensorEvent.values for more details.
See also:
isWakeUpSensor\(\)
Constant Value: 8 (0x00000008)
    
```

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the isWakeUpSensor file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:

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<p>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "suspend" mode, reducing the power consumption by 10 times or more.</p> <p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.	<p>added in API level 21</p>
<p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener (SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In addition, the Android Developer Code provides the following exemplary code at least substantially similar to HUAWEI code for using the proximity sensor "to determine how far away a person's head is from the face of a handset device (for example, when a user making or receiving a phone call)."</p>	

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Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>						
<p>[iv] a microprocessor adapted to:</p>	<p>The Huawei Vision 2 includes at least one microprocessor.</p> <table border="1"> <tr> <td>Processor</td> <td>Qualcomm Snapdragon 200</td> </tr> <tr> <td>CPU Cores</td> <td>2</td> </tr> <tr> <td>Processor Speed</td> <td>1.2GHz</td> </tr> </table> <p>See https://www.phonerated.com/specs-huawei-vision-2, last accessed December 6, 2018.</p>	Processor	Qualcomm Snapdragon 200	CPU Cores	2	Processor Speed	1.2GHz
Processor	Qualcomm Snapdragon 200						
CPU Cores	2						
Processor Speed	1.2GHz						
<p>(a) determine, without using the proximity sensor, the existence of a second condition independent and</p>	<p>The microprocessor of the Huawei Vision 2 is adapted to determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the</p>						

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different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;

second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.

By way of example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:

```

TYPE_PROXIMITY
public static final int TYPE_PROXIMITY
A constant describing a proximity sensor type. This is a wake up sensor.
See SensorEvent.values for more details.
See also:
isWakeUpSensor\(\)
Constant Value: 8 (0x0000000008)
    
```

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:

```

isWakeUpSensor
public boolean isWakeUpSensor ()
Returns true if the sensor is a wake-up sensor.
Application Processor Power modes
Application Processor (AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.
    
```

added in API level 21

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	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Vision 2 is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.</p> <p>The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:</p>

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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x000000008)</p> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>	<pre>isWakeUpSensor</pre> <p>added in API level 21</p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p>
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	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See <code>SensorManager.registerListener(SensorEventListener, Sensor, int, int)</code> for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Vision 2, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Vision 2 is adapted to receive the signal from the activated proximity sensor.</p> <p>By way of example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p>	<p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>	

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<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See <u>https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()</u>, last accessed November 29, 2018.</p>	
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BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

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(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

The microprocessor of the Huawei Vision 2 is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

By way of further example only, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:



See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to HUAWEI code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”

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Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

Exhibit B-9 – Infringement of U.S. Patent No. 8,204,554

KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>2. The mobile station of claim 1,</p>	<p>See claim 1.</p>

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<p>further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.</p>	<p>The Huawei Vision 2 increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.</p> <p>In Huawei Vision 2, when the device is moved away from the object, the display brightens and/or lights up, indicating that, when an external object is no longer proximate to the device, the power to the display is increased.</p> <p>By way of example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call).”</p> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.</p>
<p>4. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the microprocessor reduces power to the display by turning off the display.</p>	<p>The microprocessor of the Huawei Vision 2 reduces power to the display by turning off the display.</p> <p>By way of example only, the Android Developer Code Website describes the proximity sensor's signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor ()</p> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>		

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Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See `SensorManager.registerListener(SensorEventListener, Sensor, int, int)` for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See <https://developer.android.com/guide/topics/sensors/sensors/overview>, last accessed November 29, 2018.

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Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

Exhibit B-9 – Infringement of U.S. Patent No. 8,204,554

<pre>KOTLIN JAVA class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	
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Exhibit B-9 – Infringement of U.S. Patent No. 8,204,554

	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre>
<p>5. The mobile station as recited in claim 1,</p>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Vision 2 is a range-detecting sensor.</p> <p>By way of further example, the Android Developer Code Website describes range detection in proximity sensors:</p>

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<p>TYPE_PROXIMITY</p> <p>Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</p> <p>Phone position during a call.</p>	<p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>And also, the code shows distance measurement:</p> <pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>The Android Developer Code Website further explains:</p> <p>Note: Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the <code>getMaximumRange()</code> method.</p> <p>See <i>id.</i></p>
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Exhibit B-9 – Infringement of U.S. Patent No. 8,204,554

<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The proximity sensor of the Huawei Vision 2 begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p> <p>By way of example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating a call, including by providing exemplary code at least substantially similar to Huawei Code.</p>
	<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre> KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) </pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1 (preamble); 1[ii]-[iii]; 1(b)-(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call</p>	<p>The Huawei Vision 2 detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being</p>

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<p>condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call;</p>	<p>that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p> <p><i>See claim 1(a).</i></p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Vision 2 activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists.</p> <p><i>See claim 1(b).</i></p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Vision 2 reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p> <p><i>See claim 1(c)-(d).</i></p>
<p>14. A mobile station, comprising:</p>	<p><i>See claim 1(preamble).</i></p>
<p>a display;</p>	<p><i>See claim 1[i].</i></p>
<p>a proximity sensor</p>	<p><i>See claim 1[ii].</i></p>
<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p><i>See claim 1[iii].</i></p>

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<p>and a microprocessor adapted to:</p> <p>(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p><i>See claim[iv].</i></p> <p>The microprocessor of the Huawei Vision 2 is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p><i>See claim 1(a).</i></p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p><i>See claim 1(b).</i></p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p><i>See claim 1(c).</i></p>
<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p><i>See claim 1(d).</i></p>

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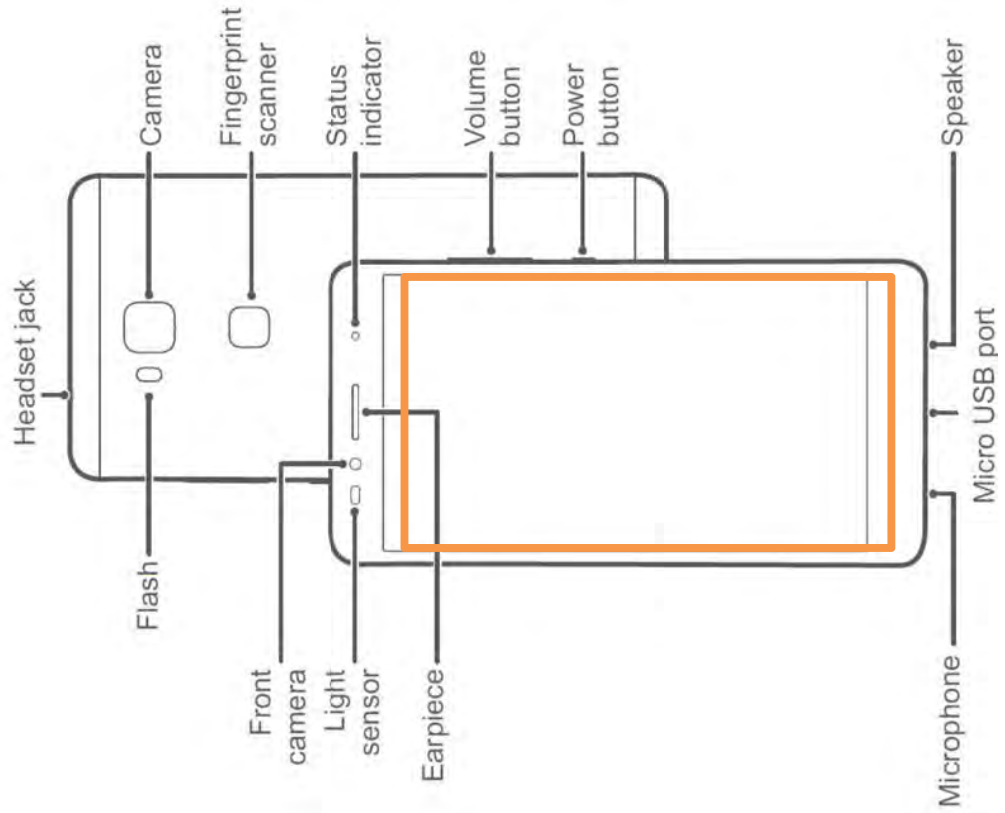
Exhibit B-10 –Infringement of U.S. Patent No. 8,204,554

Asserted Claim Elements	Huawei Honor 5x
<p>1. A mobile station, comprising:</p>	<p>To the extent that the preamble is found to be limiting, the Huawei Honor 5x is a mobile station.</p> <div></div> <p>See https://www.hihonor.com/us/product/10001646292075.html, last accessed December 4, 2018.</p>

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[i] a display;

The Huawei Honor 5x includes a display, outlined in the figure below.



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	<p>See http://consumer-tkb.huawei.com/ccpgw/msa/TKB/app_0000000000011227-CcpTKBknowOut/ctkbknowout/servlet/show/knowAttachmentServlet?knowId=en-us00443446, p. 3, last accessed December 4, 2018.</p>
<p>[ii] a proximity sensor</p>	<p>The Huawei Honor 5x includes a proximity sensor.</p>  <p>FEATURES Sensors: Accelerometer, proximity, compass SIM : Dual SIM (Micro-SIM, dual stand-by)</p> <p>Huawei Honor X5; Fingerprint, Accelerometer, Proximity, Compass Size 5.5 inches</p>

See <https://www.youtube.com/watch?v=aoCotiH4yrQ>, last accessed December 4, 2018.

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<p>[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate; and</p>	<p>The proximity sensor of the Huawei Honor 5x is adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate.</p> <p>By way of example only, the Huawei Honor 5X is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:</p> <div style="border: 1px solid black; padding: 5px;"> <p>TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</p> <p style="text-align: right; margin-right: 20px;">Phone position during a call.</p> </div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.</p> <div style="border: 1px solid black; padding: 5px;"> <pre> TYPE_PROXIMITY public static final int TYPE_PROXIMITY A constant describing a proximity sensor type. This is a wake up sensor. See SensorEvent.values for more details. See also: isWakeUpSensor() Constant Value: 8 (0x00000008) </pre> </div> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p>
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The referenced discussion concerning the isWakeUpSensor file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:

added in API level 21

