UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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LUMENIS BE LTD.,
Petitioner,

v.

BTL HEALTHCARE TECHNOLOGIES A.S.,
Patent Owner.

_____

Case IPR2021-01404
Patent No. 10,124,187

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PETITION FOR *INTER PARTES* REVIEW

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1005	U.S. Patent Application Publication No. 2014/0148870 ("Burnett-'870")
1006	Chris Hovey et al., *The Guide To Magnetic Stimulation*, Magstim, July 21, 2006, Affidavit ("Magstim")[1]
1007	U.S. Patent Application Publication No. US20050216062 ("Herbst")
1008	U.S. Pat. No. 7,396,326 ("Ghiron")
1009	U.S. Pat. No. 10,675,819 ("Li")
1010	U.S. Pat. Pub. No. 2014/0277219A1 ("Nanda")
1011	Alain-Yvan Belanger, *Therapeutic Electrophysical Agents*, 3d Edition, Wolters Kluwer (2015), Declaration ("Belanger")
1012	*Reserved*
1013	U.S. Patent Application Publication No. 2010/0168501 from Application No. 12/508,529 ("Burnett-'529")

[1] All pinpoint citations to Magstim, throughout this document and the corresponding expert declaration, refer to the page number originally in Magstim itself (*i.e.*, in the bottom middle portion of Magstim).

Exhibit (Ex-)	Description
1014	Gorgey et al., *Effects of Electrical Stimulation Parameters on Fatigue in Skeletal Muscle*, J. Orthop. & Sports Phys. Therapy Vol. 39: 9 (2009) ("Gorgey")
1015	Stevens et al., *Neuromuscular Electrical Stimulation for Quadriceps Muscle Strengthening After Bilateral Total Knee Arthroplasty: A Case Series*, Journal of Orthopaedic & Sports Physical Therapy, 34(1):21-29 (2004) ("Stevens")
1016	Doucet et al., *Neuromuscular Electrical Stimulation for Skeletal Muscle Function*, Yale Journal of Biology & Medicine 85:201-215 (2012) ("Doucet")
1017	Abulhasan et al., *Peripheral Electrical and Magnetic Stimulation to Augment Resistance Training*, Journal of Functional Morphology and Kinesiology, 1(3):328-342 (2016) ("Abulhasan")
1018	Remed, Salus Talent Brochure (2010) ("Salus")
1019	Iskra Medical, TESLA Stym Website (2013) ("TESLA Stym")
1020	510(k) Summary, No. K163165, AM-100 (2017) ("AM-100")
1021	510(k) Summary, No. K160992, HPM-6000 (2016) ("HPM-6000")
1022	U.S. Pat. Pub. No. 2003/0158585 ("Burnett '585")
1023	U.S. Provisional Patent Application Ser. No. 60/848,720 ("Burnett-Provisional-'720")
1024	U.S. Pat. No. 6,701,185 ("Burnett-'185")
1025	U.S. Pat. Pub. No. 2008/0306325 ("Burnett-'325")
1026	U.S. Pat. No. 6,155,966 ("Parker")
1027	U.S. Pat. No. 5,344,384 ("Ostrow")
1028	Andrey Gennadievich Belyaev, *Effect of Magnetic Stimulation on the Strength Capacity of Skeletal Muscle* (2015) (Ph.D. dissertation,

Exhibit (Ex-)	Description
	Federal State Budgetary Educational Institution of Higher Professional Education "Velikiye Luki State Academy of Physical Culture and Sport") (English translation) ("Belyaev")
1029	Andrey Gennadievich Belyaev, *Effect of Magnetic Stimulation on the Strength Capacity of Skeletal Muscle* (2015) (Ph.D. dissertation, Federal State Budgetary Educational Institution of Higher Professional Education "Velikiye Luki State Academy of Physical Culture and Sport") (Russian)
1030	U.S. Pat. No. 7,024,239 ("George")
1031	U.S. Pat. No. 5,181,902 ("Erickson")
1032	U.S. Pat. Pub. No. 2006/0199992 ("Eisenberg")
1033	U.S. Pat. No. 5,718,662 ("Jalinous")
1034	U.S. Pat. No. 5,061,234 ("Chaney")
1035	U.S. Pat. No. 10,271,900 ("Marchitto-'900")
1036	U.S. Pat. Pub. No. 2016/0184601 ("Gleich")
1037	Judith Woehrle et al., *Dry Needling and its Use in Health Care – A Treatment Modality and Adjunct for Pain Management*, J. Pain & Relief, 4(5):1-3 (2015) ("Woehrle")
1038	U.S. Patent Publication No. 2015/0157873 ("Sokolowski")
1039	U.S. Patent No. 7,744,523 ("Epstein")
1040	U.S. Pat. No. 6,738,667 ("Deno")
1041	U.S. Pat. No. 6,871,099 ("Whitehurst")
1042	U.S. Patent Application Publication No. US20050075701 ("Shafer-'701")

Exhibit (Ex-)	Description
1043	U.S. Patent Application Publication No. US20050075702 ("Shafer-'702")
1044	D. Suarez-Bagnasco et al., *The Excitation Functional for Magnetic Stimulation of Fibers*, 32nd Ann. Int'l Conf. of the IEEE EMBS, 4829–33 (2010) ("Suarez-Bagnasco")
1045	Zhi-De Deng et al., *Electric field depth-focality tradeoff in transcranial magnetic stimulation: simulation comparison of 50 coil designs*, Brain Stimulation, 6(1):1-13 (2013) ("Zhi-De-Deng-Electric")
1046	Zhi-De Deng, *Electromagnetic Field Modeling of Transcranial Electric and Magnetic Stimulation: Targeting, Individualization, and Safety of Convulsive and Subconvulsive Applications*, (2013) (Ph.D. dissertation, Columbia University) ("Zhi-De-Deng-Electromagnetic")
1047	U.S. Patent Application Publication No. 2011/0190569 ("Simon-'569")
1048	U.S. Patent Application Publication No. 2011/0152967 ("Simon-'967")
1049	U.S. Patent Application Publication No. 2011/0125203 ("Simon-'203")
1050	U.S. Patent Application Publication No. 2011/0046432 ("Simon-'432")
1051	U.S. Patent No. 9,089,719 ("Simon-'719")
1052	U.S. Patent No. 9,037,247 ("Simon-'247")
1053	U.S. Patent No. 8,868,177 ("Simon-'177")
1054	File History of U.S. Patent Application No. 12/859,568 (excerpts) ("File-history-'568")

Exhibit (Ex-)	Description
1055	File History of U.S. Patent Application No. 12/964,050 (excerpts) ("File-history-'050")
1056	File History of U.S. Patent Application No. 13/005,005 (excerpts) ("File-history-'005")
1057	File History of U.S. Patent Application No. 13/024,727 (excerpts) ("File-history-'727")
1058	*Reserved*
1059	*Reserved*
1060	*Reserved*
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1062	*Reserved*
1063	U.S. Patent Application Publication No. 2011/0172735 ("Johari")
1064	U.S. Patent Application Publication No. 2013/0123765 ("Zarsky")
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1070	U.S. Patent Application Publication No. 2001/0031906 ("Ishikawa")
1071	U.S. Patent No. 5,766,124 ("Polson")
1072	*Reserved*

Exhibit (Ex-)	Description
1073	U.S. Patent Application Publication No. 2009/0284339 ("Choi")
1074	Javier Ruiz-Esparza & Julio Barba Gomez, *The Medical Face Lift: A Noninvasive, Nonsurgical Approach to Tissue Tightening in Facial Skin Using Nonablative Radiofrequency*, Dermatol Surg 29:325-332 (2003) ("Ruiz-Esparza")
1075	Nils Krueger et al., *Safety and Efficacy of a New Device Combining Radiofrequency and Low-Frequency Pulsed Electromagnetic Fields for the Treatment of Facial Rhytides*, J Drugs Dematol. 11(11):1306-1309 (2012) ("Krueger")
1076	U.S. Patent No. 10,195,454 ("Yamashiro")
1077	Venus Concept Ltd., Venus Freeze MP^2 User Manual International (2012) ("Venus Freeze")
1078	European Patent EP 2069014 B1 ("Hancock")
1079	U.S. Patent No. 8,204,446 ("Scheer")
1080	Agilent 33500 Series 30 MHz Function / Arbitrary Waveform Generator User's Guide ("Agilent")
1081	Jim Turley, *Agilent Technologies Announces 30 MHz Function/Arbitrary Waveform Generators with Unparalleled Signal Accuracy*, Elec. Eng'g J. (Aug. 4, 2010), https://www.eejournal.com/article/20100804-03/ ("Turley")
1082	*Agilent Announces 30 MHz Function/Arbitrary Waveform Generators*, Microwave J. (Aug. 3, 2010), https://www.microwavejournal.com/articles/9851-agilent-announces-30-mhz-function-arbitrary-waveform-generators ("Microwave")
1083	Declaration of Jonathan Bradford

I. INTRODUCTION

Lumenis Be Ltd. ("Petitioner") respectfully requests IPR of Claims 1, 19-30 ("Claims") of U.S. 10,124,187 ("'187") pursuant to §§311-319 and §42.100.

'187 is directed to treating a patient using a combination of a time-varying magnetic field and radiofrequency (RF) waves, to provide an "aesthetic" improvement to a patient's "skin" and other "tissue." '187, *Abstract*, 1:64–2:8. '187 describes a combined device for applying radiofrequency treatment and a time-varying magnetic field to a patient. Bikson, ¶¶40-42, 102-108.

Figure 6 shows the RF treatment device (116), including a high-frequency (HF) generator (111) receiving power from a power supply (110) and generating radiofrequency waves, for delivery to a radiofrequency electrode (6). '187, Fig. 6, 7:34–39, 7:58–62, 8:29–31, 8:62–64.

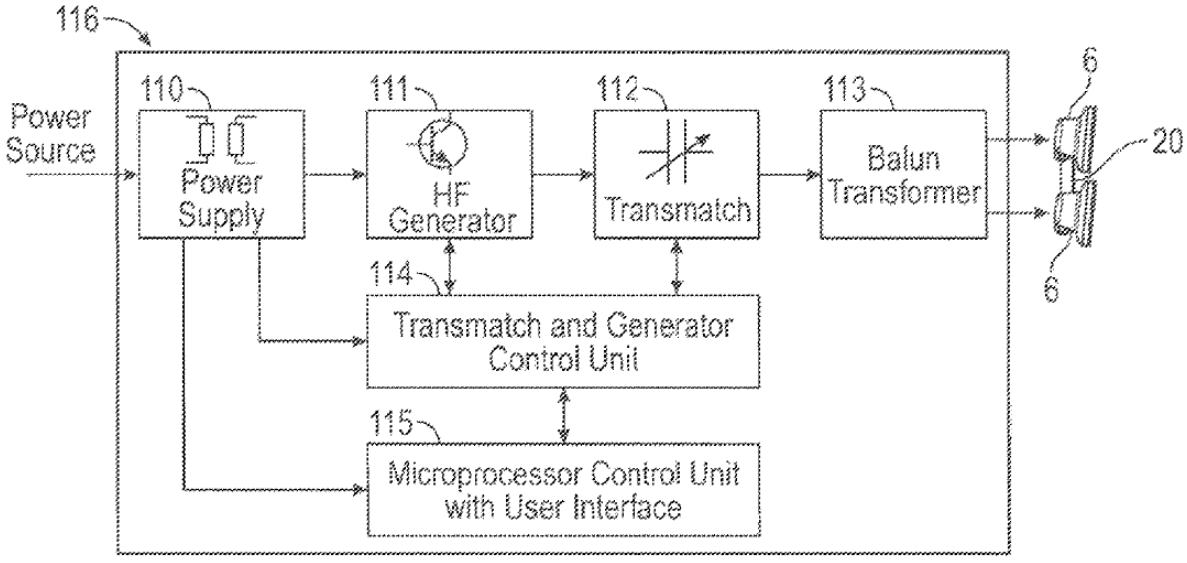

FIG. 6

The radiofrequency waves heat the target structure, to "remove[] and/or remodel[] adipose tissue," "collagen tissue," and "elastic fibers" in the treated area. '187, *Abstract*, 2:4–8, 13:2–5. Bikson, ¶¶102-103.

Figure 4A shows the magnetic field generating device, including an energy storage device (20) (*i.e.*, a capacitor) receiving energy from an energy source (23), and connected to a coil (21) through a switching device (22).

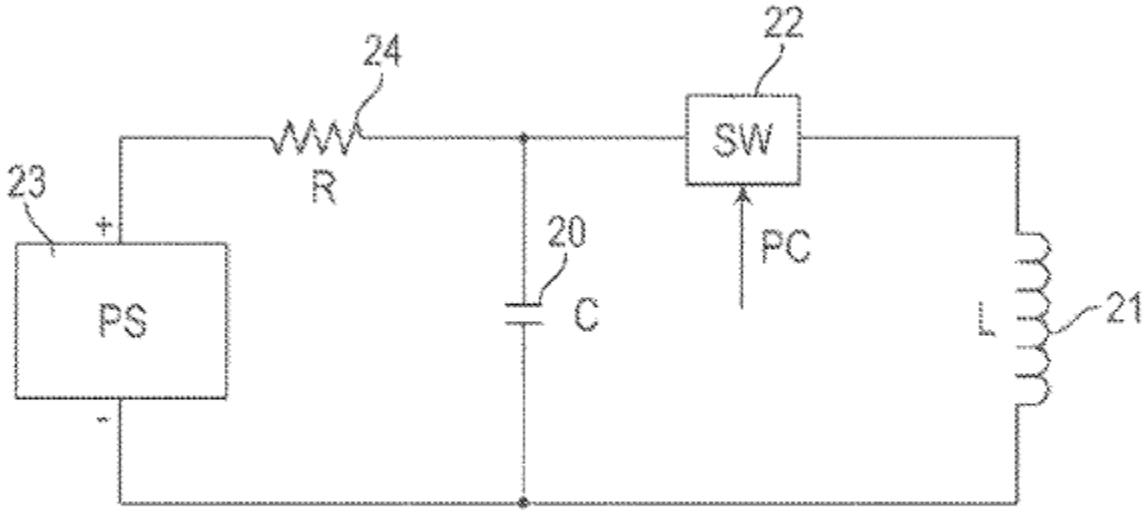

FIG. 4A

'187, Fig. 4A, '187, 6:11–18. Energy from the storage device flows through the coil, generating the magnetic field applied to the patient. '187, 6:15–18. Bikson, ¶¶104-108.

'187 explains that various types of "non-invasive aesthetic" treatment

methods were known and in use, including "radiofrequency treatment." '187, 1:39–43. However, '187's purposed novelty is a "method of treating a biological structure [that] uses a combination of non-invasive methods." '187, 1:66–67. Bikson, ¶102.

But the combination of magnetic stimulation and heat treatment using radiofrequency was well-known and the claimed features of magnetic or radiofrequency treatment or devices were merely conventional. Bikson, ¶¶43-101. **Edoute** discloses a device for applying RF and magnetic field simultaneously to target body region for complementary effect resulting from simultaneous heat (RF) and electromagnetic stimulation on muscles. Edoute, *Abstract*, [0200]. Bikson, ¶¶126-128, 219. **Park** discloses treating a patient with a combination of pulsed electromagnetic field and heat energy such as RF for "firming muscles." Park, [0004], [0036]. Bikson, ¶¶234-236. **Zarsky** discloses circuit components to generate RF for treating tissues. Zarsky, *Abstract*, Fig. 1. Bikson, ¶¶226-227.

