

Claims 11-14 Properly Narrow Claim 5

	<i>Endo Pharm.</i>	The '641 Patent
Independent Claim	An oxymorphone controlled release formulation with “about 5 mg to about 80 mg oxymorphone”	A secondary lithium-ion battery with certain CCV and capacity ratio within the claimed ranges
Dependent Claim	The oxymorphone controlled release formulation that also produces certain pharmacokinetic properties	The secondary lithium-ion battery that also maintains certain percentage of capacity after 400 cycles.
Holding	“Endo does not claim any controlled release configuration of oxymorphone dosage, rather only those which have been specifically calibrated to produce the pharmacokinetic properties recited in the claims—excluding those that do not exhibit such properties”	Claims 11-14 do not cover any secondary lithium-ion battery also practicing claim 5, rather only those that are specifically configured to retain the claimed capacity levels after 400 cycles, as required by claims 11-14.

POR at 37-38; Sur-Reply at 21-22

Endo Pharm. Inc. v. Teva Pharm. USA, Inc., 731 Fed. App'x 962, 971 (Fed. Cir. 2018)

A POSITA Would Know That Practicing Claim 5 Does Not Require Practicing Claims 11-14



13 Q. So it is your view then, Dr. Yao, that a
14 prior art that satisfies all of the limitations of
15 Claim 5 still may not meet the limitations of
16 Claims 11 through 14; is that right?

17 A. That's correct. Yeah, batteries
18 satisfies the Claim 5, which does not necessarily
19 meet -- satisfy the limitation for Claim 11 to 14.

APPLE-1034 [Yao Dep.] at 79:13-19; POR at 38-39; Sur-Reply at 21-22

A POSITA Would Know That Practicing Claim 5 Does Not Require Practicing Claims 11-14

20 Q. Let's say that it had all of those aspects.
21 Would every single battery that has all of those other
22 aspects and a charge cutoff voltage above 4.2 volts but
23 below 5.8 volts necessarily meet Claims 11 through 14 so
24 long as its capacity ratio fell within the claimed
25 range?

1 A. No, I don't think so. Not necessarily. Page 121
2 are many things that could be done wrong. You could say
3 it has these key features, but it could have others. It
4 could be contaminated. You know, the electrolyte could
5 have contaminants that don't -- so no, it -- it's --
6 it's not possible to say that it would necessarily meet
7 those.

8 I think the patent describes a system where
9 they apparently have some data that includes 400 cycles.
10 So for that system, they achieved that cycle life, but
11 you can't say more than that. You can't say these two
12 features would guarantee that you would reach that cycle
13 life in all cases, no.

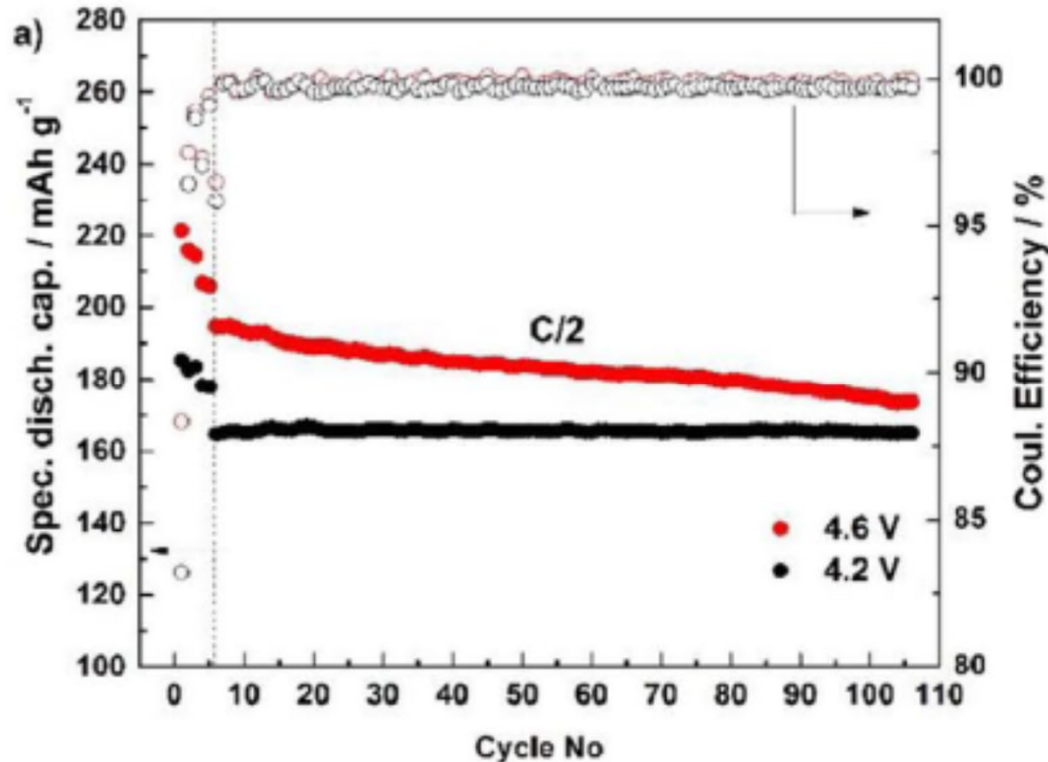
No Evidence that the Yamaki-Sakamoto Combination Battery Meets Claims 11-14