```
isWakeUpSensor
public boolean isWakeUpSensor ()
```

Returns true if the sensor is a wake-up sensor.

Application Processor Power modes

Application Processor (AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "suspend" mode, reducing the power consumption by 10 times or more.

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent maxFifoEventCount() == 0, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's onPause method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

[SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor "to determine how far away a person's head is from the face of a handset device (for example, when a user making or receiving a phone call)."

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Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>[iv] a microprocessor adapted to:</p>	<p>The Huawei Honor 5x includes at least one microprocessor.</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;"> <p>Combination of 2 GB RAM and a Qualcomm 64-bit Octa-core processor for a smooth responsive experience</p> </div> <p>See https://www.hihonor.com/us/product/10001646292075.html, last accessed December 4, 2018.</p>
<p>(a) determine, without using the proximity sensor, the existence of a</p>	<p>The microprocessor of the Huawei Honor 5x is adapted to determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the</p>

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second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;

second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.

By way of example only, the Huawei Honor 5X is an Android phone. The Huawei Honor 5X's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;

Outgoing Call:

```
/**  
 * Broadcast receiver to detect the outgoing calls.  
 */  
public class OutgoingReceiver extends BroadcastReceiver {  
    public OutgoingReceiver() {  
    }  
    @Override  
    public void onReceive(Context context, Intent intent) {  
        String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER);  
        Toast.makeText(ctx,  
            "Outgoing: "+number,  
            Toast.LENGTH_LONG).show();  
    }  
}
```

In the above, the system sends a broadcast action `android.intent.action.NEW_OUTGOING_CALL`.

Incoming Call:

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	<pre> /** * Listener to detect incoming calls. */ private class CallStateListener extends PhoneStateListener { @Override public void onCallStateChanged(int state, String incomingNumber) { switch (state) { case TelephonyManager.CALL_STATE_RINGING: // called when someone is ringing to this phone Toast.makeText(ctx, "Incoming: "+incomingNumber, Toast.LENGTH_LONG).show(); break; } } } } </pre> <p>In the above, state is the call state, where it may be CALL_STATE_RINGING, CALL_STATE_OFFHOOK, or CALL_STATE_IDLE. Ringing is the state when someone is calling, offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Honor 5x is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.</p> <p>The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:</p>

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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>	<pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>
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	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See <code>SensorManager.registerListener(SensorEventListener, Sensor, int, int)</code> for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Honor 5x, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Honor 5X is adapted to receive the signal from the activated proximity sensor.</p> <p>By way of example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>
	<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p>
<p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>	<pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p><small>added in API level 21</small></p>

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	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See <code>SensorManager.registerListener(SensorEventListener, Sensor, int, int)</code> for more details.</p> <p>See <u>https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()</u>, last accessed November 29, 2018.</p> <p>In the Huawei Honor 5X, when the call button or answer button is pressed, the display darkens, indicating that the microprocessor received the signal from the activated proximity sensor that an object was proximate.</p>
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<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p>The microprocessor of the Huawei Honor 5X is adapted to reduce power to the display if (i) the microprocessor determines that a telephone call is active and (ii) the signal indicates the proximity of the external object.</p> <p>By way of example only, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:</p> <table border="1"><tr><td>TYPE_PROXIMITY</td><td>Hardware</td><td>Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</td><td>Phone position during a call.</td></tr></table> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”</p>	TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.		

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Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>2. The mobile station of claim 1,</p>	<p>See claim 1.</p>

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<p>further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.</p>	<p>The Huawei Honor 5x increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.</p> <p>In Huawei Honor 5x, when the device is moved away from the object, the display brightens and/or lights up, indicating that, when an external object is no longer proximate to the device, the power to the display is increased.</p> <p>By way of example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person’s head is from the face of a handset device (for example, when a user is making or receiving a phone call).”</p> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.</p>
<p>4. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the microprocessor reduces power to the display by turning off the display.</p>	<p>The microprocessor of the Huawei Honor 5x reduces power to the display by turning off the display.</p> <p>By way of example only, the Android Developer Code Website describes the proximity sensor’s signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor ()</p> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>		

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Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See `SensorManager.registerListener(SensorEventListener, Sensor, int, int)` for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

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<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Honor 5X is a range-detecting sensor. By way of example only, the Android Developer Code Website describes range detection in proximity sensors:</p>

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	<div style="border: 1px solid #ccc; padding: 5px;"> <p>TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear. Phone position during a call.</p> </div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>And also, the code shows distance measurement:</p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9;"> <pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } </pre> </div> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>The Android Developer Code Website further explains:</p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #e0f2f7;"> <p>★ Note: Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the <code>getMaximumRange()</code> method.</p> </div> <p>See <i>id.</i></p>
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<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The proximity sensor of the Huawei Honor 5X begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p> <p>By way of example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating a call, including by providing exemplary code at least substantially similar to Huawei code:</p>
	<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre> KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) </pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1 (preamble); 1[ii]-[iii]; 1(b)-(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call</p>	<p>The Huawei Honor 5x detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being</p>

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<p>condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p>	<p>that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p> <p><i>See claim 1 (a).</i></p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Honor 5x activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists.</p> <p><i>See claim 1 (b).</i></p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Honor 5x reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p> <p><i>See claim 1 (c)-(d).</i></p>
<p>14. A mobile station, comprising:</p>	<p><i>See claim 1 (preamble).</i></p>
<p>a display;</p>	<p><i>See claim 1 [i].</i></p>
<p>a proximity sensor</p>	<p><i>See claim 1 [ii].</i></p>
<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p><i>See claim 1 [iii].</i></p>

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and a microprocessor adapted to:	<i>See claim[iv].</i>	
(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;	The microprocessor of the Huawei Honor 5x is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call. <i>See claim 1(a).</i>	
(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,	<i>See claim 1(b).</i>	
(c) receive the signal from the activated proximity sensor, and	<i>See claim 1(c).</i>	
(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.	<i>See claim 1(d).</i>	

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Asserted Claim Elements	Huawei Honor 6x
<p>1. A mobile station, comprising:</p>	<p>To the extent that the preamble is found to be limiting, the Huawei Honor 6x is a mobile station.</p> <div>A white Huawei Honor 6x smartphone is shown from a front-facing perspective. The screen displays a lock screen with a blue and yellow camera-themed background. The background features two camera lenses with yellow accents and a large yellow 'X' shape. The time '10:08' and the date 'Tue 18 Oct' are visible on the screen. The 'honor' logo is at the bottom of the screen. The phone has a white bezel and a silver back.</div> <p>See https://www.hihonor.com/us/product/10001911052020.html#1000000100082, last accessed December 4, 2018.</p>

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[i] a display;

The Huawei Honor 6x includes a display, outlined in the figure below.



See <https://www.hihonor.com/us/product/10001911052020.html#1000000100082>, last accessed December 4, 2018.

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<p>[ii] a proximity sensor</p>	<p>The Huawei Honor 6x includes a proximity sensor.</p> <p>SPECIFICATIONS</p> <p>SENSOR Hall effect sensor, Fingerprint sensor, Proximity sensor, Ambient light sensor, Compass, Accelerometer, Phone status indicator</p> <p>See https://www.hihonor.com/us/product/10001911052020.html#1000000100082, last accessed December 4, 2018.</p>
<p>[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p>The proximity sensor of the Huawei Honor 6X is adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate.</p> <p>By way of example only, the Huawei Honor 6X is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:</p> <div style="border: 1px solid black; padding: 5px;"> <p>TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear. Phone position during a call.</p> </div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <pre>isWakeUpSensor()</pre> <p>Constant Value: 8 (0x00000008)</p> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:</p> <pre>isWakeUpSensor</pre> <p>public boolean isWakeUpSensor ()</p> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p>added in API level 21</p>
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Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

[SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (for example, when a user making or receiving a phone call).”

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	<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>
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	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

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	<pre>override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) }</pre>
[iv] a microprocessor adapted to:	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>The Huawei Honor 6x includes at least one microprocessor.</p> <p>CPU Model:Huawei Kirin 655,Octa-Core (4x2.1GHz+4x1.7GHz)</p> <p>See https://www.hihonor.com/us/product/10001646292075.html, last accessed December 4, 2018.</p>

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<p>(a) determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Honor 6X is adapted to determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p>
<p>By way of example only, the Huawei Honor 6X is an Android phone. The Huawei Honor 6X's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;</p>	<p>By way of example only, the Huawei Honor 6X is an Android phone. The Huawei Honor 6X's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;</p>
<p>Outgoing Call:</p>	<p>Outgoing Call:</p>
<pre>/** * Broadcast receiver to detect the outgoing calls. */ public class OutgoingReceiver extends BroadcastReceiver { public OutgoingReceiver() { } @Override public void onReceive(Context context, Intent intent) { String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER); Toast.makeText(ctx, "Outgoing: "+number, Toast.LENGTH_LONG).show(); } }</pre>	<pre>/** * Broadcast receiver to detect the outgoing calls. */ public class OutgoingReceiver extends BroadcastReceiver { public OutgoingReceiver() { } @Override public void onReceive(Context context, Intent intent) { String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER); Toast.makeText(ctx, "Outgoing: "+number, Toast.LENGTH_LONG).show(); } }</pre>
<p>In the above, the system sends a broadcast action android.intent.action.NEW_OUTGOING_CALL.</p>	<p>In the above, the system sends a broadcast action android.intent.action.NEW_OUTGOING_CALL.</p>
<p>Incoming Call:</p>	<p>Incoming Call:</p>

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<pre> /** * Listener to detect incoming calls. */ private class CallStateListener extends PhoneStateListener { @Override public void onCallStateChanged(int state, String incomingNumber) { switch (state) { case TelephonyManager.CALL_STATE_RINGING: // called when someone is ringing to this phone Toast.makeText(ctx, "Incoming: "+incomingNumber, Toast.LENGTH_LONG).show(); break; } } } } </pre>	<p>In the above, state is the call state, where it may be CALL_STATE_RINGING, CALL_STATE_OFFHOOK, or CALL_STATE_IDLE. Ringing is the state when someone is calling, offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Honor 6x is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.</p> <p>The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:</p>

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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p>
<p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>	<p>added in API level 21</p> <pre>isWakeUpSensor</pre> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p>

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	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Honor 6x, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Honor 6X is adapted to receive the signal from the activated proximity sensor.</p> <p>By way of example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p>	<p>The referenced discussion concerning the <code>isWakeUpSensor</code> file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor</pre> <p><small>added in API level 21</small></p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "suspend" mode, reducing the power consumption by 10 times or more.</p>

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<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p>	<p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Honor 6X, when the call button or answer button is pressed, the display darkens, indicating that the microprocessor received the signal from the activated proximity sensor that an object was proximate.</p>
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<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p>The microprocessor of the Huawei Honor 6X is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p> <p>By way of example only, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:</p> <table border="1"><tr><td><p>TYPE_PROXIMITY</p></td><td><p>Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</p></td><td><p>Phone position during a call.</p></td></tr></table> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”</p>	<p>TYPE_PROXIMITY</p>	<p>Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</p>	<p>Phone position during a call.</p>
<p>TYPE_PROXIMITY</p>	<p>Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</p>	<p>Phone position during a call.</p>		

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Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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<pre>override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) }</pre>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>2. The mobile station of claim 1,</p>	<p>See claim 1.</p>

<p>further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.</p>	<p>The Huawei Honor 6x increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.</p> <p>In Huawei Honor 6x, when the device is moved away from the object, the display brightens and/or lights up, indicating that, when an external object is no longer proximate to the device, the power to the display is increased.</p> <p>By way of example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call).”</p> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.</p>
<p>4. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the microprocessor reduces power to the display by turning off the display.</p>	<p>The microprocessor of the Huawei Honor 6X reduces power to the display by turning off the display.</p> <p>By way of example only, the Android Developer Code Website describes the proximity sensor's signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:</p> <div style="border: 1px solid black; padding: 10px;"> <pre> TYPE_PROXIMITY public static final int TYPE_PROXIMITY A constant describing a proximity sensor type. This is a wake up sensor. See SensorEvent.values for more details. See also: isWakeUpSensor() Constant Value: 8 (0x00000008) </pre> </div>

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See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:

isWakeUpSensor added in API level 21

public boolean isWakeUpSensor ()

Returns true if the sensor is a wake-up sensor.

Application Processor Power modes

Application Processor (AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent, maxFifoEventCount() == 0, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's onPause method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

[SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

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Sensor	Type	Description	Common Uses
TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See <https://developer.android.com/guide/topics/sensors/sensors/overview>, last accessed November 29, 2018.

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```

KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
    
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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	<pre>KOTLIN JAVA class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>
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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>				
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>				
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Honor 6X is a range-detecting sensor.</p> <p>By way of example only, the Android Developer Code Website describes range detection in proximity sensors:</p> <div style="border: 1px solid black; padding: 5px;"> <table border="0"> <tr> <td style="vertical-align: top;">TYPE_PROXIMITY</td> <td style="vertical-align: top;">Hardware</td> <td style="vertical-align: top;">Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</td> <td style="vertical-align: top;">Phone position during a call.</td> </tr> </table> </div>	TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.		

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See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

And also, the code shows distance measurement:

```
override fun onSensorChanged(event: SensorEvent) {  
    val distance = event.values[0]  
    // Do something with this sensor data.  
}
```

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.

The Android Developer Code Website further explains:

★ **Note:** Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the `getMaximumRange()` method.

See *id.*

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<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The proximity sensor of the Huawei Honor 6X begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p> <p>By way of example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating a call, including by providing exemplary code at least substantially similar to Huawei code:</p>
	<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre> KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) </pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1 (preamble); 1[ii]-[iii]; 1(b)-(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call</p>	<p>The Huawei Honor 6x detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being</p>

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<p>condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p>	<p>that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p> <p><i>See claim 1 (a).</i></p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Honor 6x activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists.</p> <p><i>See claim 1 (b).</i></p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Honor 6x reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p> <p><i>See claim 1 (c)-(d).</i></p>
<p>14. A mobile station, comprising:</p>	<p><i>See claim 1 (preamble).</i></p>
<p>a display;</p>	<p><i>See claim 1 [i].</i></p>
<p>a proximity sensor</p>	<p><i>See claim 1 [ii].</i></p>
<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p><i>See claim 1 [iii].</i></p>

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<p>and a microprocessor adapted to:</p> <p>(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p><i>See claim [iv].</i></p> <p>The microprocessor of the Huawei Honor 6x is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p><i>See claim 1(a).</i></p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p><i>See claim 1(b).</i></p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p><i>See claim 1(c).</i></p>
<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p><i>See claim 1(d).</i></p>

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Exhibit B-12 –Infringement of U.S. Patent No. 8,204,554

Asserted Claim Elements	Huawei Honor 7x
<p>1. A mobile station, comprising:</p>	<p>To the extent that the preamble is found to be limiting, the Huawei Honor 7X is a mobile station.</p> <div></div> <p>See https://www.hihonor.com/us/product/10001933050073.html#1000000100062, last accessed December 5, 2018.</p>

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[i] a display;

The Huawei Honor 7X includes a display, outlined in the figure below.



See <https://www.hihonor.com/us/product/10001933050073.html#1000000100062>, last accessed December 5, 2018.

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<p>[ii] a proximity sensor</p>	<p>The Huawei Honor 7x includes a proximity sensor.</p> <p>SPECIFICATIONS</p> <p>SENSOR Fingerprint sensor, Proximity sensor, Ambient light sensor, Compass, Gravity sensor, Phone status indicator</p> <p>See https://www.hihonor.com/us/product/10001933050073.html#1000000100062, last accessed December 5, 2018.</p>
<p>[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate; and</p>	<p>The proximity sensor of the Huawei Honor 7x is adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate.</p> <p>By way of example only, the Huawei Honor 7X is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:</p> <div style="border: 1px solid black; padding: 5px;"> <p>TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear. Phone position during a call.</p> </div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>		

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Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

[SensorManager.registerListener\(SensorEventListener, Sensor, int, int\)](#) for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (for example, when a user making or receiving a phone call).”

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<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>[iv] a microprocessor adapted to:</p>	<p>The Huawei Honor 7x includes at least one microprocessor. CPU Model:Kirin 695,CPU Cores:Octa-Core(4*2.36GHz+4*1.7GHz)</p> <p>See https://www.hihonor.com/us/product/10001933050073.html#1000000100062, last accessed December 5, 2018.</p>
<p>(a) determine, without using the proximity sensor, the existence of a</p>	<p>The microprocessor of the Huawei Honor 7X is adapted to determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the</p>

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second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;

second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.

By way of example only, the Huawei Honor 7X is an Android phone. The Huawei Honor 7X's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;

Outgoing Call:

```
/**  
 * Broadcast receiver to detect the outgoing calls.  
 */  
public class OutgoingReceiver extends BroadcastReceiver {  
    public OutgoingReceiver() {  
    }  
    @Override  
    public void onReceive(Context context, Intent intent) {  
        String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER);  
        Toast.makeText(ctx,  
            "Outgoing: "+number,  
            Toast.LENGTH_LONG).show();  
    }  
}
```

In the above, the system sends a broadcast action `android.intent.action.NEW_OUTGOING_CALL`.

Incoming Call:

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	<pre> /** * Listener to detect incoming calls. */ private class CallStateListener extends PhoneStateListener { @Override public void onCallStateChanged(int state, String incomingNumber) { switch (state) { case TelephonyManager.CALL_STATE_RINGING: // called when someone is ringing to this phone Toast.makeText(ctx, "Incoming: "+incomingNumber, Toast.LENGTH_LONG).show(); break; } } } </pre> <p>In the above, state is the call state, where it may be CALL_STATE_RINGING, CALL_STATE_OFFHOOK, or CALL_STATE_IDLE. Ringing is the state when someone is calling, offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Honor 7X is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.</p> <p>The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:</p>

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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>	<pre>isWakeUpSensor</pre> <p>added in API level 21</p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p>
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	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See <code>SensorManager.registerListener(SensorEventListener, Sensor, int, int)</code> for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Honor 7X, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Honor 7X is adapted to receive the signal from the activated proximity sensor.</p> <p>By way of example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p>	<p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p><small>added in API level 21</small></p>	

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	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See <code>SensorManager.registerListener(SensorEventListener, Sensor, int, int)</code> for more details.</p> <p>See <u>https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()</u>, last accessed November 29, 2018.</p> <p>In the Huawei Honor 7X, when the call button or answer button is pressed, the display darkens, indicating that the microprocessor received the signal from the activated proximity sensor that an object was proximate.</p>
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<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p>The microprocessor of the Huawei Honor 7X is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p> <p>By way of example only, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:</p> <div><p>TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</p><p>Phone position during a call.</p></div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”</p>
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<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>	<p>2. The mobile station of claim 1,</p> <p>See claim 1.</p>
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<p>further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.</p>	<p>The Huawei Honor 7x increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.</p> <p>In Huawei Honor 7x, when the device is moved away from the object, the display brightens and/or lights up, indicating that, when an external object is no longer proximate to the device, the power to the display is increased.</p> <p>By way of example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person’s head is from the face of a handset device (for example, when a user is making or receiving a phone call).”</p> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.</p>
<p>4. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the microprocessor reduces power to the display by turning off the display.</p>	<p>The microprocessor of the Huawei Honor 7X reduces power to the display by turning off the display.</p> <p>By way of example only, the Android Developer Code Website describes the proximity sensor’s signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>		

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Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See `SensorManager.registerListener(SensorEventListener, Sensor, int, int)` for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

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<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	
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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Honor 7X is a range-detecting sensor. By way of example only, the Android Developer Code Website describes range detection in proximity sensors:</p>

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	<div style="border: 1px solid #ccc; padding: 5px;"> <p>TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear. Phone position during a call.</p> </div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>And also, the code shows distance measurement:</p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9;"> <pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } </pre> </div> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>The Android Developer Code Website further explains:</p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #e0f2f7;"> <p>★ Note: Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the <code>getMaximumRange()</code> method.</p> </div> <p>See <i>id.</i></p>
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<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>The proximity sensor of the Huawei Honor 7X begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p> <p>By way of example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating a call, including by providing exemplary code at least substantially similar to Huawei code:</p>
	<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre> KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) </pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1 (preamble); 1[ii]–[iii]; 1(b)–(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call</p>	<p>The Huawei Honor 7x detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being</p>

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<p>condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p> <p><i>See claim 1 (a).</i></p>	<p>condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call;</p>
<p>The Huawei Honor 7x activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists.</p> <p><i>See claim 1 (b).</i></p>	<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>
<p>The Huawei Honor 7x reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p> <p><i>See claim 1 (c)-(d).</i></p>	<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>
<p><i>See claim 1 (preamble).</i></p>	<p>14. A mobile station, comprising:</p>
<p><i>See claim 1 [i].</i></p>	<p>a display;</p>
<p><i>See claim 1 [ii].</i></p>	<p>a proximity sensor</p>
<p><i>See claim 1 [iii].</i></p>	<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>

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and a microprocessor adapted to:	<i>See claim[iv].</i>	
(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;	The microprocessor of the Huawei Honor 7x is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call. <i>See claim 1(a).</i>	
(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,	<i>See claim 1(b).</i>	
(c) receive the signal from the activated proximity sensor, and	<i>See claim 1(c).</i>	
(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.	<i>See claim 1(d).</i>	

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Asserted Claim Elements	Huawei Honor 8
<p>1. A mobile station, comprising:</p>	<p>To the extent that the preamble is found to be limiting, the Huawei Honor 8 is a mobile station.</p>  <p>The image shows a white Huawei Honor 8 smartphone. The screen displays the Android home screen with a dark blue background. At the top, the status bar shows 'No service', signal strength, Wi-Fi, and battery icons, along with the time '10:17'. The main screen features a 'Google' search bar at the top. Below it, there are several app icons arranged in a grid: Google, Gmail, Maps, YouTube, Play Music, Drive, Hangouts, Photos, and Play Movies & TV. The phone has a white bezel and the 'honor' logo is visible at the bottom.</p>

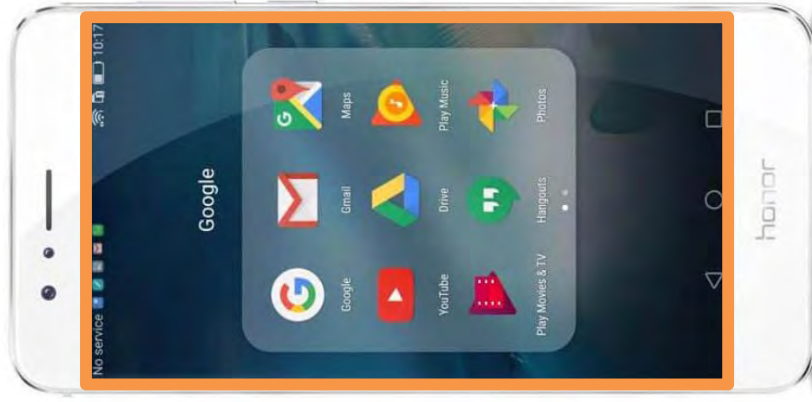
See <https://www.hihonor.com/global/products/smartphone/honor8/>, last accessed December 5, 2018.

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[i] a display;

The Huawei Honor 8 includes a display, outlined in the figure below.



See <https://www.hihonor.com/global/products/smartphone/honor8/>, last accessed December 5, 2018.

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[ii] a proximity sensor

The Huawei Honor 8 includes a proximity sensor.

See, e.g., the following discussion on removing the proximity sensor from an Honor 8:

Repair guide : Proximity and Light Sensor Huawei Honor 8



(<https://medias.sosav.fr/images/guides/guides/big/8dgt90ocf16nc0w.jpg?version=1.8>)

Step 28

Use the pair of tweezers and grab the proximity/light sensor and remove it.

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 <p>(https://medias.sosav.fr/images/guides/big/njd3bnzrf7v4nah.jpg?version=18)</p> <p>Step 29</p> <p>The proximity/light sensor of your Honor 8 is now disassembled.</p> <p>You can replace it with a new one if needed.</p> <p>See https://www.sosav.com/guides/mobiles/huawei/honor-8/proximity-light-sensor/, last accessed December 5, 2018.</p>	<p>[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate</p> <p>By way of example only, the Huawei Honor 8 is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their</p>