II. MANDATORY NOTICES UNDER 37 C.F.R. §42.8

A. Real Party-in-Interest

Lumenis Be Ltd. is the real party-in-interest. No other party had access to or control over the present Petition, and no other party funded or participated in preparation of the present Petition.

B. Related Matters

Petitioner is concurrently filing another petition (IPR2021-01405) challenging claims 2-18 of the '187 patent. Due to word-count constraints and the large number of claims, requiring 13,343 words in IPR2021-01404 and 13,925 words in IPR2021-01405, claims 1, 19-30 are presented separately herein. *See* PTAB Consolidated Trial Practice Guide, November 2019, 59-61 (permitting parallel petitions in certain circumstances, such as a large number of claims).

The '187 patent is not the subject of any other litigation.

C. Lead and Back-Up Counsel

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Petitioner consents to electronic service of documents to the email addresses

of the counsel identified above.

III. PAYMENT OF FEES

The undersigned authorizes the Office to charge the fee required by §42.15(a) for this Petition for review to Deposit Account No. 18-1945, under Order No. 116610-0005-651. Any additional fees that might be due are also authorized.

IV. REQUIREMENTS FOR *INTER PARTES* REVIEW

A. Grounds for Standing

Pursuant to §42.104(a), Petitioner certifies '187 is available for IPR. Petitioner is not barred or estopped from requesting IPR challenging the Claims on the grounds herein.

B. Identification of Challenge

Pursuant to §§42.104(b), Petitioner requests the Board cancel the Claims as unpatentable.[2]

1. Specific Art on Which the Challenge is Based

Name	Exhibit	Filed	Published	Prior art
Simon	1004	3/3/2015	6/18/2015	§102(a)(1)-(2)
Edoute	1061	9/18/2014	1/22/2015	§102(a)(1)-(2)
Burnett-'870	1005	11/20/2013	5/29/2014	§102(a)(1)-(2)
Zarsky	1064	11/16/2011	5/16/2013	§102(a)(1)-(2)

[2] The art predates '187's earliest priority date; Petitioner takes no position as to the priority claims.

Name	Exhibit	Filed	Published	Prior art
Park	1069	11/10/2014	5/12/2016	§102(a)(2)
Ishikawa	1070	4/13/2001	10/18/2001	§102(a)(1)-(2)

2. Statutory Grounds on Which the Challenge is based

Ground	Statute	Claim(s)	Prior Art
1	§103	1, 19, 22-29	Simon in view of Edoute
2	§103	20-21	Simon in view of Edoute and Ishikawa
3	§103	30	Simon in view of Edoute and Zarsky
4	§103	1, 19, 22-29	Simon in view of Edoute and Park
5	§103	20-21	Simon in view of Edoute, Park, and Ishikawa
6	§103	30	Simon in view of Edoute, Park, and Zarsky
7	§103	1, 19-30	Burnett-'870 in view of Park and Zarsky

See §VIII.

V. BACKGROUND

A. '187 Patent

'187 is directed to patient treatment using a combination of a time-varying magnetic field and radiofrequency waves, to provide an "aesthetic" improvement to a patient's "skin" and other "tissue." '187, *Abstract*, 1:64–2:8. Bikson,

¶102. '187 recognizes that "radiofrequency treatment" was one of the "most common methods used for non-invasive aesthetic applications" and its effect is known to be "based specifically on heat production in the biological structure." '187, 1:39-47.

'187 discloses a treatment device for applying radiofrequency (RF) treatment to a patient. '187, Fig. 6.

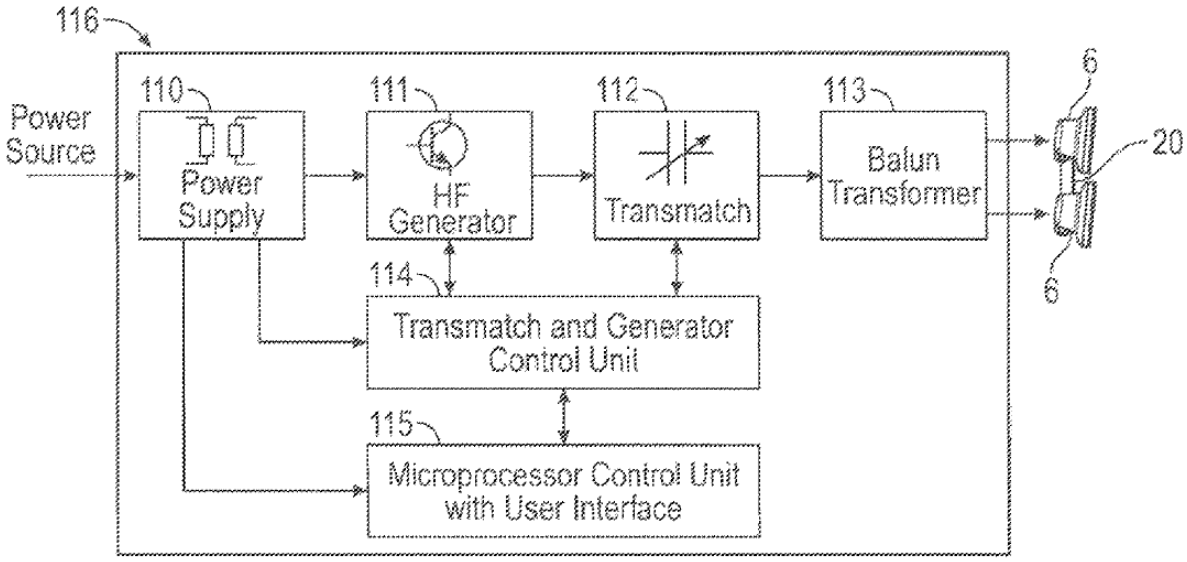


FIG. 6

Treatment device (116) receives power from a power supply (110), which provides power to a high-frequency (HF) generator (111) generating radiofrequency waves delivered to a radiofrequency electrode (6). '187, 7:34–39, 7:58–62, 8:29–31, 8:62–64. The radiofrequency waves heat a target structure of the patient, "remov[ing] and/or remodel[ing] adipose tissue," "collagen tissue," and "elastic fibers." '187, *Abstract*, 2:4–8, 13:2–5. Bikson, ¶103.

'187 also discloses magnetic field treatment of the patient's target body structure. Figure 4A shows a circuit including an energy storage device (20) (*i.e.*, a capacitor) electrically connected to an energy source (23), a switching device (22), and a coil (21).

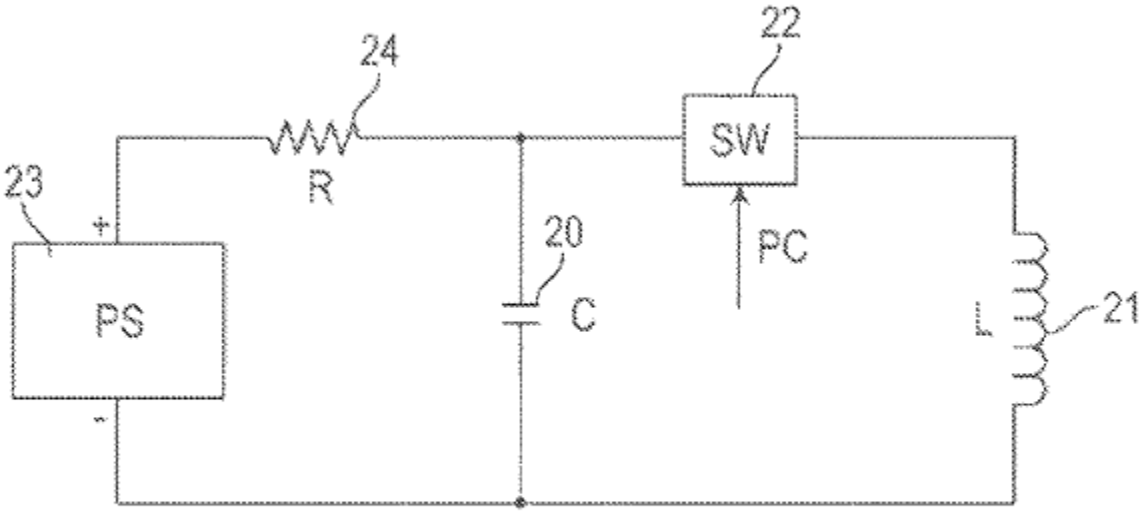


FIG. 4A

'187, Fig. 4A, '187, 6:11–18. The energy storage device is charged from the energy source, and energy from the energy storage device is provided through the switching device to the coil, and produces a magnetic field. '187, 6:15–18. The magnetic field may be a time-varying magnetic field with various repetition rates, impulse durations, and magnetic flux densities. '187, 16:6–17. Bikson, ¶¶104-107.

The device includes a "control unit" to regulate the magnetic field and radiofrequency generations, and uses a "casing" with a "cooling media" for the applicators. '187, 5:25-52, 5:65-6:2, 7:39-56. Bikson, ¶108.

B. Prosecution History

'187 issued from U.S. Application No. 15/151,012, filed 5/10/2016. Ex-1003, 1–36. Track 1, prioritized status was granted 6/3/2016. Ex-1003, 41–43. Bikson, ¶109.

There were three prior-art based rejections. In response to the first rejection (12/1/2016) over certain prior art, Applicant canceled original claims 1–30 and added new claims 31–60. Ex-1003, 51–62, 69–79. Likewise, for the second rejection (6/22/2017) over certain prior art, Applicant filed an RCE with an amendment canceling claims 31–60 and adding new claims 61–90. Ex-1003, 91–106, 137–88. Bikson, ¶110.

The third rejection (12/22/2017) was based on obviousness over Edoute-'727 (US8,979,727) in view of Rohwedder (US2006/0152301) alone or with **Ishikawa**.[3] Ex-1003, 320–29. The Examiner, in rejecting independent claim 70, simply stated "Edoute teaches a method as claimed but does not teach an energy storage device to be used in the method," and Rohwedder teaches the

[3] **Ishikawa** was cited for the proposition that the use of litz wires and the claimed wire diameter was known; and this proposition was never disputed or overcome by the applicant.

"energy storage device." Ex-1003, 324. The Examiner found various claims to be allowable for the reasons summarized in the table below. Ex-1003, 327; Bikson, ¶111.

Rather than directly addressing the obviousness rejection, Applicant again filed an amendment cancelling claims 61–90, and adding new claims 91–120. Ex-1003, 335–44. Applicant provided a chart with the amendments that purportedly showed how previous claims correspond to claims 91-120. Ex-1003, 342. According to Applicant, since claim 100 (became the issued claim 10) includes allowable subject matter from claim 74 (a transmatch), it was thus clear of the art. Ex-1003, 343. After Examiner finally rejected the claims for lacking written description (5/17/2018), and Appellant made minor amendments to the claims (7/11/2018), the Examiner allowed the claims (8/6/2018). Ex-1003, 350–354, 365–372, 381–385; Bikson, ¶112.

The table below summarizes the purported correspondence between issued independent claims and the various sets of pending claims and the reasons for allowance. *See* Ex-1003, 170-171, 327, 342-343 ("claim 109 includes original Claims 79 and 89"). Bikson, ¶113.

Issued Claims	Pending Claims	Prior Pending Claims	Reasons for Allowance: Prior Art does not teach
1	91	61	Voltage drop
2	92	62	Various magnetic field parameters
10	100	70+74	Balun transformer or transmatch
19	109	79+89	Various magnetic field parameters

C. §325(d) is inapplicable

All grounds contain at least one of these references—**Simon**, **Zarsky**, and **Park** that were not before the Examiner. The issued patent of **Burnett-'870** was cited in an IDS, but not otherwise identified or applied to reject claims during prosecution. Ex-1003, 87; *see Digital Check Corp. v. E-Imagedata Corp.*, IPR2017-00178, Pap. 6, 12-13 (Apr. 25, 2017) (instituting IPR where references were cited in an IDS but "there is no indication in the record that the Examiner rejected any claims based on either reference or that the Examiner or applicant substantively discussed either reference during prosecution").

Edoute was cited in an IDS. Although a related patent (Edoute-'727) was applied as the primary reference[4] in an obviousness combination in an office action

[4] Here, **Edoute** is applied as a secondary reference to **Simon** that was not before the Examiner.

to earlier pending claims, it was never distinguished by Applicant; rather Applicant cancelled all pending claims after Examiner applied Edoute-'727. Edoute-'727 was thus never applied to the claims at issue. *See* §V.B. The Examiner also never considered the testimony of Dr. Bikson (Ex-1002) regarding these references. Ex-1003.

Importantly, for each independent claim, the Examiner failed to consider the references and/or combinations presented herein that teach the recited features Examiner found to be missing in the prior art. Referring to the table in §V.B above, the Examiner failed to consider that a voltage drop was known and conventional and within a POSITA knowledge; that **Simon** or **Burnett-'870** teaches the various magnetic field parameters; and that **Zarsky** discloses a balun transformer and a transmatch. *See* §VIII. **Park** provides the rationale not before the Examiner on why a POSITA would modify a magnetic device to utilize the teachings of radiofrequency electrode and application in a combined treatment. The Examiner further erred by (1) applying Edoute-'727 as the primary reference, and (2) never combining **Simon** in view of Edoute-'727.

Accordingly, the "same or substantially the same art or arguments" were not previously presented to the Office during prosecution. *Thorne Research v. Trustees of Dartmouth College*, IPR2021-00491, Pap. 18, *8-9 (PTAB Aug. 12, 2021) (granting institution; finding first prong of *Advanced Bionics* not satisfied

when prior art reference considered by Examiner was combined with references not cited during prosecution); *Advanced Bionics, LLC v. Med-El Elektromedizinische Gerate GMBH*, IPR2019-01469, Pap. 6, *8-9.

VI. LEVEL OF ORDINARY SKILL IN THE ART

On or before 4/28/2015, a POSITA would have had a bachelor's degree in biomedical engineering, electrical engineering, physics, or related field, and two or more years of professional experience working with the design, development, and/or use of devices that apply electromagnetic energy to stimulate biological tissue. Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education. Bikson, ¶¶1-39.

VII. CLAIM CONSTRUCTION

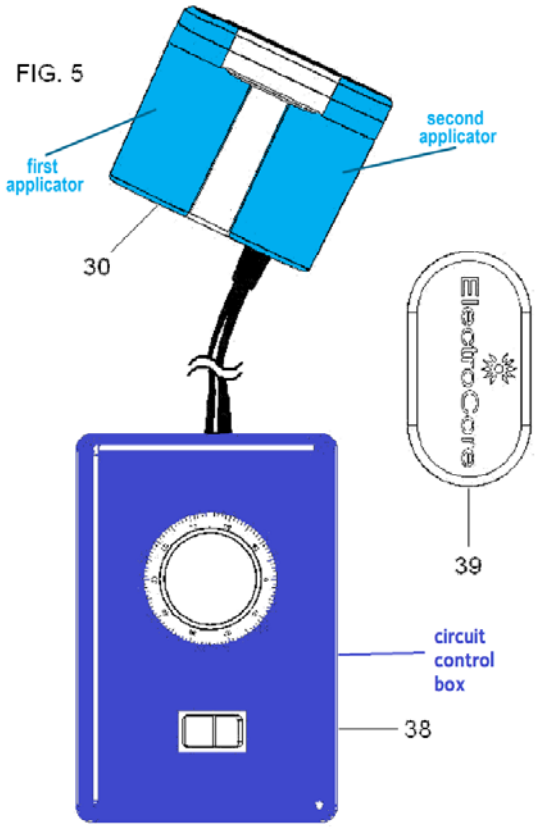
Claim terms subject to IPR are to be construed according to the *Phillips* standard applied in district court. §42.100(b). Petitioner applies the plain and ordinary meanings of terms. Only terms necessary to resolve the controversy must be construed. *Nidec Motor v. Zhongshan Broad Ocean Motor*, 868 F.3d 1013, 1017 (Fed. Cir. 2017). Bikson, ¶¶114-115.