153. It was well-known in the art at the priority date and still today that capacity fading is not a linear process. In many cases, during the initial cycles, the capacity may be decreasing at a relatively stable rate, but at some “knee” point, the rate of capacity loss may accelerate, causing a rapid decline. This phenomenon was known as “sudden death,” “rollover failure,” or “knee” in the literature.¹³² Due to the existence of this phenomenon, a POSITA would understand that it is not possible to rely on the capacity fading behavior of a lithium-ion battery during the initial cycles to estimate its long-term performance over hundreds of cycles. As discussed below, many batteries were able to retain similar or even the same level of capacity in the initial phase, but they experienced vastly different capacity losses in later stages.¹³³ To have a reliable assessment of a battery’s cycle life over hundreds of cycles, experimentation must be done.

Ex. 2007 [Yao Decl.], ¶153; POR at 40-42

No Evidence that the Yamaki-Sakamoto Combination Battery Meets Claims 11-14



- During the first few cycles “at a low C-rate,” “a significant difference is not observed for cells cycled to the two different cutoff voltages”
- “very different capacity retention afterwards”
- The capacity fade is primarily due to issues associated with the cathode

Ex. 2007 [Yao Decl.], ¶¶158-160; POR at 41; Ex. 2023 [Laszcynski 2019]

No Evidence that the Yamaki-Sakamoto Combination Battery Meets Claims 11-14



162. Further, the battery that Sakamoto reports as having the best cycle life only retained approximately 75% of its capacity after 300 cycles (according to Sakamoto).¹⁵² The cycle life data were tested with the conventional limit of charge cutoff voltage of 4.2V. A POSITA would not have reasonably expected that raising the charge cutoff voltage above the 4.2V limit would result in improved capacity retention, such that the resulting Yamaki-Sakamoto battery could meet the limitations of claims 11-14. Instead, a POSITA would have expected worse cycle life and capacity retention as a result of raising the charge cutoff voltage. Mr. Hruska agrees with me on this point, as I understand he testified that “while batteries charged to higher cutoff voltages will have higher discharge capacity, they will generally also show more rapid loss in capacity upon extended cycling.”¹⁵³

Ex. 2007 [Yao Decl.], ¶162; POR at 41-42

No Evidence that the Yamaki-Sakamoto Combination Battery Meets Claims 11-14

13 I'm asking you whether you could reliably
14 predict the capacity retention of a battery after, say,
15 200 or 300 cycles without testing.

16 A. Well, you can't reliably predict the capacity
17 of a system from one data point no matter what that
18 point is. It's a much more complex surface of the
19 failure modes and capacity loss over time and cycles and
20 conditions.

21 So you're asking if you could reliably
22 predict. I would say that you can't rely bring predict
23 from a single test point no matter where the point is.

Ex. 2008 [Hruska Dep.] at 46:13-23; POR at 42-43

No Evidence that the Yamaki-Sakamoto Combination Battery Meets Claims 11-14

19 Q. But back to my question. Is testing important
20 in terms of determining the capacity retention of a
21 battery after a certain number of cycles?

22 A. Yes, testing is important.

23 Q. Why?

24 A. Because it's the only way to obtain specific
25 information. There's far too many things that you're

Ex. 2008 [Hruska Dep.] at 54:19-55:18; POR at 43

Yamaki Does Not Disclose the Normal Testing Conditions Required by Claims 11-14

	<i>Endo Pharm.</i>	The '641 Patent
Challenged Claim	Dissolution profile measured at 50 rpm	Measure capacity retention at normal operating conditions (1C or 0.5C)
Prior Art	Dissolution profile measured at 100 rpm	Measure capacity retention at slow charging rate (~0.1C)
Factual Findings	Federal Circuit: “a [POSITA] would not have expected a correlation between results obtained ... at different speeds”	Dr. Yao: “A POSITA would understand that ... [Yamaki’s slow charging] performance does not reflect how the battery will perform in practical, normal operating conditions”
Conclusion	Not disclosed	Not disclosed

Ex. 2007 [Yao Decl.], ¶¶167-173; POR at 43-46;

Endo Pharm. Inc. v. Teva Pharm. USA, Inc., 731 Fed. App’x 962, 970 (Fed. Cir. 2018)
IPR2023-01350

Yamaki Does Not Disclose the Normal Testing Conditions Required by Claims 11-14

Moreover, the specification states that “[e]xcept for voltage, all process parameters for charge and discharge are commonly used in the art,” leading a POSITA to understand that normal testing conditions for commercial batteries are to be utilized.