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<p>external object is proximate; and</p>	<p>hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:</p> <div style="border: 1px solid black; padding: 5px;"> <table border="0"> <tr> <td style="vertical-align: top;">TYPE_PROXIMITY</td> <td style="vertical-align: top;">Hardware</td> <td style="vertical-align: top;">Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</td> <td style="vertical-align: top;">Phone position during a call.</td> </tr> </table> </div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.</p> <div style="border: 1px solid black; padding: 5px;"> <pre> TYPE_PROXIMITY public static final int TYPE_PROXIMITY A constant describing a proximity sensor type. This is a wake up sensor. See SensorEvent.values for more details. See also: isWakeUpSensor() Constant Value: 8 (0x00000008) </pre> </div> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:</p>	TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.		

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<p>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor. Application Processor Power modes Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more. Non-wake-up sensors Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually.</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See <code>SensorManager.registerListener(SensorEventListener, Sensor, int, int)</code> for more details.</p>	<p>added in API level 21</p> <p>See <u>https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()</u>, last accessed November 29, 2018.</p> <p>In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (for example, when a user making or receiving a phone call).”</p>
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	<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>
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	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

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	<pre>override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) }</pre>
<p>[iv] a microprocessor adapted to:</p>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>The Huawei Honor 8 includes at least one microprocessor.</p> <div style="background-color: #1a202c; color: white; padding: 10px;"><p style="text-align: center;">CPU</p><ul style="list-style-type: none">• Honor 8 is powered by a 2.3 GHz octa-core CPU built on a 16nm architecture. 4GB of LPDDR4 RAM enables flawless multitasking and seamless gaming.• The CPU chipset contains an i5 co-processor, which controls Honor 8's sensors and other features. The i5 co-processor works aligned with the Kirin 950 SoC chipset to increase processing speeds, response times, and battery life.<ul style="list-style-type: none">• Honor 8 has a rapid smart file processing system for a smooth user experience.</div>

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	<p>See https://www.hihonor.com/global/products/smartphone/honor8/, last accessed December 5, 2018.</p>
<p>(a) determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Honor 8 is adapted to determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p>By way of example only, the Huawei Honor 8 is an Android phone. The Huawei Honor 8's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;</p> <p>Outgoing Call:</p> <pre> /** * Broadcast receiver to detect the outgoing calls. */ public class OutgoingReceiver extends BroadcastReceiver { public OutgoingReceiver() { } @Override public void onReceive(Context context, Intent intent) { String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER); Toast.makeText(ctx, "Outgoing: "+number, Toast.LENGTH_LONG).show(); } } </pre> <p>In the above, the system sends a broadcast action <code>android.intent.action.NEW_OUTGOING_CALL</code>.</p> <p>Incoming Call:</p>

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	<pre> /** * Listener to detect incoming calls. */ private class CallStateListener extends PhoneStateListener { @Override public void onCallStateChanged(int state, String incomingNumber) { switch (state) { case TelephonyManager.CALL_STATE_RINGING: // called when someone is ringing to this phone Toast.makeText(ctx, "Incoming: "+incomingNumber, Toast.LENGTH_LONG).show(); break; } } } </pre> <p>In the above, state is the call state, where it may be CALL_STATE_RINGING, CALL_STATE_OFFHOOK, or CALL_STATE_IDLE. Ringing is the state when someone is calling, offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Honor 8 is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.</p> <p>The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:</p>

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<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p>
<p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p>	<p>added in API level 21</p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p>

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	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See SensorManager.registerListener(SensorEventListener, Sensor, int, int) for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Honor 8, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Honor 8 is adapted to receive the signal from the activated proximity sensor. By way of example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p>	<p>The referenced discussion concerning the <code>isWakeUpSensor</code> file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor</pre> <p><small>added in API level 21</small></p> <pre>public boolean isWakeUpSensor ()</pre> <p>Returns true if the sensor is a wake-up sensor.</p> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "suspend" mode, reducing the power consumption by 10 times or more.</p>

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Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost. The oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

`SensorManager.registerListener(SensorEventListener, Sensor, int, int)` for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

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(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

The microprocessor of the Huawei Honor 8 is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.

By way of example only, the following excerpted document shows that when the Huawei Honor 8 is proximate to an object, and a call has been initiated or answered, power to the display is reduced and the display is darkened.

Is possible to turn off proximity sensor on Honor 8?

October 22, 2017 by Anonymous (<https://webcazine.com/author/answersanonymous/>).

[Back to Previous Page \(https://webcazine.com/forums/\)](https://webcazine.com/forums/)

Tags: Honor8 (<https://webcazine.com/forums/?cmatag=honor-8>) Huawei (<https://webcazine.com/forums/?cmatag=huawei>).

When I'm on a call, my phone will turn off automatically when the proximity sensor detects the phone is near my face/ear. Is it possible to turn off this feature? I need to do so for testing purpose.

See <https://webcazine.com/forums/is-possible-to-turn-off-proximity-sensor-on-honor-8/>, last accessed December 5, 2018.

By way of further example only, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call!
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See <https://developer.android.com/guide/topics/sensors/sensors/overview>, last accessed November 29, 2018.

In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>	<p>2. The mobile station of claim 1,</p> <p>See claim 1.</p>
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BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

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<p>further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.</p>	<p>The Huawei Honor 8 increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.</p> <p>In Huawei Honor 8, when the device is moved away from the object, the display brightens and/or lights up, indicating that, when an external object is no longer proximate to the device, the power to the display is increased.</p> <p>By way of example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call).”</p> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.</p>
<p>4. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the microprocessor reduces power to the display by turning off the display.</p>	<p>The microprocessor of the Huawei Honor 8 reduces power to the display by turning off the display.</p> <p>By way of example only, the following excerpted document shows the Huawei Honor 8 reducing power and turning off the screen.</p> <p>Is possible to turn off proximity sensor on Honor 8?</p> <p>October 22, 2017 by Anonymous (https://webcazine.com/author/answersanonymoususer/).</p> <p>* Back to Previous Page (https://webcazine.com/forums/)</p> <p>Tags: Honor8 (https://webcazine.com/forums/?cmatag=honor-8), Huawei (https://webcazine.com/forums/?cmatag=huawei).</p> <p>When I'm on a call, my phone will turn off automatically when the proximity sensor detects the phone is near my face/ear. Is it possible to turn off this feature? I need to do so for testing purpose.</p>

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See <https://webcazine.com/forums/is-possible-to-turn-off-proximity-sensor-on-honor-8/>, last accessed December 5, 2018.

By way of further example only, the Android Developer Code Website describes the proximity sensor's signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:

```

TYPE_PROXIMITY
public static final int TYPE_PROXIMITY
A constant describing a proximity sensor type. This is a wake up sensor.
See SensorEvent.values for more details.
See also:
isWakeUpSensor\(\)
Constant Value: 8 (0x00000008)
    
```

See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:

```

isWakeUpSensor
public boolean isWakeUpSensor ()
Returns true if the sensor is a wake-up sensor.
Application Processor Power modes
Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.
    