VIII. GROUNDS OF UNPATENTABILITY

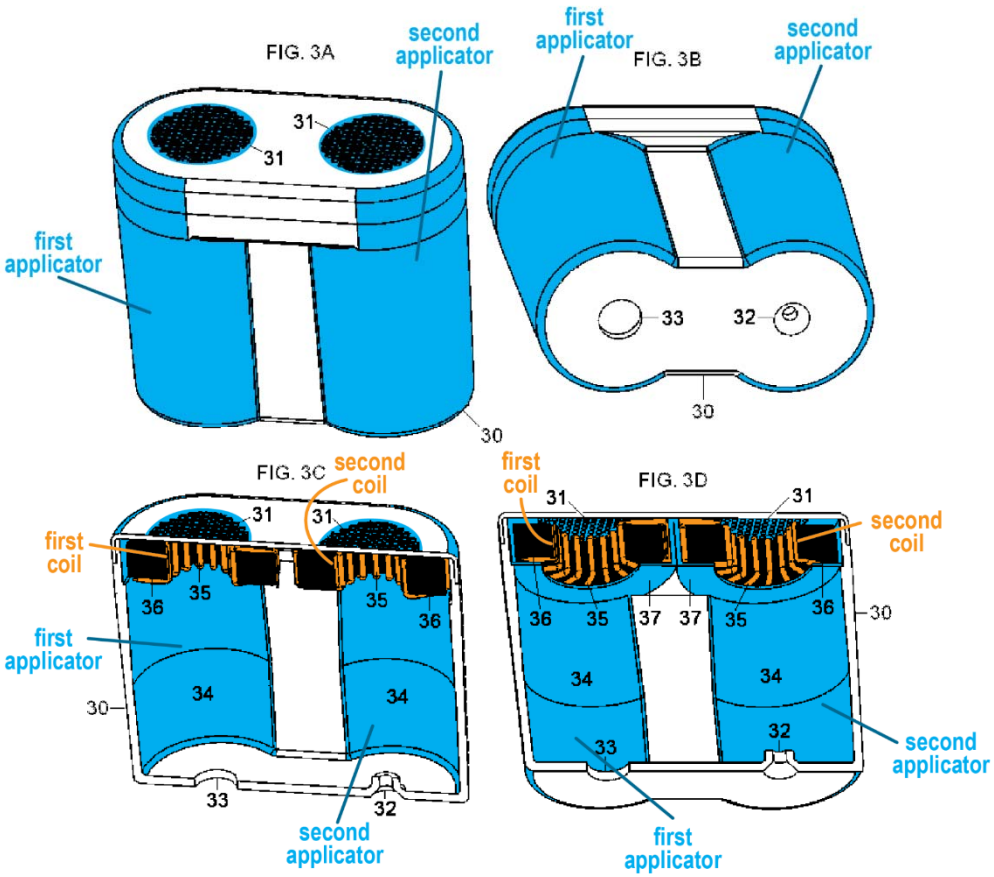
A. Ground 1: Claims 1, 19, 22-29 are rendered obvious by Simon in view of Edoute

1. Simon Overview

Simon discloses a magnetic stimulator used to deliver "energy" to "target tissue," *e.g.*, for muscle "[r]ehabilitation." Simon, *Title*, *Abstract*, [0002], [0197].



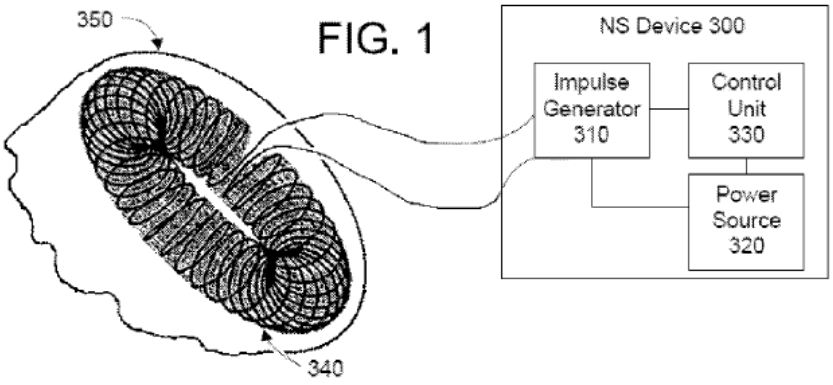
Simon, Fig. 5, [0103]. Figures 3A-3D (annotated) show **Simon's** stimulator with two **applicators** situated within a "housing," each **applicator** containing a "**coil**" that generates a time-varying magnetic field when a capacitor is "discharged." Simon, [0012], [0045], [0047], [0098]. Bikson, ¶¶116-118.



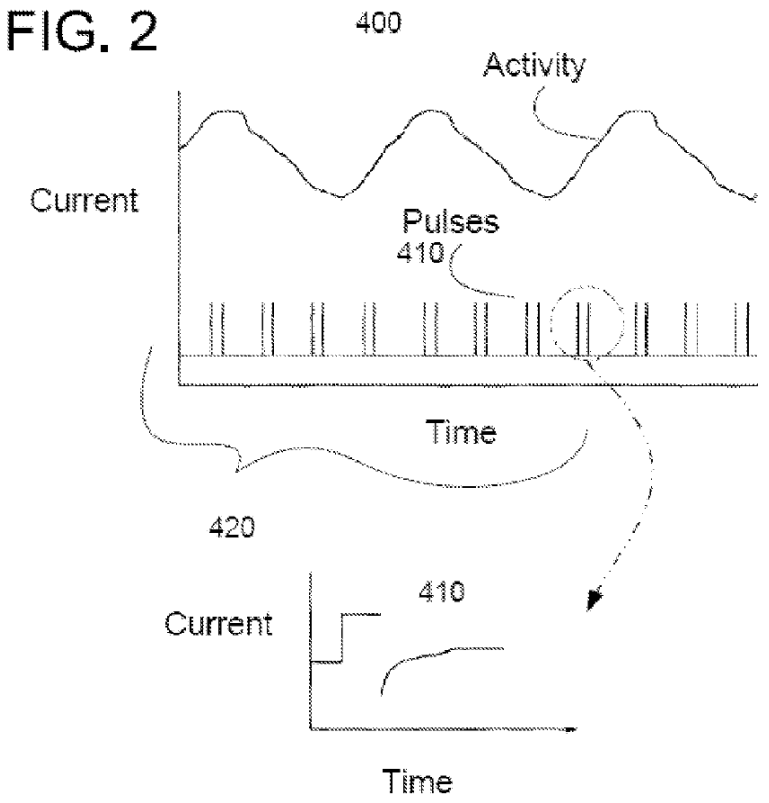
Each **coil** "induces an electromagnetic field" to apply "electrical impulses" to muscles within target body regions (*e.g.*, abdomen). Simon, [0024], [0027]-[0028], [0035], [0053]. Simon's stimulator may contain more than two **applicators**, with varying shapes and configurations for different applications based on the "anatomical location of the stimulation and determining the appropriate pulse configuration." Simon, [0031], [0100]-[0102], Fig. 4C-4D. Bikson, ¶119.

Simon's device has an "impulse generator," containing a capacitor and connected to a "control unit" causing the impulse generator to generate a signal for

each **coil**. Simon, [0019], [0057], Fig. 1. The control unit controls the capacitor via switching. Simon, [0019]. The impulse generator may contain a "bank of capacitors" discharged to coils at different times such that multiple, and serial pulses may be generated. Simon, [0019], [0063]. Bikson, ¶120.



Simon's coils generate consecutive "energy impulses" to stimulate tissue:



Simon, Fig. 2, [0002], [0029], [0035]. **Simon** teaches adjustable parameters for the stimulation signal including power level, frequency, pulse amplitude, and repetition rate. Simon, [0059], [0063]-[0064], [0104]. Bikson, ¶¶121-123. Moreover, **Simon** recognizes magnetic stimulator coils "overheat" during "extended" use, so it discloses solutions such as "cool[ing] the coils" with flowing water, air, or "ferrofluids." Simon, [0020]. Bikson, ¶124.

Simon discusses the "Agilent 33522A Function/Arbitrary Waveform Generator," which is a HF (30MHz) generator—see Simon [0057], Bikson ¶125—but to the extent argued **Simon** lacks a detailed disclosure of a high-frequency generator and radiofrequency electrode configured to apply radiofrequency waves to a patient, heating tissue, a POSITA would have found it obvious to modify **Simon**'s device to do so for the reasons discussed below in §VIII.A.3; VIII.D—*e.g.*, as the '187 patent concedes, RF stimulation was known. '187, 1:39-47. Indeed, it was also well-known and conventional that RF-and-magnetic treatments provided a complementary effect to increase skin rejuvenation, and may reduce side effects compared to separate treatments. *See,* e.g., Edoute, [0196]-[0197]; Park, [0029]-[0030], [0034]-[0036] (describing benefits when combining radiofrequency-and-magnetic treatment). Such modification would predictably work and provide the expected functionality given that **Simon** already discloses a device with applicators to provide tissue treatment, and radiofrequency electrodes

may be utilized within the applicators. Simon, [0012], [0045], [0047], [0098]. Bikson, ¶¶117-125.

2. Edoute Overview

Edoute is directed to a device for "simultaneously emit[ting] RF and magnetic pulses" to target body regions for *e.g.*, "muscle contractions." Edoute, *Abstract*, [0328], [0243]. **Edoute's** device contains electrodes 41, each containing a "coil" serving as a "pulsed electromagnetic frequency generator (2);" electrodes are adapted both to "provid[e] electromagnetic pulses…[and] apply[] heat" via "RF radiation" to a "region of a patient's skin":

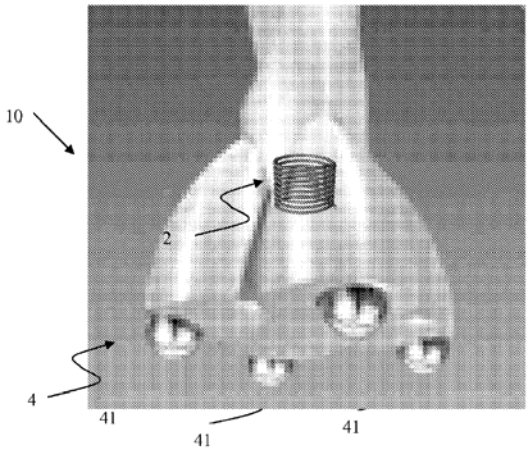


FIG. 1B

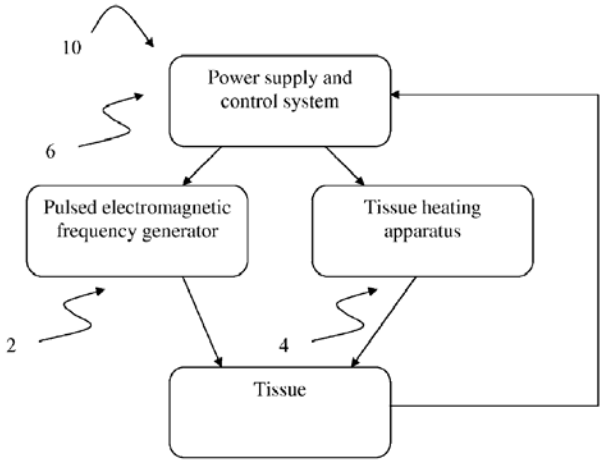


FIG. 2

Edoute, Figs. 1B, 2, [0015]-[0017], [0098]-[0099], [0197]-[0198]; [0129]-[0130] (various pulse frequencies and durations, *e.g.*, 16 or 25Hz; 5ms duration.) Bikson, ¶126. RF/heat is applied via the "**electrodes**"—"Radio Frequency" is defined as frequencies of 3Hz-30GHz. Edoute, [0021]-[0023], [0165].

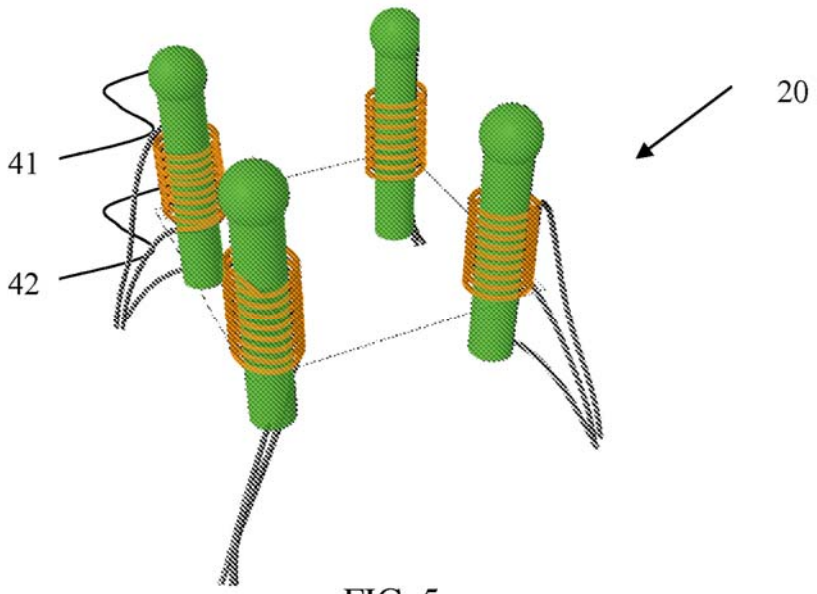


FIG. 5

Edoute, Fig. 5 (color-annotated).

Edoute describes that RF/heating of tissue via electrodes causes "tissue injury" promoting collagen fibers and resulting in "overall tightened and rejuvenated appearance of the skin." Edoute, [0201]-[0207]. Simultaneously, **Edoute's** coil generates pulsed magnetic fields that provide "non-thermal" effects on tissue, *e.g.*, there may be "muscle contractions" during treatment. Edoute, [0006]-[0008], [0041]. **Edoute** discloses a complementary effect on tissue improvement resulting from simultaneous heat (RF) and electromagnetic stimulation. Edoute, [0200] (by exposing "tissue" to "combination of regulated heat and a pulsed electromagnetic [field], a synergic effect of improving skin rejuvenation is obtained"). While **Edoute's** device applies "heat" to patient's skin, it recognizes compatibility with "a mechanism for skin cooling." Edoute, [0117].

Bikson, ¶¶127-128.