RJ Tech., LLC v. Apple Inc., SACV-22-01874-JVS, Dkt. 82 at 29-30 (APPLE-1031 at 30); POR at 44.



Yamaki Does Not Disclose the Normal Testing Conditions Required by Claims 11-14



173. As discussed above, Yamaki tested the cycle life of its batteries with a current of approximately 0.1C, which is significantly lower than the normal current used to test the cycle life of a lithium-ion battery. A POSITA would understand that Yamaki used such a low current to have an initial assessment of the battery's performance, but that performance does not reflect how the battery will perform in practical, normal operating conditions. A lot more experimentation would be needed to assess the cycle life of the Yamaki battery over hundreds of cycles. Indeed, Mr. Hruska appears to agree with me that the "10 cycle capacity measurement does not provide a complete picture of the capacity retention capability of the battery" and Yamaki was "at early stages of battery testing."¹⁷⁰

Ex. 2007 [Yao Decl.], ¶173; POR at 43-46

No Evidence that the Yamaki-Sakamoto Combination Battery Meets Claims 11-14



166. Accordingly, Mr. Hruska cites no relevant reference that could allow a POSITA to reasonably expect that Yamaki and Sakamoto could be successfully combined to meet the limitations of claims 11-14. Instead, a POSITA would have looked to references similar to the ones I have discussed above at paragraphs 154-159, which concern LiCoO_2 or its variations.

Ex. 2007 [Yao Decl.], ¶166; POR at 40-46

A POSITA Would Know That Yasunami Does Not Disclose the Claimed Capacity Retention

(0066) The resultant batteries were then subjected to a charge/discharge cycle test at a charging end voltage of 3.9 to 4.3 V and a discharging end voltage of 1.8 V with a current density of 2 mA/cm². The number of cycles required to attain 60% of the initial discharge capacity was deemed the charge/discharge cycle lifespan. For embodiment example 1 of the present invention, prior to charging, discharging was first performed to 0.5 to 1.5 V, after which charging was performed. In the comparative examples, discharging was either not performed prior to charging, or discharging was performed to a discharging end voltage either less than 0.5 V or greater than 1.5 V. The results are shown in TABLE 1.

Ex. 2030 [Yasunami], ¶166; POR at 63

A POSITA Would Know That Yasunami Does Not Disclose the Claimed Capacity Retention

TABLE 1

No.		Negative electrode active material	Charging end voltage	Discharging end voltage prior to charging	Energy density after discharge to 1.8 V	Cyclability (cycles)
1	Present invention	a	4.3 V	1.0 V	2450 mWH	220
2	"	a	4.2	1.0	2310	255
3	"	a	4.1	0.8	2250	200
5	"	a	4.0	0.6	2120	280
4	"	a	"	1.0	"	290
5	"	a	"	1.3	"	285
6	"	a	"	1.5	"	195
7	"	a	3.9	0.9	1990	305
8	"	b	4.2	1.0	2290	260
9	"	b	4.0	1.0	2030	275
10	"	c	4.2	1.0	2210	190
11	"	c	4.0	1.0	1950	245
a	Comparative ex.	a	4.0 V	1.8 V	2120 mWH	120
b	"	b	"	1.8	2030	95
c	"	c	"	1.8	1950	115
d	"	a	"	1.6	2120	140
e	"	a	4.1	0.4	2250	120

Ex. 2030 [Yasunami], Table 1; POR at 63

No Evidence that the Yasunami-Koyama Combination Battery Meets Claims 11-14



212. Further, as I have discussed above, a POSITA would understand that adjusting the capacity ratio would not confer benefit, if any, to the cycle life of the battery, given Yasunami has already addressed the issue of lithium plating by using lithium transition metal oxides as the anode active material. Accordingly, even if a POSITA adjusts the capacity ratio according to Koyama, the POSITA would not have expected that the cycle life of the batteries in Yasunami would meaningfully improve so that they meet the limitations of claims 11-14.

Ex. 2007 [Yao Decl.], ¶212; POR at 63-64