```

added in API level 21

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Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost. The oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See

`SensorManager.registerListener(SensorEventListener, Sensor, int, int)` for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

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	<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre>KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)</pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>
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	KOTLIN JAVA
	<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Honor 8 is a range-detecting sensor.</p> <p>The proximity sensor detects the range of a proximate object. By way of example only, when an incoming call is answered, the mobile station's display is on or off depending on the range of a proximate object.</p>

Is possible to turn off proximity sensor on Honor 8?

October 22, 2017 by Anonymous (<https://webcazine.com/author/answersanonymousez/>).

« Back to Previous Page (<https://webcazine.com/forums/>)

Tags: Honor8 (<https://webcazine.com/forums/?cmatag=honor-8>), Huawei (<https://webcazine.com/forums/?cmatag=huawei>).

When I'm on a call, my phone will turn off automatically when the proximity sensor detects the phone is near my face/ear. Is it possible to turn off this feature? I need to do so for testing purpose.

See <https://webcazine.com/forums/is-possible-to-turn-off-proximity-sensor-on-honor-8/>, last accessed December 5, 2018.

By way of further example only, the Android Developer Code Website describes range detection in proximity sensors:

TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
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See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.

And also, the code shows distance measurement:

```

override fun onSensorChanged(event : SensorEvent) {
    val distance = event.values[0]
    // Do something with this sensor data.
}
    
```

See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.

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	<p>The Android Developer Code Website further explains:</p> <p>★ Note: Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the <code>getMaximumRange()</code> method.</p> <p><i>See id.</i></p>
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BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

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<p>7. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p> <p>The proximity sensor of the Huawei Honor 8 begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p> <p>By way of example only, the following excerpted document suggests the Huawei Honor 8 reduces power and darkens the display due to object proximity substantially concurrently with an initiated wireless telephone call.</p> <p>Is possible to turn off proximity sensor on Honor 8?</p> <p>October 22, 2017 by Anonymous. (https://webcazine.com/author/answersanonymous/)</p> <p>« Back to Previous Page (https://webcazine.com/forums/)</p> <p>Tags: Honor8, (https://webcazine.com/forums/?cmatag=honor-8), Huawei, (https://webcazine.com/forums/?cmatag=huawei).</p> <p>When I'm on a call, my phone will turn off automatically when the proximity sensor detects the phone is near my face/ear. Is it possible to turn off this feature? I need to do so for testing purpose.</p> <p>See https://webcazine.com/forums/is-possible-to-turn-off-proximity-sensor-on-honor-8/, last accessed December 5, 2018.</p> <p>By way of further example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating or receiving a call, including by providing exemplary code at least substantially similar to Huawei code:</p>
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Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1 (preamble); 1[ii]-[iii]; 1(b)-(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call</p>	<p>The Huawei Honor 8 detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being</p>

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<p>condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call;</p>	<p>that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p> <p><i>See claim 1(a).</i></p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Honor 8 activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists.</p> <p><i>See claim 1(b).</i></p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Honor 8 reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p> <p><i>See claim 1(c)-(d).</i></p>
<p>14. A mobile station, comprising:</p>	<p><i>See claim 1(preamble).</i></p>
<p>a display;</p>	<p><i>See claim 1[i].</i></p>
<p>a proximity sensor</p>	<p><i>See claim 1[ii].</i></p>
<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p><i>See claim 1[iii].</i></p>

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<p>and a microprocessor adapted to:</p> <p>(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p><i>See claim[iv].</i></p> <p>The microprocessor of the Huawei Honor 8 is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p><i>See claim 1(a).</i></p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p><i>See claim 1(b).</i></p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p><i>See claim 1(c).</i></p>
<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p><i>See claim 1(d).</i></p>

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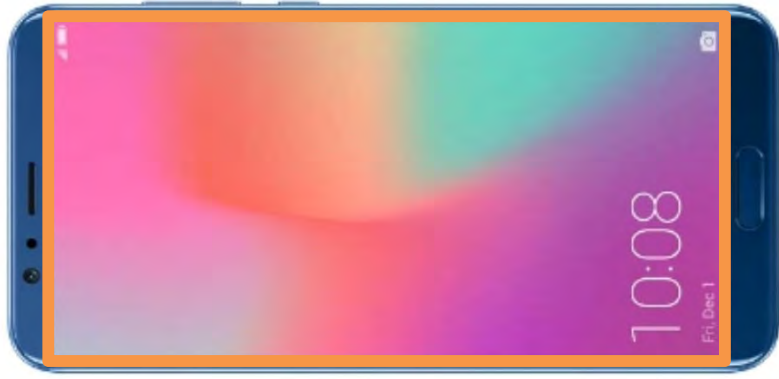
Asserted Claim Elements	Huawei Honor View10
<p>1. A mobile station, comprising:</p>	<p>To the extent that the preamble is found to be limiting, the Huawei Honor View10 is a mobile station.</p> <div></div> <p>See https://www.hihonor.com/us/product/10001859603314.html#1000000100132, last accessed December 5, 2018.</p>

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[i] a display;

The Huawei Honor View10 includes a display, outlined in the figure below.



See <https://www.hihonor.com/us/product/10001859603314.html#1000000100132>, last accessed December 5, 2018.

	<p>[ii] a proximity sensor</p> <p>The Huawei Honor View10 includes a proximity sensor.</p> <div> <p>DISPLAY COMPARE</p> <table border="1"> <tr> <td>Display size:</td> <td> 6.0 inches</td> </tr> <tr> <td>Resolution:</td> <td> 1080 x 2160 pixels</td> </tr> <tr> <td>Pixel density:</td> <td> 403 ppi</td> </tr> <tr> <td>Technology:</td> <td>IPS LCD</td> </tr> <tr> <td>Screen-to-body ratio:</td> <td>78.72 %</td> </tr> <tr> <td>Features:</td> <td>Ambient light sensor, Proximity sensor</td> </tr> </table> </div> <p>See https://www.phonearena.com/phones/Honor-View-10_id10752, last accessed December 6, 2018.</p> <p>See also OEM replacement part for proximity sensor compatible <u>only</u> with Huawei View 10:</p> <p>OEM Proximity Sensor Flex for Huawei Honor View 10</p> <ul style="list-style-type: none"> -Huawei Honor View 10 also known as Huawei Honor V10 in China. -Brand new and original Proximity Sensor Flex Replacement. -Compatible with Huawei Honor View 10 only. -This is the Light Sensor Flex replacement for Huawei Honor V10. 	Display size:	6.0 inches	Resolution:	1080 x 2160 pixels	Pixel density:	403 ppi	Technology:	IPS LCD	Screen-to-body ratio:	78.72 %	Features:	Ambient light sensor, Proximity sensor
Display size:	6.0 inches												
Resolution:	1080 x 2160 pixels												
Pixel density:	403 ppi												
Technology:	IPS LCD												
Screen-to-body ratio:	78.72 %												
Features:	Ambient light sensor, Proximity sensor												

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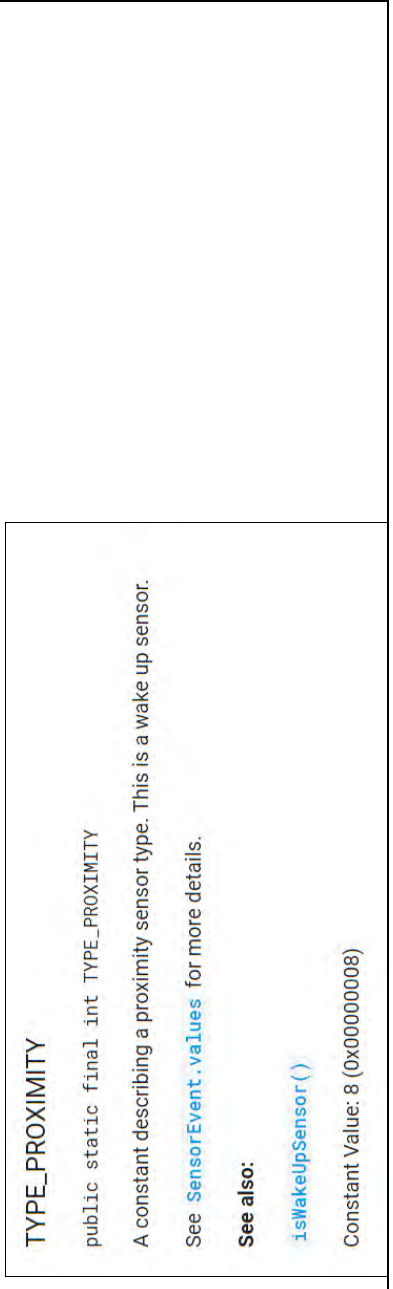
	<p>See https://www.witrigs.com/oem-proximity-sensor-flex-for-huawei-honor-view-10, last accessed December 6, 2018.</p>				
<p>[iii] adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate; and</p>	<p>The proximity sensor of the Huawei Honor View10 is adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate .</p> <p>By way of example only, the Huawei Honor View10 is an Android phone. The Android Developer Code Website describes functioning of proximity sensors in Android phones customized and adapted by Huawei to run on their hardware. In particular, the description specifies that the proximity sensor measures the proximity of an object relative to the device:</p>				
	 <p>The screenshot shows a table with the following content:</p> <table border="1"> <tr> <td>TYPE_PROXIMITY</td> <td>Hardware</td> <td>Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</td> <td>Phone position during a call.</td> </tr> </table>	TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.
TYPE_PROXIMITY	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.		
	<p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p>				
	<p>By way of further example, the Android Developer Code Website provides files that describe the generation of a signal by the sensor.</p>				
	 <p>The screenshot shows the following code and text:</p> <pre>TYPE_PROXIMITY public static final int TYPE_PROXIMITY A constant describing a proximity sensor type. This is a wake up sensor. See SensorEvent.values for more details. See also: isWakeUpSensor() Constant Value: 8 (0x00000008)</pre>				

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See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.

The referenced discussion concerning the isWakeUpSensor file explains the proximity sensor (for example, whether a wake-up sensor or non-wake-up sensor) generates signals:

```

isWakeUpSensor
public boolean isWakeUpSensor ()
Returns true if the sensor is a wake-up sensor.

```

added in API level 21

Application Processor Power modes

Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.

Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See `SensorManager.registerListener(SensorEventListener, Sensor, int, int)` for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

In addition, the Android Developer Code provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a

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person's head is from the face of a handset device (for example, when a user making or receiving a phone call).”

Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>[iv] a microprocessor adapted to:</p>	<p>The Huawei Honor View10 includes at least one microprocessor.</p> <p>SPECIFICATIONS</p> <hr/> <p>CHIPSET</p> <p>4*Cortex A73 2.36GHz + 4*Cortex A53 1.8GHz</p>

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	<p>See https://www.hihonor.com/us/product/10001859603314.html#1000000100132, last accessed December 5, 2018.</p>
<p>(a) determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p>The microprocessor of the Huawei Honor View 10 is adapted to determine, without using the proximity sensor, the existence of a second condition independent and different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p>By way of example only, the Huawei Honor View 10 is an Android phone. The Huawei Honor View 10's microprocessor uses code substantially similar to the code described and excerpted below to (1) determine when the user initiates an outgoing call or (2) determine when the user answers an incoming call;</p> <p>Outgoing Call:</p> <pre> /** * Broadcast receiver to detect the outgoing calls. */ public class OutgoingReceiver extends BroadcastReceiver { public OutgoingReceiver() { } @Override public void onReceive(Context context, Intent intent) { String number = intent.getStringExtra(Intent.EXTRA_PHONE_NUMBER); Toast.makeText(ctx, "Outgoing: "+number, Toast.LENGTH_LONG).show(); } } </pre> <p>In the above, the system sends a broadcast action <code>android.intent.action.NEW_OUTGOING_CALL</code>.</p>

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	<p>Incoming Call:</p> <pre> /** * Listener to detect incoming calls. */ private class CallStateListener extends PhoneStateListener { @Override public void onCallStateChanged(int state, String incomingNumber) { switch (state) { case TelephonyManager.CALL_STATE_RINGING: // called when someone is ringing to this phone Toast.makeText(ctx, "Incoming: "+incomingNumber, Toast.LENGTH_LONG).show(); break; } } } } </pre> <p>In the above, state is the call state, where it may be CALL_STATE_RINGING, CALL_STATE_OFFHOOK, or CALL_STATE_IDLE. Ringing is the state when someone is calling, offhook is when there is active or on hold call, and idle is when nobody is calling and there is no active call.</p> <p>See https://www.codeproject.com/Articles/548416/Detecting-Incoming-and-Outgoing-Phone-Calls-on-And, last accessed December 5, 2018.</p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p>The microprocessor of the Huawei Honor View10 is adapted to, in response to a determination in step (a) that the second condition exists, activate the proximity sensor.</p> <p>By way of example only and as shown above in claim 1(iv)(a), the microprocessor is able to determine whether a call is active according to the second condition.</p> <p>The microprocessor activates the proximity sensor. By way of example only, the Android Developer Code Website describes examples of proximity sensor activation and use:</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p> <p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the <code>isWakeUpSensor</code> file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>
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	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none"> • Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case. • Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See <code>SensorManager.registerListener(SensorEventListener, Sensor, int, int)</code> for more details.</p> <p>See https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor(), last accessed November 29, 2018.</p> <p>In the Huawei Honor View10, when the call button or answer button is pressed, the display darkens, indicating that the proximity sensor is activated.</p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p>The microprocessor of the Huawei Honor View10 is adapted to receive the signal from the activated proximity sensor.</p> <p>By way of example only, the Android Developer Code provides files that describe the proximity sensor's signaling to the microprocessor:</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>		

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	<p>Non-wake-up sensors</p> <p>Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost; the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent <code>maxFifoEventCount() == 0</code>, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:</p> <ul style="list-style-type: none">• Either unregister from the sensors when they do not need them, usually in the activity's <code>onPause</code> method. This is the most common case.• Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost. <p>Wake-up sensors</p> <p>In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See <code>SensorManager.registerListener(SensorEventListener, Sensor, int, int)</code> for more details.</p> <p>See <u>https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()</u>, last accessed November 29, 2018.</p> <p>In the Huawei Honor View 10, when the call button or answer button is pressed, the display darkens, indicating that the microprocessor received the signal from the activated proximity sensor that an object was proximate.</p>
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<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p>The microprocessor of the Huawei Honor View10 is adapted to reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists .</p> <p>By way of example only, the Android Developer Code Website describes the operation of a proximity sensor in order to reduce power to the display if a call is active and an object is proximate:</p> <div><p>TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.</p><p>Phone position during a call!</p></div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>In addition, the Android Developer Code Website provides the following exemplary code at least substantially similar to Huawei code for using the proximity sensor “to determine how far away a person’s head is from the face of a handset device (or example, when a user making or receiving a phone call).”</p>
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Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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<pre>override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) }</pre>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>2. The mobile station of claim 1,</p>	<p>See claim 1.</p>

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<p>further comprising increasing power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.</p>	<p>The Huawei Honor View10 increases power to the display if the signal from the activated proximity sensor indicates that the first condition no longer exists.</p> <p>In Huawei Honor View10, when the device is moved away from the object, the display brightens and/or lights up, indicating that, when an external object is no longer proximate to the device, the power to the display is increased.</p> <p>By way of example, the Android Developer Code Website describes that “[t]he proximity sensor is usually used to determine how far away a person’s head is from the face of a handset device (for example, when a user is making or receiving a phone call).”</p> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 30, 2018.</p>
<p>4. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the microprocessor reduces power to the display by turning off the display.</p>	<p>The microprocessor of the Huawei Honor View10 reduces power to the display by turning off the display.</p> <p>By way of example only, the Android Developer Code Website describes the proximity sensor’s signaling to the microprocessor, which would turn off power to the display if a call is active and an object is proximate:</p>

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	<p>TYPE_PROXIMITY</p> <pre>public static final int TYPE_PROXIMITY</pre> <p>A constant describing a proximity sensor type. This is a wake up sensor.</p> <p>See SensorEvent.values for more details.</p> <p>See also:</p> <p>isWakeUpSensor()</p> <p>Constant Value: 8 (0x00000008)</p>	
<p>See https://developer.android.com/reference/android/hardware/Sensor#TYPE_PROXIMITY, last accessed November 29, 2018.</p> <p>The referenced discussion concerning the isWakeUpSensor file explains the signal delivery from the proximity sensor (for example, whether from a wake-up sensor or non-wake-up sensor) to the application processor (AP), i.e., the processor on which an application is run:</p> <pre>isWakeUpSensor public boolean isWakeUpSensor () Returns true if the sensor is a wake-up sensor.</pre> <p>Application Processor Power modes</p> <p>Application Processor(AP), is the processor on which applications run. When no wake lock is held and the user is not interacting with the device, this processor can enter a "Suspend" mode, reducing the power consumption by 10 times or more.</p> <p style="text-align: right;"><small>added in API level 21</small></p>		

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Non-wake-up sensors

Non-wake-up sensors are sensors that do not wake the AP out of suspend to report data. While the AP is in suspend mode, the sensors continue to function and generate events, which are put in a hardware FIFO. The events in the FIFO are delivered to the application when the AP wakes up. If the FIFO was too small to store all events generated while the AP was in suspend mode, the older events are lost: the oldest data is dropped to accommodate the newer data. In the extreme case where the FIFO is non-existent `maxFifoEventCount() == 0`, all events generated while the AP was in suspend mode are lost. Applications using non-wake-up sensors should usually:

- Either unregister from the sensors when they do not need them, usually in the activity's `onPause` method. This is the most common case.
- Or realize that the sensors are consuming some power while the AP is in suspend mode and that even then, some events might be lost.

Wake-up sensors

In opposition to non-wake-up sensors, wake-up sensors ensure that their data is delivered independently of the state of the AP. While the AP is awake, the wake-up sensors behave like non-wake-up-sensors. When the AP is asleep, wake-up sensors wake up the AP to deliver events. That is, the AP will wake up and the sensor will deliver the events before the maximum reporting latency is elapsed or the hardware FIFO gets full. See `SensorManager.registerListener(SensorEventListener, Sensor, int, int)` for more details.

See [https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor\(\)](https://developer.android.com/reference/android/hardware/Sensor.html#isWakeUpSensor()), last accessed November 29, 2018.

See also:

Sensor	Type	Description	Common Uses
<code>TYPE_PROXIMITY</code>	Hardware	Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear.	Phone position during a call.

See <https://developer.android.com/guide/topics/sensors/sensors/overview>, last accessed November 29, 2018.

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Use the proximity sensor

The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:

```
KOTLIN      JAVA
private lateinit var mSensorManager: SensorManager
private var mSensor: Sensor? = null
...
mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager
mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY)
```

The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre>	<p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>5. The mobile station as recited in claim 1,</p>	<p>See claim 1.</p>
<p>wherein the proximity sensor is a mechanical proximity sensor, an optical sensor, or a range-detecting sensor.</p>	<p>The proximity sensor of the Huawei Honor View10 is a range-detecting sensor. By way of example only, the Android Developer Code Website describes range detection in proximity sensors:</p>

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	<div style="border: 1px solid gray; padding: 5px;"> <p>TYPE_PROXIMITY Hardware Measures the proximity of an object in cm relative to the view screen of a device. This sensor is typically used to determine whether a handset is being held up to a person's ear. Phone position during a call.</p> </div> <p>See https://developer.android.com/guide/topics/sensors/sensors_overview, last accessed November 29, 2018.</p> <p>And also, the code shows distance measurement:</p> <div style="border: 1px solid gray; padding: 5px;"> <pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } </pre> </div> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p> <p>The Android Developer Code Website further explains:</p> <div style="background-color: #e0f2f7; padding: 5px;"> <p>★ Note: Some proximity sensors return binary values that represent "near" or "far." In this case, the sensor usually reports its maximum range value in the far state and a lesser value in the near state. Typically, the far value is a value > 5 cm, but this can vary from sensor to sensor. You can determine a sensor's maximum range by using the <code>getMaximumRange()</code> method.</p> </div> <p>See <i>id.</i></p>
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<p>7. The mobile station as recited in claim 1, wherein the proximity sensor begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call.</p>	<p>See claim 1.</p>
<p>The proximity sensor of the Huawei Honor View10 begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call .</p> <p>By way of example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating or receiving a call, including by providing exemplary code at least substantially similar to Huawei code:</p>	<p>The proximity sensor of the Huawei Honor View10 begins detecting whether an external object is proximate substantially concurrently with the mobile station initiating an outgoing telephone call .</p> <p>By way of example only, the Android Developer Code Website shows how the proximity sensor is used to detect proximity substantially concurrently with initiating or receiving a call, including by providing exemplary code at least substantially similar to Huawei code:</p>
<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre> KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) </pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>	<p>Use the proximity sensor</p> <p>The proximity sensor lets you determine how far away an object is from a device. The following code shows you how to get an instance of the default proximity sensor:</p> <pre> KOTLIN JAVA private lateinit var mSensorManager: SensorManager private var mSensor: Sensor? = null ... mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mSensor = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) </pre> <p>The proximity sensor is usually used to determine how far away a person's head is from the face of a handset device (for example, when a user is making or receiving a phone call). Most proximity sensors return the absolute distance, in cm, but some return only near and far values. The following code shows you how to use the proximity sensor:</p>

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KOTLIN	JAVA
<pre>class SensorActivity : Activity(), SensorEventListener { private lateinit var mSensorManager: SensorManager private var mProximity: Sensor? = null public override fun onCreate(savedInstanceState: Bundle?) { super.onCreate(savedInstanceState) setContentView(R.layout.main) // Get an instance of the sensor service, and use that to get an instance of // a particular sensor. mSensorManager = getSystemService(Context.SENSOR_SERVICE) as SensorManager mProximity = mSensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY) } override fun onAccuracyChanged(sensor: Sensor, accuracy: Int) { // Do something here if sensor accuracy changes. } }</pre>	

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	<pre> override fun onSensorChanged(event: SensorEvent) { val distance = event.values[0] // Do something with this sensor data. } override fun onResume() { // Register a listener for the sensor. super.onResume() mProximity?.also { proximity -> mSensorManager.registerListener(this, proximity, SensorManager.SENSOR_DELAY_NORMAL) } } override fun onPause() { // Be sure to unregister the sensor when the activity pauses. super.onPause() mSensorManager.unregisterListener(this) } </pre> <p>See https://developer.android.com/guide/topics/sensors/sensors_position#sensors-pos-prox, last accessed November 29, 2018.</p>
<p>8. A method of conserving battery power in a mobile station, the mobile station adapted to detect the existence of a proximity condition, the proximity condition being that an external object is proximate, the method comprising:</p>	<p>To the extent that the preamble is found to be limiting, see claim 1 (preamble); 1[ii]–[iii]; 1(b)–(d).</p>
<p>the mobile station detecting the existence of an initiated call condition or an answered-call</p>	<p>The Huawei Honor View10 detects the existence of an initiated call condition or an answered-call condition independent and different from the proximity condition, the initiated-call condition being</p>

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<p>condition independent and different from the proximity condition, the initiated-call condition being that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call;</p>	<p>that a user of the mobile station has performed an action to initiate a call, and the answered-call condition being that a user of the mobile station has performed an action to answer a call.</p> <p><i>See claim 1(a).</i></p>
<p>the mobile station activating the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists; and</p>	<p>The Huawei Honor View10 activates the proximity sensor in response to a determination that an answered-call condition or initiated-call condition exists.</p> <p><i>See claim 1(b).</i></p>
<p>the mobile station reducing power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p>	<p>The Huawei Honor View10 reduces power consumption of a display of the mobile station if the activated proximity sensor indicates that the proximity condition exists.</p> <p><i>See claim 1(c)-(d).</i></p>
<p>14. A mobile station, comprising:</p>	<p><i>See claim 1(preamble).</i></p>
<p>a display;</p>	<p><i>See claim 1[i].</i></p>
<p>a proximity sensor</p>	<p><i>See claim 1[ii].</i></p>
<p>adapted to generate a signal indicative of the existence of a first condition, the first condition being that an external object is proximate;</p>	<p><i>See claim 1[iii].</i></p>

BNR'S PRELIMINARY INFRINGEMENT CONTENTIONS

Exhibit B-14 – Infringement of U.S. Patent No. 8,204,554

<p>and a microprocessor adapted to:</p> <p>(a) determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call;</p>	<p><i>See claim [iv].</i></p> <p>The microprocessor of the Huawei Honor View10 is adapted to determine, independently of the determination whether the external object is proximate, the existence of a second condition different from the first condition, the second condition being that a user of the mobile station has performed an action to initiate an outgoing call or to answer an incoming call.</p> <p><i>See claim 1(a).</i></p>
<p>(b) in response to a determination in step (a) that the second condition exists, activate the proximity sensor,</p>	<p><i>See claim 1(b).</i></p>
<p>(c) receive the signal from the activated proximity sensor, and</p>	<p><i>See claim 1(c).</i></p>
<p>(d) reduce power to the display if the signal from the activated proximity sensor indicates that the first condition exists.</p>	<p><i>See claim 1(d).</i></p>