3. Motivation to Combine

Simon discusses the "Agilent 33522A Function/Arbitrary Waveform Generator," which is a HF (30MHz) generator—*see* Simon [0057], Bikson ¶129—but lacks a detailed disclosure of radiofrequency treatment generated by a HF generator and applied simultaneously to a body region with **Simon's** magnetic treatment. A POSITA would have been motivated and found it obvious to apply radiofrequency treatment to provide "skin tightening and rejuvenation," improving the overall visual appearance of a patient undergoing muscle toning treatment. *See* Edoute [0196]-[0197]. **Simon** discloses "repeated," lengthy treatments, *e.g.*, "1 to 200 minutes" per session (Simon, [0022], [0111], [0123], [0141]), including muscle "rehabilitation" (Simon, [0197]). Such treatments cause muscle toning/shaping; it was well-known that muscles "contract" while stimulated—but shaping muscles without treating skin might cause skin sagging or other unwanted visual appearances. Simon, [0158] ("signal causes the smooth muscle…to contract"), [0194], [0195]; Bikson, ¶129. **Edoute** teaches application of radiofrequency energy heats the dermis, stimulates collagen production and leads to an "overall tightened and rejuvenated appearance of the skin." Edoute, [0201]. A POSITA would have understood and found it obvious to apply radiofrequency treatment alongside magnetic treatment to improve the overall visual appearance

by tightening skin as muscles are toned/adipose tissue is reduced, *e.g.*, to provide additional skin tightness alongside muscle toning, and to prevent skin sagging or stretch marks during muscle treatment. Edoute, [0199]-[0202]; Sokolowski, [0003]-[0005] ("stimulation leads to a breakdown of fatty tissue"). Moreover, **Edoute** discloses that simultaneous RF-and-magnetic treatment may provide a complementary effect of increasing skin rejuvenation and may reduce side effects compared to separate treatments. Edoute, [0196]-[0197], [0199]-[0200]. Such modification would predictably work and provide the expected functionality given that **Simon** already discloses a device with applicators to apply treatment to the body, suggests RF treatment capability, and **Edoute** discloses utilizing a coil and an RF electrode in an applicator to apply simultaneous RF-and-magnetic treatment. Herbst, incorporated into **Simon**, additionally discloses setting repetition rates for multiple output channels such that **Simon**'s device would support simultaneous RF-and-magnetic stimulation with different frequencies. Herbst, [0031], [0037]. Bikson, ¶¶130-131.

Both **Simon** and **Edoute** are in the same field of endeavor—treatment devices using electromagnetic stimulation of tissue—also analogous art to the '187. **Simon** is directed to a "magnetic stimulation device" for "target tissue" including muscles; **Edoute** is directed to a device for tissue "rejuvenation," *e.g.* for applying "dynamic magnetic field" to "injured tissue" to promote "rapid and

improved healing." Simon, *Title*, *Abstract*, [0029]-[0030]; Edoute, *Abstract*, [0010], [0015]-[0017], [0234], [0284]. A POSITA would have recognized **Edoute** provides teachings of radiofrequency waves applied to a patient via a radiofrequency electrode such that a complementary effect is provided (Edoute, [0196]-[0197], [0199]-[0200]); such teachings could be used in **Simon's** treatment device, and applying those teachings would have been straightforward and predictably worked. Bikson, ¶132.

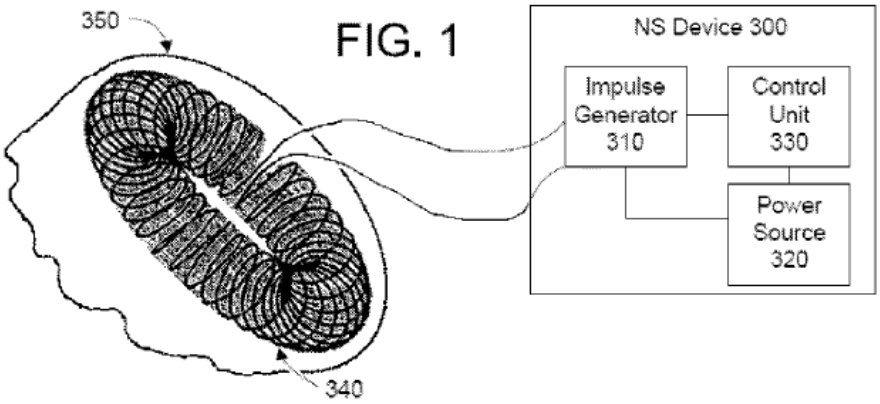
In light of the above, a POSITA would have found it routine, straightforward, and advantageous to apply **Edoute's** known details of radiofrequency treatment teachings to **Simon's** magnetic stimulation device, and would have known such a combination (yielding the claimed limitations) would predictably work and provide the expected functionality. Bikson, ¶133; *see also KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 401-02 (2007).

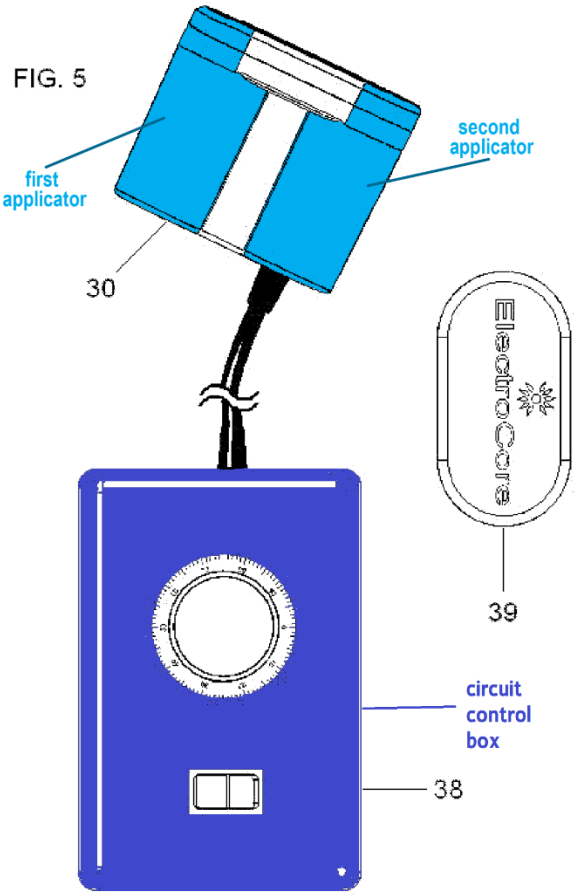
4. Claim Charts

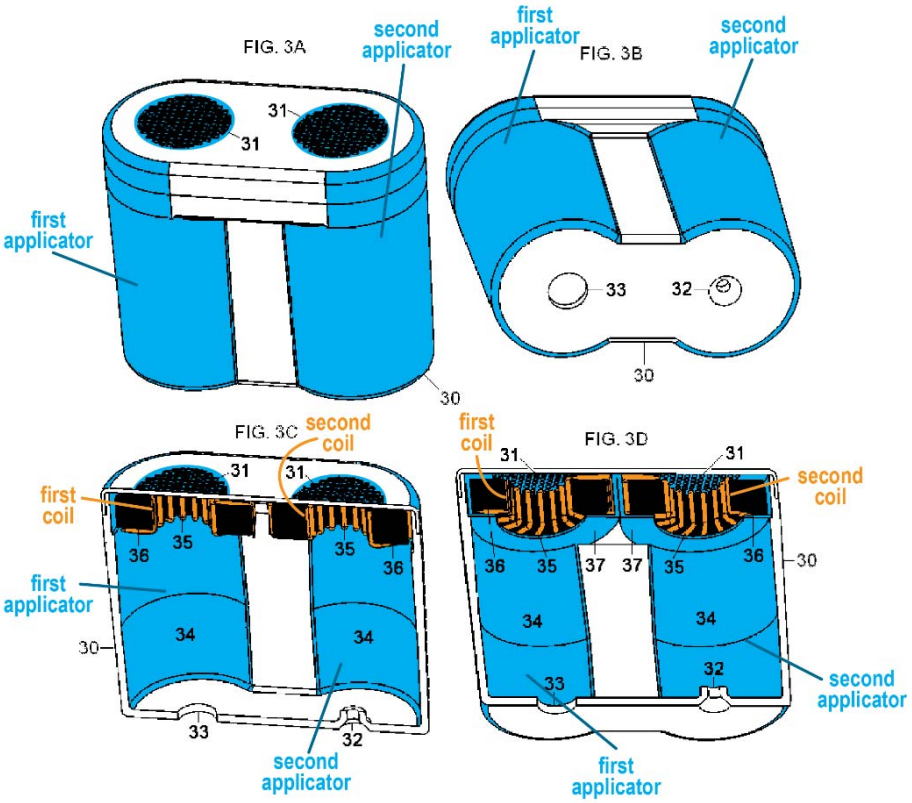
a. Independent Claims 1 and 19

Claim Elements	Simon in view of Edoute
[1.pre][5] A method of treatment of a target biological structure of a patient using a treatment device which includes a	**Simon teaches a method of treatment of a target biological structure of a patient using a treatment device which includes a connection to an energy source,** (*e.g.*, "power source")**, a high-frequency generator** (*e.g.*, "Agilent 33522A Function/Arbitrary Waveform Generator,")**, a radiofrequency electrode** (*e.g.*, "electrode," "coil" in second applicator)**, an energy storage device** (*e.g.*, "capacitor")

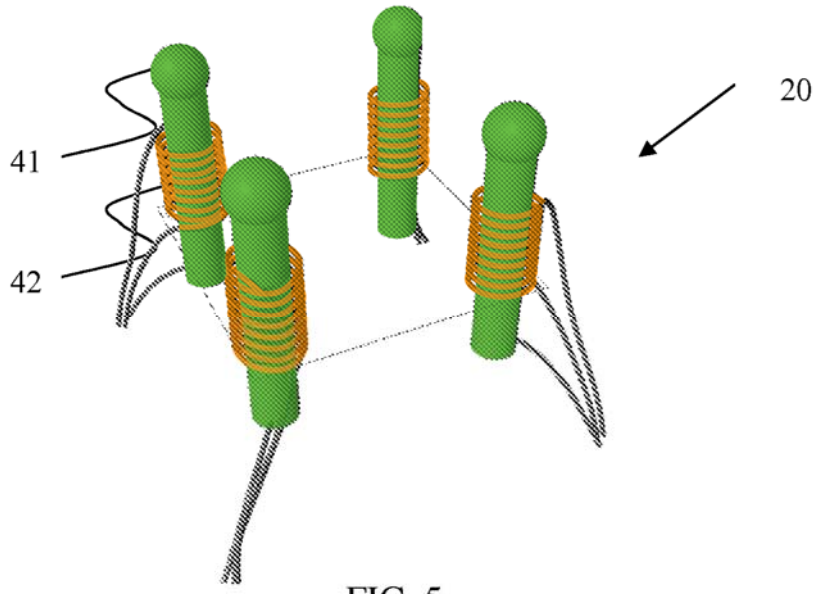
[5] To the extent the preambles are limiting, they are met by the art of record.

Claim Elements	Simon in view of Edoute
connection to an energy source, a high-frequency generator, a radiofrequency electrode, an energy storage device electrically connected to a switching device and a magnetic field generating device, comprising:	**electrically connected to a switching device** (*e.g.*, "electronic switch") **and a magnetic field generating device** (*e.g.*, "coil")**.** **Simon** discloses a device with "an impulse generator" coupled to a "power source" and "control unit":  Simon, Fig. 1, [0054]. The "impulse generator" contains an energy storage device: "a capacitor," which stores energy when "[charged]…under the control of a control unit." Simon, [0019]. **Simon** device uses a "stimulator 30" containing **applicators** and connected to "**circuit control box** 38":

Claim Elements	Simon in view of Edoute
	 Simon, Fig. 5 (annotated); [0103]. The stimulator may have two **applicators** "that lie side-by-side," each containing a "**coil[]**" disposed in "its own housing":

Claim Elements	Simon in view of Edoute
	 Simon, Fig. 3A-D (annotated), [0031], [0098]. **Simon** is not limited to two **applicators**; the shapes and configurations vary based on "anatomical location of the stimulation." Simon, [0031], [0100]-[0102], Fig. 4C-4D. A capacitor is "discharged" through each **coil** when a user wishes to "apply [a] stimulus." Simon, [0019], [0025]. Bikson ¶¶134-139, 84-85. **Simon** discloses discharging a capacitor "through the coil via an electronic switch." Simon, [0019]; [0103] (using an "on/off switch" for "circuit control"). Bikson ¶¶140-141. **Simon** discusses the "Agilent 33522A Function/Arbitrary Waveform Generator," which is a HF generator (*e.g.*, 30MHz frequency). Simon, [0057], Bikson ¶142. It was known that high-frequency encompasses radiofrequency. *See, e.g.*, '187, 15:39-46 ("HF…generator" provides "energy for radiofrequency treatment"); Bikson ¶142.

Claim Elements	Simon in view of Edoute
	Simon discloses a two-applicator embodiment where one applicator may be used for RF and the second coil may be used for magnetic treatment. Simon, Fig. 5, [0031], [0055], [0078]-[0079]. The '187 concedes that a "coil [may] be the electrode for radiofrequency treatment," and Simon discloses each applicator contains a "coil," such that one coil may be used for RF. Simon, [0031] ("two…coils"), [0098]; '187, 15:65-66; Bikson, ¶143. **Simon** additionally discloses electrodes which may be used for radiofrequency treatment when connected to the HF generator. **Simon** recognizes using "electrodes" on the "surface of the skin…without breaking the skin" for treatment. Simon, [0014]. Bikson ¶144. To the extent argued **Simon** does not disclose a high-frequency generator or radiofrequency electrode, **Edoute discloses a high-frequency generator** (*e.g.*, "electrical output device")**, a radiofrequency electrode** (*e.g.*, "electrode")**.** **Edoute** is directed to a device for "simultaneously emit[ting] RF and magnetic pulses" to target body regions for *e.g.*, "superficial muscle contractions." Edoute, *Abstract*, [0328], [0243]. As shown in Fig. 5, **Edoute's** device contains a high-frequency generator, *i.e.* "electrical output device" to "generate RF…energy" as well as "**electrodes**" placed on a region of a patient to "apply said RF energy." Edoute, [0021]-[0023]. **Edoute's** "electrical output device" is the claimed "HF…generator" which, in the '187, "provid[es] energy for radiofrequency treatment." '187, 15:39-46. Indeed, **Edoute's** electrical output device may operate in high-frequency ranges; **Edoute** defines "Radio Frequency (RF)" as being between 3Hz-30GHz. Edoute. [0165].

Claim Elements	Simon in view of Edoute
	 FIG. 5 POSITAs would have been motivated and found it obvious to apply **Edoute's** simultaneous RF-and-magnetic stimulation teaching to **Simon's** device to increase skin tightness when toning muscles in order to improve overall visual appearance by tightening skin as muscles are toned/adipose tissue is reduced, *e.g.*, to provide additional skin tightness alongside muscle toning, and to prevent skin sagging or stretch marks during muscle treatment. Edoute, [0199]-[0202] (application of RF/heat leads to "overall tightened and rejuvenated appearance of the skin"); Sokolowski, [0003]-[0005] ("stimulation leads to a breakdown of fatty tissue"); §VIII.A.3. Moreover, **Edoute** discloses that simultaneous RF-and-magnetic treatment may provide a complementary effect of increasing skin rejuvenation and may reduce side effects compared to separate treatments. Edoute, [0196]-[0197], [0199]-[0200]. Bikson, ¶¶145-148, 72-75.
[1.a] a. charging the energy storage	**Simon discloses charging the energy storage device** (*e.g.*, "capacitor") **from the energy source** (*e.g.*, "power source")**.**

Claim Elements	Simon in view of Edoute
device from the energy source;	*See* [1.pre]—**Simon's** "capacitor" stores energy when "[charged]…under the control of a control unit." Simon, [0019]. Bikson, ¶¶149-150, 84-85.
[1.b] b. providing energy from the energy storage device to the magnetic field generating device to generate a time-varying magnetic field;	**Simon discloses providing energy from the energy storage device** (*e.g.*, "capacitor") **to the magnetic field generating device** (*e.g.*, "coil") **to generate a time-varying magnetic field.** *See* [1.pre]-[1.a]—A capacitor is "discharged" through each of **Simon's** coils when a user wishes to "apply [a] stimulus." Simon, [0019], [0025]. For a two-coil device, **Simon** discloses "first and second time-varying magnetic fields" are generated by "first and second coils." Simon, [0025]. Bikson, ¶¶151-153.
[1.c] c. applying the time-varying magnetic field to the patient;	**Simon discloses applying the time varying-magnetic field to a patient.** *See* [1.b]—**Simon** discloses "methods of therapy," *e.g.* muscle "rehabilitation," when **Simon's** device induces a "time-varying magnetic field" to apply "energy" to a target region within a "patient." Simon, *Title*, *Abstract*, [0015], [0023]-[0024], [0053], [0197]. For example, **Simon** discloses placing applicators on abdomen (Simon, [0035]), the resulting consecutive "electrical impulses" stimulate a patient's muscles/tissues. Simon, *Abstract*, [0012], [0053], [0060]-[0061], [0083], [0105], Fig. 2. Bikson, ¶¶154-156.
[1.d] d. providing energy from the	**Simon discloses an energy source** (*e.g.*, "power source")**.**

Claim Elements	Simon in view of Edoute
energy source to the high-frequency generator in order to provide the energy to the radiofrequency electrode;	*See* [1.pre]. **Simon in view of Edoute teaches providing energy to the high-frequency generator** (*e.g.*, "electrical output device" of Edoute) **in order to provide the energy to the radiofrequency electrode** (*e.g.*, "electrode" of Edoute)**.** *See* [1.pre]—**Edoute** discloses an "electrical output device adapted to generate RF electromagnetic energy," as well as electrodes "coupled" to the electrical output device and adapted to "apply said RF energy" to the patient. Edoute, [0021]-[0023], [0074]-[0078]. POSITAs would have been motivated to apply **Edoute's** RF-and-magnetic stimulation treatment teachings in implementing **Simon's** device for the benefit of a combined treatment—*see* [1.pre]; §VIII.A.3. Bikson, ¶¶157-160.
[1.e] e. generating radiofrequency waves with a frequency of at least 1 MHz by the radiofrequency electrode;[6]	**Simon in view of Edoute teaches generating radiofrequency waves with a frequency of at least 1 MHz** (*e.g.*, Edoute's "300 GHz") **by the radiofrequency electrode** (*e.g.*, Edoute's "electrode")**.** *See* [1.pre], [1.d]—**Edoute** discloses applying "RF radiation," *e.g.*, via "electrodes," to a patient's "dermis." Edoute, [0013], [0020]. **Edoute** defines radio frequency/RF as referring to "part of the electromagnetic spectrum with frequency range of about 3 Hz to 300 GHz." Edoute, [0165]-[0166]. Heat is applied to the patient's skin through "at least one electrode…in direct physical contact with the skin" or "at

[6] For claim limitations [1.e], [1.h]-[1.i], [19.b]-[19.c], [20], [22], [26], [29] reciting a specific range, the claimed range is obvious in view of prior art's teachings that "overlap or lie inside" the range or even do not overlap but are merely close, absent an explicit showing that the claimed range is critical in achieving unexpected results relative to the prior art's range. MPEP § 2144.05; *see also In re Wertheim,* 541 F.2d 257 (CCPA 1976); *In re Brandt*, 886 F.3d 1171, 1177, (Fed. Cir. 2018). The prior art teaches the claimed range and the '187 specification describes no such unexpected results.

Claim Elements	Simon in view of Edoute
	least one electrode…not in physical contact with the skin." Edoute, [0236]-[0238]. **Edoute** indicates that pulsed radiofrequency treatments were approved for use on patients by the FDA "two decades" prior to **Edoute's** priority date. Edoute, [0008]. POSITAs would have been motivated to apply **Edoute's** RF-and-magnetic stimulation treatment teachings in implementing **Simon's** device for the benefit of a combined treatment—*see* [1.pre]; §VIII.A.3. Bikson, ¶¶161-164, 73-75.
[1.f] f. applying the radiofrequency waves to the patient; and	**Simon in view of Edoute teaches applying the radiofrequency waves to the patient.** *See* [1.pre], [1.e]—**Edoute** discloses, *e.g.*, applying treatment via a "patient's skin." Edoute, [0015]-[0017]. POSITAs would have been motivated to apply **Edoute's** RF-and-magnetic stimulation treatment teachings in implementing **Simon's** device for the benefit of a combined treatment—*see* [1.pre]; §VIII.A.3. Bikson, ¶¶165-166, 73-75.
[1.g] g. heating the target biological structure by the radiofrequency waves;	**Simon in view of Edoute teaches heating the target biological structure by the radiofrequency waves.** *See* [1.pre], [1.e]-[1.f]—**Edoute's** device contains a "deep tissue diathermy device" used to "apply heat" to a region of a patient. Edoute, [0017]. "RF radiation" is used to "heat[] the dermis" for, *e.g.*, "skin tightening." Edoute, [0013]-[0014], [0003] (describing application of heat on "dermis" well-known since at least 2004), [0099]. For example, heat application using RF waves may "cause[] contraction and tightening of collagen fibers" or collagen production, "result[ing] in an overall tightened and rejuvenated appearance of the skin." Edoute, [0201].

Claim Elements	Simon in view of Edoute
	POSITAs would have been motivated to apply **Edoute's** RF-and-magnetic stimulation treatment teachings in implementing **Simon's** device for the benefit of a combined treatment—*see* [1.pre]; §VIII.A.3. Bikson, ¶¶167-170, 72-75.
[1.h] h. wherein the magnetic field has a repetition rate in a range of 1 to 100 Hz;	**Simon discloses wherein the magnetic field has a repetition rate in a range of 1 to 100 Hz** (*e.g.,* "15 Hz to 50 Hz")**.** *See* [1.b]-[1.c]—**Simon** discloses a "stimulator" "adjustable in regard to amplitude, duration, repetition rate and other variables." Simon, [0020], [0063], [0103]. **Simon** discloses "modulating impulse signal" at a "frequency" (*i.e.*, repetition rate) "about 1 Hz or greater, such as between about 15 Hz to 50 Hz". Simon, [0064]; *see also id.,* [0030], [0033], cl. 8. Bikson, ¶¶171-173.
[1.i] i. wherein a voltage drop between successive peak amplitudes in the energy storage device is up to 21%.	**Simon teaches a voltage drop between successive peak amplitudes in the energy storage device** (*e.g.*, "capacitor") **is up to 21%.** *See* [1.pre]–[1.c], [1.h]—To the extent argued **Simon** does not explicitly disclose a certain voltage drop up to 21%, POSITAs would have been motivated and found it obvious to operate **Simon's** device with a constant voltage, or a voltage drop between successive peak amplitudes up to 21%, to minimize the capacitor's charge time in repetitive discharge timing applications, increase repetition rate by recharging the energy storage during a previous pulse, and to still deliver a therapeutic amplitude as desired by the patient, as was well-known and conventional in the art. *See, e.g.*, Polson, 3:38-40 ("voltage…on the discharge capacitor is about 80% of its initial magnitude"); 1:37-54 (describing "replenish[ing] the charge" on a discharge capacitor such that "rate of discharge pulses" is increased); '187, 6:66-7:3 (similarly to Polson, a small voltage drop allows for "increase [in]…repetition rate" because energy storage device is recharged during previous pulse). Bikson, ¶97-99.

Claim Elements	Simon in view of Edoute
	POSITAs would have been motivated and found it obvious to operate **Simon** so that a voltage drop between the capacitor's successive peak amplitudes is up to 21%, such that repetition rate may be increased by charging capacitors during the prior pulse, and to minimize any drop in the magnetic field's flux density during patient treatment. Bikson, ¶¶174-176.

Claim Elements	Simon in view of Edoute
[19.pre] A method for treating a biological structure of a patient by a time-varying magnetic field and radiofrequency waves comprising:	**Simon in view of Edoute teaches discloses a method for treating a biological structure of a patient by a time-varying magnetic field and radiofrequency waves.** *See* [1.b]-[1.g]. Bikson, ¶¶177-178.
[19.a] a. providing energy from an energy source to an energy storage device and/or to a high-frequency generator;	**Simon discloses providing energy from an energy source** (*e.g.*, "power source") **to an energy storage device** (*e.g.*, "capacitor")**.** *See* [1.pre]-[1.b]. Bikson, ¶¶179-180.
[19.b] b. providing energy from the energy storage device to a magnetic field generating device in order to generate the time-varying magnetic field with a magnetic flux	**Simon discloses providing energy from the energy storage device** (*e.g.*, "capacitor") **to a magnetic field generating device** (*e.g.*, "coil") **in order to generate the time-varying magnetic field with a magnetic flux density in a range of 0.15 to 7 T, a repetition rate in a range of 1 to 700 Hz** (*e.g.*, "15 Hz to 50 Hz")**, and with an impulse duration in a range of 10 to 900 µs** (*e.g.*, "10-1000 microseconds")**.** *See* [1.b], [1.h]—**Simon** discloses that "current passing through the coil produces a magnetic field within the core of about 0.1 to 2 Tesla." Simon, [0030], [0104].

Claim Elements	Simon in view of Edoute
density in a range of 0.15 to 7 T, a repetition rate in a range of 1 to 700 Hz, and with an impulse duration in a range of 10 to 900 μs;	Because **Simon's** coil is "wound around" (*i.e.*, touching) the core, magnetic field flux density at the core is also at surfaces of the coils. Simon, [0029]. **Simon** indicates that "coil" refers to current-carrying wire *and* to "core material," so flux density at the core is also the flux density at surfaces of the coils. Simon, [0015]. It was also known in the art to measure magnetic field strength at the coil surface where stimulus strength is at its highest. *E.g.*, Magstim, 8. Simon discloses a "pulse" (referred to as "impulse" in the language of the patent) duration. Bikson, ¶45-53. Simon, cl. 9, [0033]. The impulse duration is, *e.g.*, about 50-1000 microseconds. Simon, cls. 9-10, [0030], [0033] ("pulse duration of between about 10-1000 microseconds"), [0104]. Bikson, ¶¶181-186.
[19.c] c. providing energy from the high-frequency generator to a radiofrequency electrode in order to generate the radiofrequency waves with a frequency in a range of 1 MHz to 900 GHz;	**Simon in view of Edoute discloses providing energy from the high-frequency generator** (*e.g.*, Edoute's "electrical output device") **to a radiofrequency electrode** (*e.g.*, Edoute's "electrode") **in order to generate the radiofrequency waves with a frequency in a range of 1 MHz to 900 GHz.** *See* [1.d]-[1.e]. Bikson, ¶¶187-188.
[19.d] d. applying the time-varying magnetic field to at least one body region including thighs, buttocks, abdomen, hips or arms of the patient	**Simon in view of Edoute teaches applying the time-varying magnetic field to at least one body region including abdomen** (*e.g.*, "abdomen") **of the patient in order to cause a muscle contraction** (*e.g.*, "contract") **and the radiofrequency waves heating the at least one body region of the patient.**

Claim Elements	Simon in view of Edoute
in order to cause a muscle contraction and the radiofrequency waves heating the at least one body region of the patient; and	*See* [1.b], [1.g]—**Simon** discloses treating the "abdomen" or the "arms" of a patient. Simon, [0035], [0083]. **Simon** teaches—as was well-known—that muscles "contract" while stimulated. Simon, [0158] ("signal causes the smooth muscle…to contract"), [0194], [0195]; Belanger, 234 (contraction leads to muscles getting "larger and stronger"). POSITAs would have been motivated to apply **Edoute's** RF-and-magnetic stimulation treatment teachings in implementing **Simon's** device for the benefit of a combined treatment as **Edoute** discloses heating causes skin rejuvenation—*see* [1.pre]; §VIII.A.3. Bikson, ¶¶189-192, 43-75.
[19.e] e. using a signal from a sensor measuring a physical quantity including one or more of voltage, current, a phase shift, a magnetic flux density, a temperature, an electric field intensity, a distance or an impedance in order to adjust an output power applied to the patient.	**Simon teaches using a signal from a sensor** (*e.g.*, "sensors") **measuring a physical quantity including one or more of voltage, current, a phase shift, a magnetic flux density, a temperature, an electric field intensity, a distance or an impedance** (*e.g.*, "impedance") **in order to adjust an output power** (*e.g.*, "power level") **applied to the patient.** **Simon** discloses adjusting "nerve or tissue stimulation" "parameters" such as "power level" during treatment. Simon, [0059]. For example, **Simon** fully incorporates Herbst for its disclosure of "a measuring stage" which measures and displays "outputs of various sensors" such that the system's user may adjust the "electrical stimulation signal" manually or automatically based on "feedback" and the "user can then observe the effect of this signal on a substance being treated." Simon, [0063]. The "sensors" in Herbst may measure "current, magnetic field, voltage, impedance, [and/or] temperature." Herbst, [0067]. **Simon** further discloses measuring "impedance" through "commercially available" devices/sensors such that, *e.g.*, "power of the stimulating coil may be modulated" when

Claim Elements	Simon in view of Edoute
	impedance changes are detected. Simon, [0185]-[0186], [0195]. Bikson ¶¶193-195.

b. Dependent Claims 22-29

Claim Elements	Simon in view of Edoute
[22] The method of claim 19 wherein a voltage drop between two successive peak amplitudes output from the energy storage device is not higher than 21%.	**Simon teaches a voltage drop between two successive peak amplitudes output from the energy storage device is not higher than 21%.** *See* [1.i]. Bikson, ¶¶196-197, 97-99.
[23] The method of claim 19 wherein the energy storage device is in a serial connection with the magnetic field generating device.	**Simon discloses an energy storage device** (*e.g.*, "capacitor") **in a serial connection with a magnetic field generating device** (*e.g.*, "coil"). *See* [1.pre], [1.b]—**Simon** discloses its "coil" may be connected either "in series or in parallel" to "impulse generator 310" which contains a "capacitor" to generate magnetic fields. Simon, [0054], [0019] ("capacitor in the impulse generator"). Bikson, ¶¶198-199, 84-85.
[24] The method of claim 19 further comprising directing a cooling media in a direction parallel to the magnetic field generating device.	**Simon teaches cooling the magnetic field generating device.** **Simon** recognizes that "coils…overheat…over an extended period of time" and needed cooling. Simon, [0020]. **Simon** discloses that known cooling solutions existed, *e.g.*, "cool[ing] the coils with flowing water or air" or with

Claim Elements	Simon in view of Edoute
	"ferrofluids," which are known to be oil-based—and oil was also known as a coolant. Simon, [0020] (citing Ghiron). POSITAs would have understood **Simon** directs a cooling fluid in a direction parallel to the coils because the fluid line goes alongside with and into the coils such that the cooling fluid flows through the coils to maximize surface area and time contacting the coils to efficiently dissipate heat. *See* '187, Fig. 2 (fluid flows alongside the coils as indicated by the arrows). *See* §VIII.A.3. Bikson, ¶¶200-203, 86-90.
[25] The method of claim 19 further comprising directing a cooling media by a blower on a circumference of the magnetic field generating device.	**Simon teaches cooling the magnetic field generating device.** *See* [24]—**Simon** discloses "cool[ing] the coils with…air," *i.e.*, a blower. Simon, [0020]. Moreover, **Simon** cites Ghiron, which teaches it was well-known and conventional to use an air blower to move air in a magnetic field generation device. *See, e.g.*, Ghiron, 1:57-60 ("Conventional cooling solutions typically involve the use of …air cooling mechanism [that] may involve a fan that rapidly circulates cooled or room temperature air past the magnetic device."). Bikson, ¶¶204-205, 86-90.
[26] The method of claim 19 further comprising operating a treatment device including the magnetic field generating device to maintain a temperature of a casing of the magnetic field	**Simon teaches operating a treatment device including the magnetic field generating device to maintain a temperature of a casing of the magnetic field generating device.** *See* [1.pre], [19.e]—**Simon** recognizes maintaining device temperature to prevent "heat…[at] unacceptable levels. Simon, [0020]. **Simon** cites Ghiron for its disclosures of "cooling," and Ghiron indicates it was well-known to maintain casing temperature <43°C as was required by the FDA. Ghiron, 1:25-29 ("temperature of a magnetic stimulation device…should be kept below approximately 41.5° C to stay within…FDA guidelines"); *see also* Edoute,

Claim Elements	Simon in view of Edoute
generating device up to 43° C.	[0084], [0241] ("safe treatment parameters" of 30-80° "Celsius"); [0035]. Bikson, ¶¶206-207.
[27] The method of claim 19 wherein the sensor is in a treatment device including the magnetic field generating device and/or the radiofrequency electrode.	**Simon in view of Edoute teaches the sensor** (*e.g.*, "sensors") **is in a treatment device including the magnetic field generating device** (*e.g.*, "coil") **and/or the radiofrequency electrode** (*e.g.*, Edoute's "electrode")**.** *See* [1.pre], [19.e]—**Simon** discloses using a "measuring stage" containing "sensors" within its device. POSITAs would have been motivated to apply **Edoute's** RF-and-magnetic stimulation treatment teachings in implementing **Simon's** device for the benefit of a combined treatment as **Edoute** discloses heating causes skin rejuvenation—*see* [1.pre]; §VIII.A.3. Bikson, ¶¶208-211, 72-75.
[28] The method of claim 19 further comprising causing a repeated muscle contraction.	**Simon teaches causing a repeated muscle contraction.** *See* [1.pre], [1.b]-[1.c]—**Simon** discloses applying consecutive "electrical impulses," induced by a magnetic field, to stimulate muscles/tissues causing repeated muscle contraction. Simon, *Abstract*, [0012], [0053], [0060]-[0061], [0083], [0105], Fig. 2. **Simon** teaches—as was well-known—that muscles "contract" while stimulated by each plurality of pulses. Simon, [0158] ("signal causes the smooth muscle…to contract"), [0194], [0195]. It was known that using biphasic pulsed current to stimulate muscles causing "serial bouts" of muscle "contractions" would allow muscle strengthening and enhancement—getting "larger and stronger," thereby toning them. *See, e.g.*, Belanger, 223-234, 234. Accordingly**,** **Simon** teaches applying consecutive pulses (which includes first/second/third pluralities of pulses) of a magnetic field to muscle fibers causing multiple contractions. Bikson, ¶¶212-214, 43-71.

Claim Elements	Simon in view of Edoute
[29] The method of claim 19 further comprising applying the radiofrequency waves with energy up to 400 W.	**Simon in view of Edoute teaches applying the radiofrequency waves with energy up to 400 W.** *See* [1.d]-[1.g]—**Edoute** discloses applying radiofrequency, and further discloses that "heat radiation parameters" include "power P"—power units are in Watts. Edoute, [0040]-[0042]. Edoute leaves the exact radiofrequency power to a POSITA, who would have been motivated to apply radiofrequency waves with energy up to 400W, especially because Edoute lists "0-100 Watt" as safe treatment parameters for the magnetic stimulation (Edoute, [0241]-[0242]) and warns against treating using radiation parameters that are "unsafe," which would include overly high-powered radiation that might injure the patient's skin beyond what is required for therapeutic effect. Edoute, [0293], [0201] (describing a certain level of "tissue injury" produces skin tightening, but POSITAs would understand further injury would be detrimental). Moreover, it was well-known to use radiofrequency waves with energy up to 400W. Zarsky, cl. 4, [0027] ("radio frequency…30-400 W per pulse"). POSITAs would have been motivated to apply **Edoute's** RF-and-magnetic stimulation treatment teachings in implementing **Simon's** device for the benefit of a combined treatment as **Edoute** discloses heating causes skin rejuvenation—*see* [1.pre]; §VIII.A.3. Bikson ¶¶215-218, 72-75.

B. Ground 2: Claims 20-21 are rendered obvious by Simon in view of Edoute and Ishikawa

Claims 19 (from which Claims 20-21 depend) is rendered obvious by **Simon** in view of **Edoute**—*see* Ground 1; and Claims 20-21 are rendered obvious in

further view of **Ishikawa disclosing the magnetic field generating device** (*e.g.*, "coil") **includes a conductor diameter** (*e.g.*, "[d]iameter of…conductor portion") **less than 3mm** (*e.g.*, "0.2-1.5mm"); and **the magnetic field generating device includes a litz-wire** (*e.g.*, "litz wire coil"). Bikson, ¶220; *see* Ground 1, [1.pre], [1.b].

Ishikawa is directed to a method for "magnetically stimulating" the "body" by applying a time-varying magnetic field to "nerve," "muscle," or "tissue." Ishikawa, *Abstract*, [0065], [0002]. A "litz wire coil" is used to supply "pulse[d] electric current" to the body via a magnetic field. Ishikawa, [0002]. **Ishikawa** teaches that "various…coil devices for magnetic treatment were known," and discloses using a "litz wire coil" in such devices to prevent coils overheating, causing "danger of burn" and to increase "power consumption efficiency and stimulation efficiency." Ishikawa, [0005]-[0006], [0101]. **Ishikawa** discloses exemplary wire diameter of "0.2-1.5mm." Ishikawa, [0046]. Bikson ¶221.

A POSITA would have been motivated to apply **Ishikawa's** "litz wire coil" to **Simon's** magnetic stimulation device in order to prevent "burn[ing]" a patient. Ishikawa, [0002], [0005]-[0006]; Simon, [0020] (warning against coil "overheat[ing]"). **Simon** discloses a device having "wire…coil[s]." Simon, [0015], [0046], [0097]. However, Simon leaves the wire choice/wire thickness to a POSITA. **Ishikawa** discloses a "litz wire coil" for "magnetic treatment" systems

that prevents high coil resistance which may lead to electrical loss as well as heat generation causing "danger of burn." *See, e.g.*, Ishikawa, *Abstract*, [0005]-[0006], [0039], [0046]. **Ishikawa** further discloses that using a "litz wire" coil may increase "power consumption efficiency and stimulation efficiency." Ishikawa, [0101]. **Ishikawa** discloses the diameter of the "conductor portion" including "bare wire" of its "litz wire coil" is "0.2-1.5mm." Ishikawa, *Abstract*, [0039], [0046]; '187, 4:34-37 (noting wire diameter is claimed "conductor diameter").

A POSITA would have been motivated to use **Ishikawa's** disclosure of litz wire in **Simon's** coil such that "overheat[ing]" of the coils may be reduced and so that "power consumption efficiency and stimulation efficiency" are advantageously increased. Ishikawa, [0006], [0101]; Simon, [0020]. Moreover, **Ishikawa's** litz wire falls within the claimed conductor diameter range. Bikson, ¶¶222-223.

Ishikawa is in the same field of endeavor as **Simon, Edoute**, and the '187 (*see* §VIII.A.3): electromagnetic stimulation of a patient's body. Ishikawa, *Abstract*, [0065], [0002]. Thus, **Ishikawa** is also analogous art to the '187. A POSITA would have recognized **Ishikawa** provides additional details regarding **Simon's** coil used to apply magnetic stimulation, resulting in reduced "burn" risk as well as higher "power consumption efficiency and stimulation efficiency," so modifying **Simon** with the teachings of **Ishikawa** magnetic stimulation device

would have been straightforward and predictably worked. Ishikawa, [0005]-[0006], [0101], Bikson, ¶224.

In light of the above, POSITAs would have found it routine, straightforward and advantageous to modify **Simon's** device to utilize **Ishikawa's** "0.2-1.5mm" "litz wire coil" teachings in view of **Simon's** disclosure of avoiding coil "overheat[ing]" (Simon, [0041]) and of increasing stimulation "effic[iency]" (Simon, [0037]), and would have known such a combination (yielding the claimed limitations) would predictably work and provide the expected functionality. *See KSR Intern. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1731 (2007). Bikson, ¶225.

C. Ground 3: Claim 30 is rendered obvious by Simon in view of Edoute and Zarsky

1. Zarsky Overview

Zarsky is directed to applying electromagnetic energy, specifically radiofrequency, to heat subcutaneous tissues and tightening skin. Zarsky, *Abstract*, [0019]. Figure 1 shows the schematic diagram of a "system 16" with "electrodes 6" for applying radiofrequency to a target body region. Zarsky, [0019], [0024]. Bikson, ¶226.

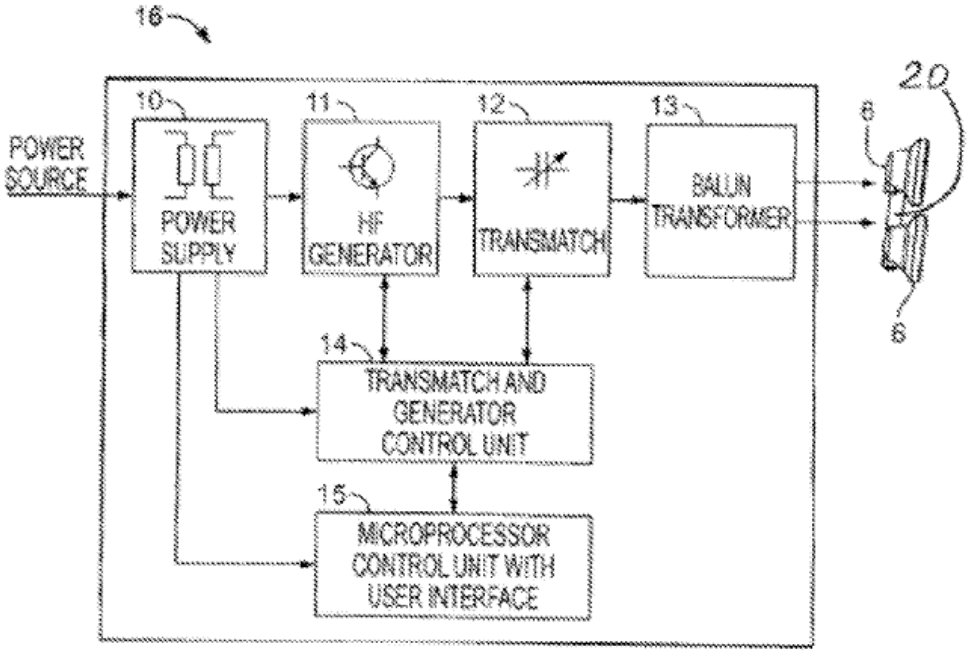


FIG. 1

Figure 1 illustrates high frequency (HF) generator 11 is connected to a power supply 10 receiving energy from a power source, a transmatch 12, and a balun transformer 13, and microprocessor control unit controls generation of the RF waves. Zarsky, [0019]–[0021]; Bikson, ¶227.

2. Discussion

Claim 19 (from which claim 30 depends) is rendered obvious by **Simon** in view of **Edoute**—*see* Ground 1; and Claim 30 is rendered obvious in further view of **Zarsky**. Bikson, ¶228. POSITAs would have been motivated and found it obvious to modify **Simon** in view of **Zarsky's** teachings of an RF circuit in view of **Edoute's** teachings that combined treatment is beneficial. Bikson, ¶¶228.

Simon discloses its device may "measure impedance" such that the "power

of the stimulating coil may be modulated" when impedance changes are detected. Simon, [0185]-[0186], [0195]. As discussed in §VIII.A.3, a POSITA would have been motivated to apply **Edoute's** radiofrequency teachings to **Simon,** utilizing **Zarsky's** teachings of an RF circuit. A POSITA would have understood that a transmatch would be used to conduct "impedance" matching, and a balun transformer would be used to convert unbalanced impedance to balanced impedance, such that treatment parameters based on "tissue impedance" may be modified. Bikson, ¶229. **Zarsky** discloses providing energy from "HF [high-frequency] generator" to a "Transmatch 12" for impedance matching to a target body structure, such as skin, and a "Balun Transformer 13," which "converts unbalanced impedance to balanced impedance," as depicted below in Fig. 1:

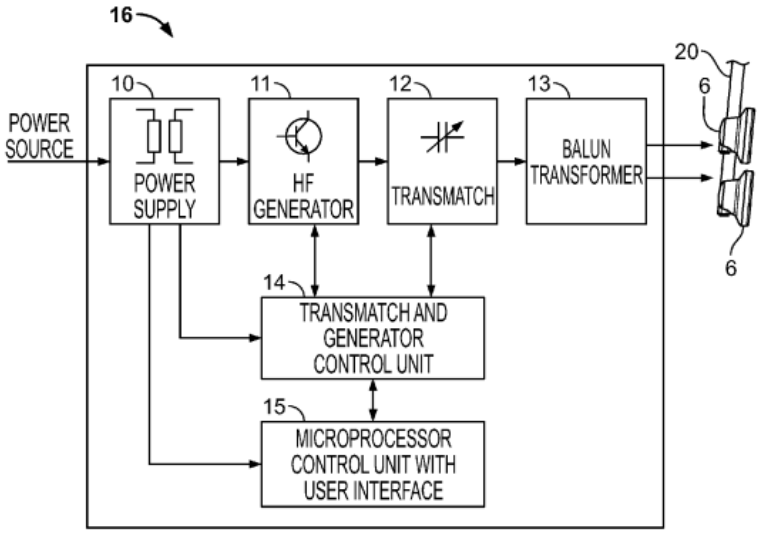


FIG. 1

Zarsky, [0019]-[0021], Fig. 1; *see also* '187, Fig. 6 (identical disclosure to Zarsky

Fig. 1). Bikson, ¶229.

Because **Edoute** leaves the implementation details of a radiofrequency circuit to a POSITA, a POSITA would have been motivated to modify **Simon's** treatment device with the teachings of **Zarsky's** known transmatch in a radiofrequency circuit. It was well-known to use a transmatch for impedance matching (*e.g.*, Zarsky, Fig. 6, [0019]-[0021]) and a POSITA would have been motivated to provide the radiofrequency signal of **Simon's** device modified using **Edoute's** teachings to a transmatch in order to adjust an impedance of a radiofrequency electrode to correspond with an impedance of the biological structure of the patient as **Simon** discloses measuring "impedance," *e.g.*, when determining whether to adjust power. Simon, [0195]. A POSITA would have had a reasonable expectation of success in applying **Zarsky's** teachings of a transmatch to **Simon's** system, allowing **Simon's** device to match impedance of the radiofrequency electrode to the patient's biological structure/skin as **Simon** already discloses measuring impedance. *Id.* Bikson, ¶230.

Moreover, because **Edoute** leaves the implementation details of a radiofrequency circuit to a POSITA, a POSITA would have been motivated to modify **Simon's** device with the teachings of **Zarsky's** balun transformer in a radiofrequency circuit. It was well-known to use a balun transformer to convert an unbalanced radiofrequency signal to a balanced signal. *E.g.*, Choi, [0072] ("[a]

variety of types of baluns are well-known in the art…"); [0094] ("balun may be required" to convert "balanced" to "unbalanced" signals in "RF" device). For example, figure 1 of **Zarsky** shows that the "HF Generator 11," which provides energy at "13.56 or 40.68 or 27.12 MHz, or 2.45 GHz," is connected to "Balun Transformer 13," which "converts unbalanced impedance to balanced impedance." Zarsky, [0019], [0021]. A POSITA would have been motivated to provide energy in **Simon's** system to a balun transformer in order to convert an unbalanced to a balanced radiofrequency signal such that it may be supplied to a transmatch for impedance matching purposes, and would have had a reasonable expectation of success in doing so. Choi, [0072], [0094], [0099], Bikson, ¶231.

Zarsky is in the same field of endeavor as **Simon, Edoute,** and the '187 (*see* §VIII.A.3): electromagnetic stimulation of a patient's body. Zarsky, *Abstract*, [0019]. Thus, **Zarsky** is also analogous art to the '187. **Zarsky** discloses applying radiofrequency via electrodes to a target body region, and discloses a schematic diagram for generating RF energy, including power source, power supply, high frequency generator, transmatch, and balun transformer to provide RF energy to the electrodes. Zarsky, [0019]–[0021], [0024]. A POSITA would have recognized **Zarsky** provides additional circuitry details for radiofrequency stimulation, so applying those teachings into **Simon's** muscle/tissue stimulation device modified by **Edoute's** RF teachings would have been straightforward and predictably

worked. Bikson, ¶232.

POSITAs would have found it routine, straightforward and advantageous to modify **Simon's** device to apply **Edoute's** RF teachings (*see* §VIII.A.3) and **Zarsky**'**s** RF-circuit teachings of a transmatch and balun transformer in its design in view of **Simon's** disclosure of measuring impedance, and would have known such a combination (yielding the claimed limitations) would predictably work and provide the expected functionality. *See KSR Intern. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1731 (2007). Bikson, ¶233.

D. Grounds 4-6: Claims 1, 19, 22-29 are rendered obvious by Simon in view of Edoute and Park, Claims 20-21 are in further view of Ishikawa, and Claim 30 is in further view of Zarsky

1. Park Overview

Park discloses a "wearable energy delivery system" that applies a combination of pulsed electromagnetic field and heat energy for "firming and toning of skin and muscles, and enhanced athletic performance" as shown in Figure 8. Park, *Abstract*, [0004], [0007], [0022], [0027].

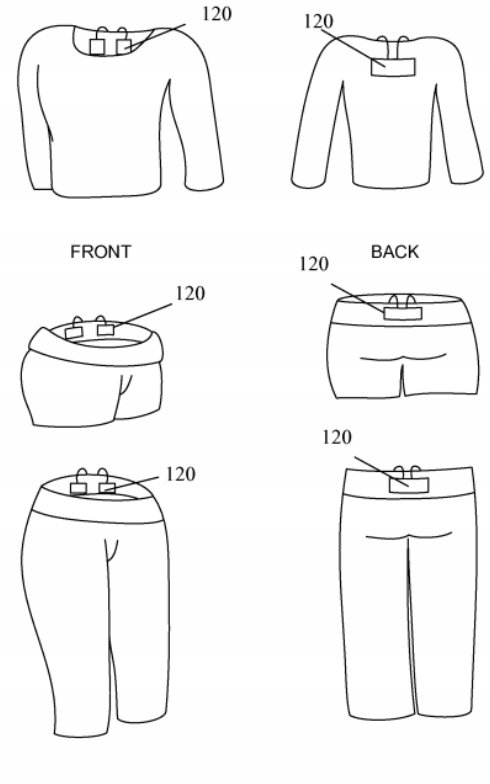


Fig. 8

Park discloses its device that is integrated with an article of clothing delivers a combination of energy such as pulsed electromagnetic field and radio frequency. Park, [0029]. The combination of different energies are beneficial in many ways, including "firming and tightening of skin and muscles, especially in the gluteal, abdominal, and pectoral muscles," and "energizing muscles." Park, [0030]. For example, pulsed electromagnetic field provides "long-term" and "deeper therapeutic effects" for muscle stimulation; and heat energy, such as radiofrequency, provides "soothing effect to skin and short-term relief." Park, [0034]–[0036]. Bikson, ¶¶234-235.

Figures 5A–D (color-annotated) illustrates different configurations of **Park**'s combination device 110 applying magnetic fields through **coils 112** and a heat energy source (*e.g.*, RF) via **electrodes 114**. Park, [0061]–[0065]. Bikson, ¶236.

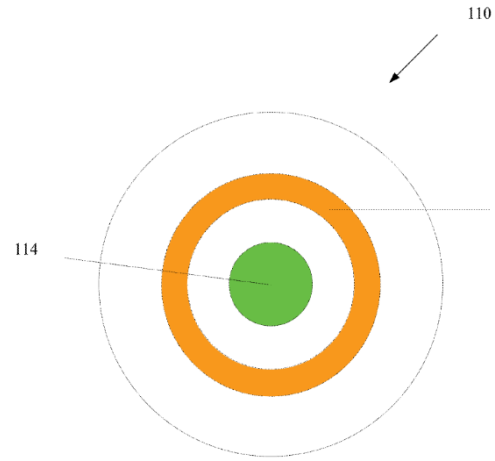


Fig. 5A

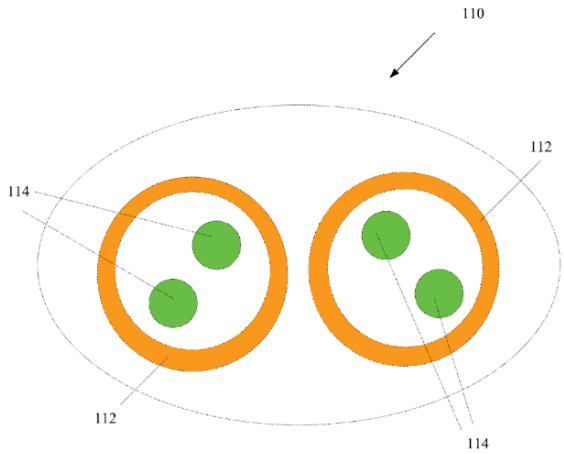


Fig. 5B

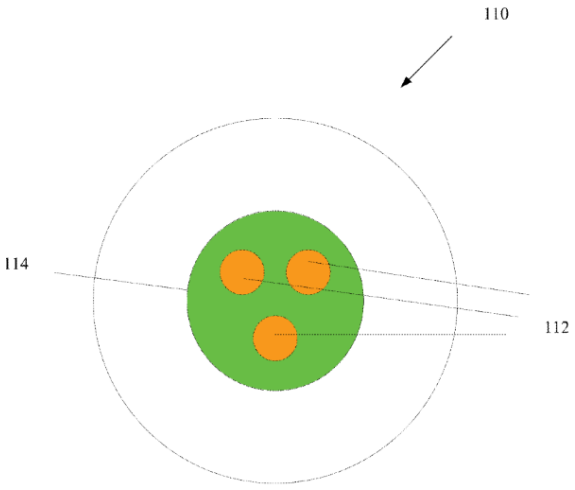


Fig. 5C

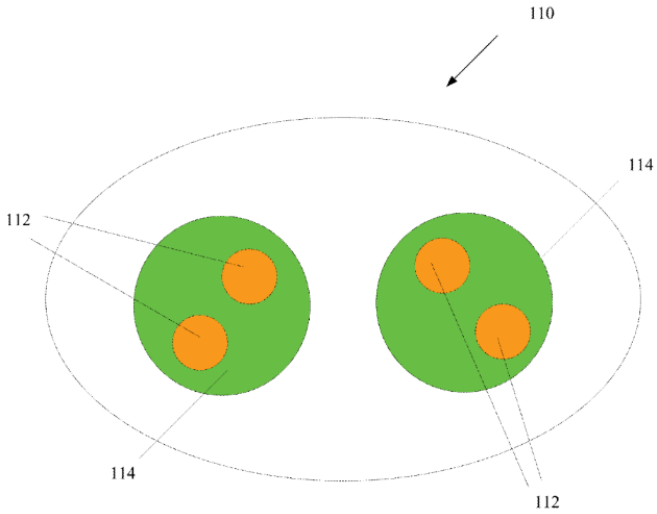


Fig. 5D

2. Discussion

Claims 1-30 are rendered obvious by **Simon** in view of **Edoute** (claims 1, 19, 22-29—*see* §§VIII.A), or in further view of Ishikawa (claims 20-21—*see* §VIII.B), or in further view of Zarsky (claim 30—*see* §VIII.C), for the reasons discussed above. POSITAs would further have been motivated and found it obvious to modify **Simon** in view of **Edoute's** and **Zarsky's** radiofrequency teachings in further view of **Park's** teachings that the combined RF-and-magnetic treatment is beneficial. Bikson, ¶237.

Park discloses that the combined treatment of pulsed electromagnetic field and heat energy (including RF) provides a complimentary effect when firming/toning skin and muscle; magnetic field provides long-term and deeper therapeutic effects on muscle stimulation, and heat energy (such as RF) providing short-term relief on muscle and a soothing effect on skin. Park, *Abstract*, [0027], [0030], [0034]-[0036]. In light of these known benefits of POSITAs would have been motivated and found it obvious to apply **Park**'s teaching of a combination treatment with RF to improve the therapeutic and soothing effect of **Simon's** device on tissue/muscle, and further looked to **Zarsky** for implementation details of an RF circuit and electrodes. Bikson, ¶238.

Park is in the same field of endeavor as **Simon, Edoute**, and **Zarsky** — electromagnetic stimulation of a patient's body—and is analogous art to '187.

Park discloses applying electromagnetic stimulation to tissues. Park, [0036]. Bikson, ¶239.

In light of the above, a POSITA would have found it routine, straightforward, and advantageous to modify **Simon's** magnetic stimulation device to apply **Edoute**'s teachings of applying radiofrequency treatment, and additionally, for claim 30, using **Zarsky**'s RF circuit, in view of the complimentary effects of the combined magnetic field and RF treatment explained by **Park**, and would have known such a combination yielding the claimed limitations would predictably work and provide the expected functionality. Bikson, ¶240; *see also KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 401-02 (2007).

E. Ground 7: Claims 1, 19-30 are rendered obvious by Burnett-'870 in view of Park and Zarsky

1. Burnett-'870 Overview

Burnett-'870 discloses applying time-varying magnetic fields sufficient to "cause contraction of muscle fibers," thereby "toning" muscles. Burnett-'870, *Title, Abstract,* [0003], [0011], [0227]. **Burnett-'870**'s device has multiple applicators comprising coils to generate magnetic fields on a patient's target muscles, as shown in Figure 9B where "coils 106" are disposed in an "abdominal garment" covering the patient's abdomen/buttocks. Burnett-'870, *Abstract*, [0070], [0114]. Bikson, ¶¶241-242.

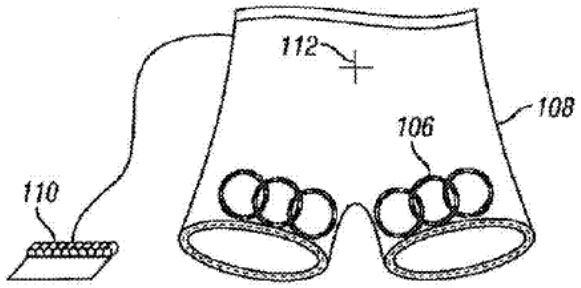


FIG. 9B

Burnett-'870 discloses cooling the coil by direct contact with liquid coolant. Burnett-'870, [0210], [0215], [0235], Fig. 35. Bikson, ¶243.

Burnett-'870 uses a "logic controller" to power the coils and to adjust the parameters of the magnetic fields, based on feedback from a sensor or the patient. Burnett-'870, *Abstract,* [0070], [0018]–[0082], [0134], [0196]. The parameters include, *e.g.*, the magnetic field's "amplitude" and "frequency of stimulation." Burnett-'870, [0070], [0085], [0087], [0117], [0129]. **Burnett-'870** discloses it was known to include a "capacitor" in the device, and uses a "switch" to control energy charging/discharging among components including the controller and the applicators. Burnett-'870, [0013]–[0014], [0085], [0111]. **Burnett-'870** leaves the powering of coils to a POSITA. Burnett-'870, [0130]. Bikson, ¶244.

Burnett-'870 discloses that its device may deliver "high frequencies" and "ultrahigh frequencies" which would encompass radiofrequency. Burnett-'870, [0117]. It explicitly states that its device may apply stimulations such as a "RF

field" Burnett-'870, [0133]. Burnett-'870 further discloses an embodiment of its device comprising **conductive coils 212** and "microneedle patch **228… having one or more electrodes** 232" as illustrated in Fig. 12. Burnett-'870, [0135]; *id.*,[0075], [0116] ("a transcutaneous stimulator, such as an electrode 126"), [0139]-[0140], [0150], [0157]-[0160], Figs. 22-23; *see also id.*, [0002] (incorporating by reference **Burnett-'325** disclosing "radio frequency-powered microstimulators that include electrodes" were known (Burnett-'325, [0022])). Bikson, ¶245.

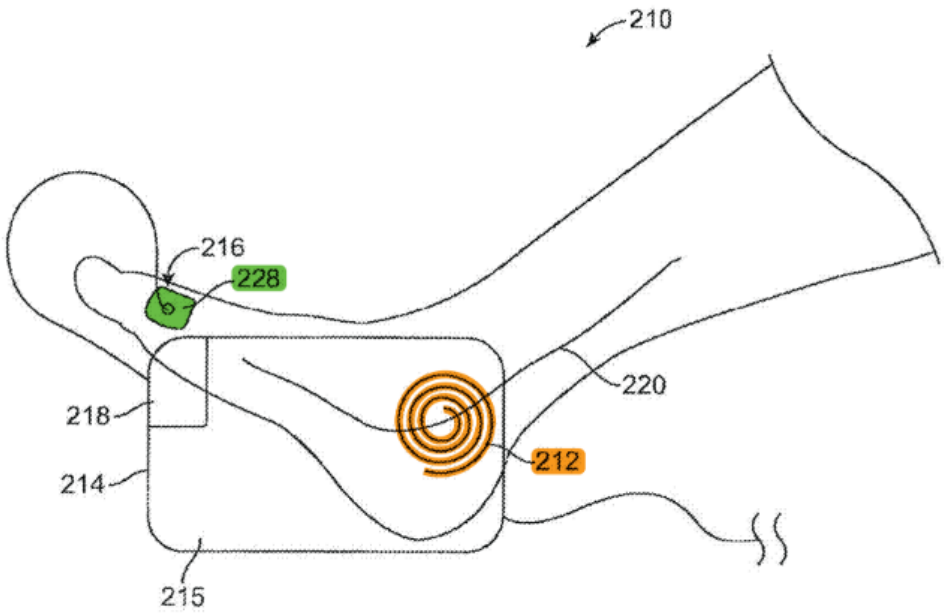


FIG. 12

To the extent argued **Burnett-'870** lacks particular disclosure of a radiofrequency electrode and circuit configured to apply radiofrequency waves for heating tissues, a POSITA would have found it obvious to modify **Burnett-'870**'s

device to do so for the reasons discussed below in §VIII.E.2—*e.g.*, it was well-known and conventional that RF-and-magnetic treatments provided a complementary effect for firming and toning skin and muscle. Park, [0029]-[0030], [0034]-[0036]. Such modification would predictably work and provide the expected functionality given that **Burnett-'870** already discloses a device with coils and electrodes to provide tissue treatment, and applying stimulation using radiofrequency. Bikson, ¶246.

2. Motivation to Combine

Burnett-'870 discloses a device applying magnetic field to stimulate muscles. Burnett-'870, *Abstract*. **Burnett-'870** further discloses applying radiofrequency treatment to tissues and using a device with coils and electrodes for simultaneous application. Burnett-'870, [0117], [0133], [0135]. To the extent argued that **Burnett-'870** does not explicitly disclose a combination device that applies magnetic field and radiofrequency to a target body region, POSITAs would have been motivated and found it obvious to modify **Burnett-'870**'s in view of **Zarsky**'s teachings of an RF circuit and electrodes in view of **Park**'s teachings that the combined treatment is beneficial. Bikson, ¶247.

Park discloses that the combined treatment of pulsed electromagnetic field and heat energy (which includes RF) is advantageous for firming and toning skin and muscle especially in buttocks and abdomen. Park, *Abstract*, [0027], [0030].

The two energies are complimentary with magnetic field providing long-term and deeper therapeutic effects on muscle stimulation, and heat energy (such as RF) providing short-term relief on muscle and a soothing effect on skin. Park, [0034]–[0036]. Because **Burnett-'870** shares the same objective for muscle toning and skin treatment (*e.g., Abstract*, [0011], [0133], [0148]) and its device is also integrated in an article of clothing (such as "abdominal garment") similar to **Park's** wearable, POSITAs would have been motivated and found it obvious to apply **Park**'s teaching of a combination treatment with RF to improve the therapeutic and soothing effect of **Burnett-'870**'s device on skin and muscle, and further look to **Zarsky** for implementation details of an RF circuit and electrodes. Furthermore, such improvement would merely be combining known techniques for known benefits as the '187 recognizes that "radiofrequency treatment" is one of "the most common methods used for non-invasive aesthetic applications" and its effect was known to be "based specifically on heat production in the biological structure." '187, 1:39–47. Bikson, ¶248.

Similar to **Burnett-'870** and **Park, Zarsky** is also directed to applying electromagnetic energy for tightening skin and tissue. Zarsky, *Abstract*, [0019]. **Zarsky** discloses applying radiofrequency via electrodes to a target body region, and discloses a schematic diagram for generating RF energy, including power, source, power supply, high frequency generator, transmatch, and a balun

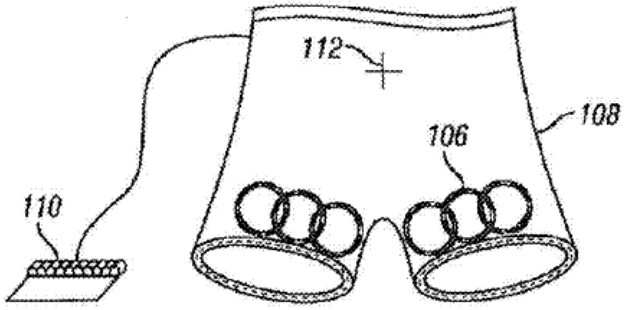
transformer to provide RF energy to the electrodes. Zarsky, [0019]–[0021], [0024]. POSITAs would have found it routine, straightforward and advantageous to modify **Burnett-'870**'s device to apply **Zarsky**'s teachings of an RF circuit and electrodes in its design in view of the complimentary effects of the combined magnetic field and RF treatment explained by **Park**, and would have known such a combination (yielding the claimed limitations) would predictably work and provide the expected functionality. *See KSR Intern. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1731 (2007). Bikson, ¶249.

Burnett-'870, **Park**, and **Zarsky** are in the same field of endeavor—electromagnetic stimulation of a patient's body—and are analogous art to '187. **Burnett-'870** and **Park** disclose applying magnetic field and RF waves to stimulate tissues. Burnett-'870, *Abstract*; Park, [0036]. **Zarsky** discloses applying electromagnetic energy such as RF to tighten skin and heat targeted body area. Zarsky, *Abstract*, [0019]. Bikson, ¶250.

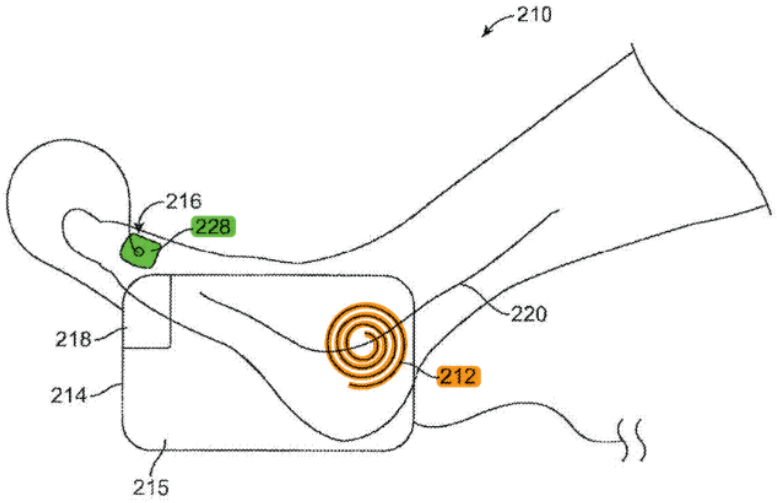
3. Claim Charts

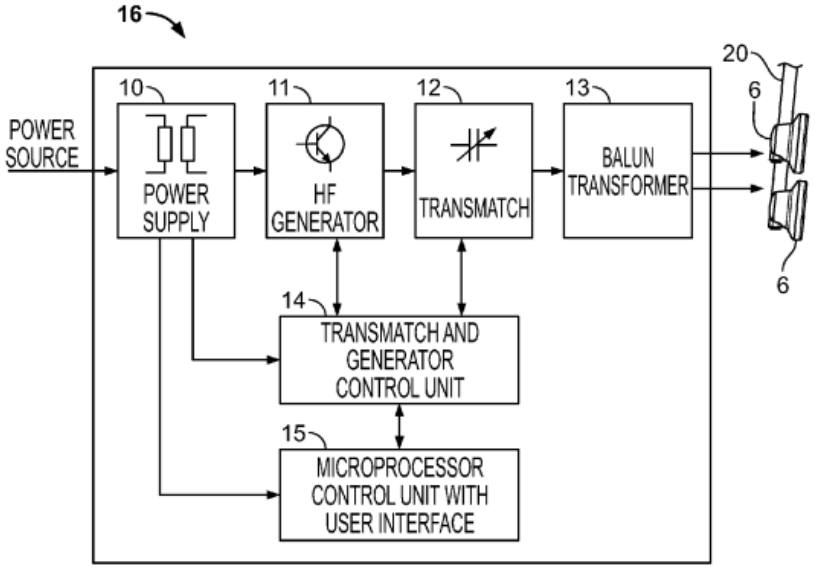
a. Independent Claims 1 and 19

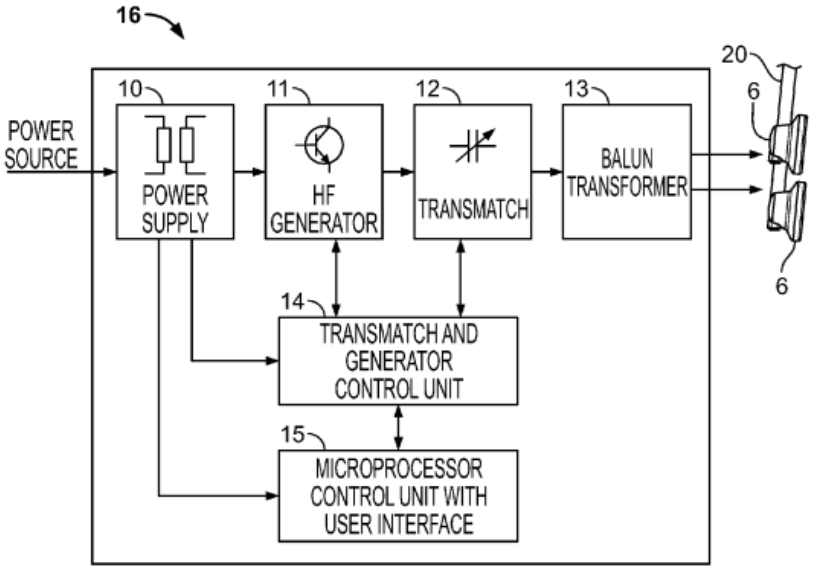
Claim Elements	Burnett-'870 in view of Park and Zarsky
[1.pre] A method of treatment of a target biological structure of a patient using a treatment device which includes a	**Burnett-'870 teaches a method of treatment** (*e.g.*, "toning") **of a target biological structure** (*e.g.*, "muscle") **of a patient using a treatment device** (*e.g.*, "system[]…for electromagnetic induction therapy") **which includes a connection to an energy source** (*e.g.*, "power source")**, a high-frequency generator** (*e.g.*, "energy generator")**, a radiofrequency electrode** (*e.g.*, an "electrode" applying "a

Claim Elements	Burnett-'870 in view of Park and Zarsky
connection to an energy source, a high-frequency generator, a radiofrequency electrode, an energy storage device electrically connected to a switching device and a magnetic field generating device, comprising:	RF field"), **an energy storage device** (*e.g.*, "capacitor") **electrically connected to a switching device** (*e.g.,* "switch") **and a magnetic field generating device** (*e.g.*, "applicator" comprising "coils")**.** **Burnett-'870** discloses "systems and[] methods for electromagnetic induction therapy" of a "patient" using "body contoured applicators" including "coils configured to generate an electromagnetic or magnetic field focused on a target nerve, muscle or other body tissues"; "toning tissue with focused, coherent EMF [electromagnetic field]"; and "causing muscles to contract." Burnett-'870, *Abstract*, [0006], [0011], [0225]–[0226]. **Burnett-'870** discloses the magnetic fields are "time varying" and "pulsed." Burnett-'870, [0003]. Figure 9B illustrates two applicators, each with a set of coils 106, disposed within an "abdominal garment" covering and treating left and right sides of a patient's buttocks/abdomen. Burnett-'870, [0114].  FIG. 9B **Burnett-'870** discloses its device includes a "power source" that is connected to a "logic controller." Burnett-'870, [0130], [0081], [0084], [0097] ("logic controller…manages the flow of electric power to coils…"). **Burnett-'870** further discloses it was known to use capacitors as energy storage devices in a magnetic stimulator. Burnett-'870, [0013]–[0014]. Indeed, its provisional application discloses using in its invention a LoFIT system described in Burnett-'185. Burnett-Provisional-'720, [0001]–[0002], [0020]. Burnett-'185 discloses incorporating a capacitor in the circuitry of the

Claim Elements	Burnett-'870 in view of Park and Zarsky
	device, allowing it to be charged, and using a switch to discharge it to the coil. Burnett-'185, 6:66–7:2, 7:27–8:26. **Burnett-'870** also discloses using a "switch" to control stimulation. Burnett-'870, [0085], [0111] (disclosing "direct switching of the current circuit" between logic controller and sensor). Because a capacitor stores energy to be discharged, and a coil uses energy to generate a magnetic field, POSITAs would have understood that the capacitor is charged by an energy source, such that the energy is discharged, via a "switch" to the coil to generate the magnetic field, as was known in the art. *See, e.g.,* Magstim, 3–4, Fig. 2 ("a transformer charges a capacitor…and the capacitor is then connected to the coil via an electronic switch when the user wishes to apply the stimulus"). **Burnett-'870** discloses an "energy generator to produce, generate or deliver energy, *e.g.,* a magnetic or electromagnetic field." Burnett-'870, [0175], [0069]. **Burnett-'870** discloses that its device may deliver "high frequencies" and "ultrahigh frequencies." Burnett-'870, [0117]. A POSITA would have understood that such energy generator is high frequency because **Burnett-'870** discloses applying stimulation such as "a RF field," which is known to be high/ultrahigh frequency. Burnett-'870, [0133]; '187, 15:39–46 ("HF…generator" provides "energy for radiofrequency treatment"). **Burnett-'870** further discloses an embodiment of its device comprising **conductive coils 212** and "microneedle patch **228… having one or more electrodes** 232" in Fig. 12.

Claim Elements	Burnett-'870 in view of Park and Zarsky
	 FIG. 12 Burnett-'870, [0135]; *id.*, [0075], [0116], [0139]–[0140], [0150], [0157]–[0160], Figs. 22-23. **Burnett-'870** incorporates by reference ([0002]) Burnett-'325 disclosing that "radio frequency-powered microstimulators that include electrodes" were known. Burnett-'325, [0022]. To the extent argued **Burnett-'870** does not explicitly discloses a "high-frequency generator," **Zarsky** discloses a "HF Generator (high frequency generator) 11." Zarsky, [0019]. To the extent argued **Burnett-'870** does not explicitly discloses "a radiofrequency electrode," **Zarsky** further discloses "electrodes 6" that apply "radio frequency." Zarsky, Fig. 1, [0024], [0026], [0014], cls. 1-10. In view of the teachings from **Park** ([0005], [0029], [0036]) for the benefits of combination treatment**,** POSITAs would have been motivated and found it obvious to modify **Burnett-'870**'s device to apply **Zarsky**'s teaching of a "high-frequency generator" and a "radiofrequency electrode" such that both magnetic field and RF are applied simultaneously, which would reduce the total treatment time, and provide synergistic effects compared to separate treatments. *See* §VIII.E.2. Bikson, ¶¶251-255.

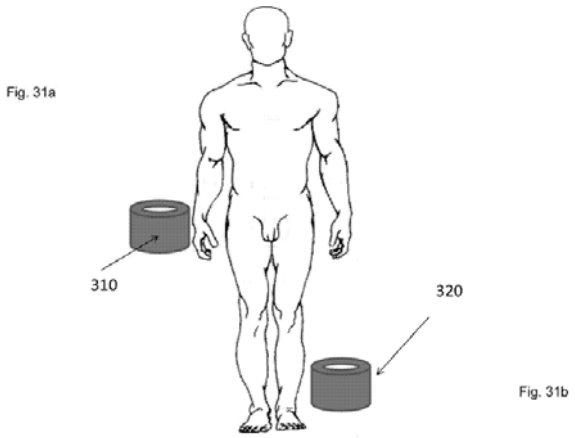
Claim Elements	Burnett-'870 in view of Park and Zarsky
	 FIG. 1
[1.a] a. charging the energy storage device from the energy source;	**Burnett-'870 teaches charging the energy storage device** (*e.g.*, "capacitor") **from the energy source** (*e.g.*, "power source")**.** *See* [1.pre]. Bikson, ¶¶256-257.
[1.b] b. providing energy from the energy storage device to the magnetic field generating device to generate a time-varying magnetic field;	**Burnett-'870 teaches providing energy from the energy storage device** (*e.g.*, "capacitor") **to the magnetic field generating device** (*e.g.*, "applicator" comprising "coils") **to generate a time-varying magnetic field.** *See* [1.pre]–[1.a]. Bikson, ¶¶258-259.
[1.c] c. applying the time-varying magnetic field to the patient;	**Burnett-'870 discloses applying the time-varying magnetic field to the patient.** *See* [1.pre]–[1.b]. Bikson, ¶260-261.
[1.d] d. providing energy from the energy source to the high-	**Burnett-'870 teaches providing energy from the energy source** (*e.g.*, "power source") **to the high-frequency generator** (e.g., "energy generator") **in order to provide the**

Claim Elements	Burnett-'870 in view of Park and Zarsky
frequency generator in order to provide the energy to the radiofrequency electrode;	**energy to the radiofrequency electrode** (*e.g.*, an "electrode" applying "a RF field")**.** *See* [1.pre]—POSITAs would have understood that **Burnett-'870**'s "energy generator" receives power from the "power source" to provide energy to an "electrode" applying "a RF field." To the extent argued this is not explicitly disclosed in **Burnett-'870, Zarsky** explicitly discloses that its "HF Generator 11" is connected to "power supply 10" that is connected to a "power source." Zarsky, [0019]. The "HF Generator 11" provides energy to "electrodes 6" that apply "radio frequency." Zarsky, [0024], [0026], [0014], cls. 1–10. *See* §VIII.E.2. Bikson, ¶¶262-265.  FIG. 1
[1.e] e. generating radiofrequency waves with a frequency of at least 1 MHz by	**Burnett-'870 in view of Park and Zarsky teaches generating radiofrequency waves by the radiofrequency electrode.** *See* [1.pre], [1.d]—**Zarsky** explicitly discloses that its "electrodes 6" apply radio frequency at "13.56 or 40.68 or

Claim Elements	Burnett-'870 in view of Park and Zarsky
the radiofrequency electrode;	27.12 MHz, or 2.45 GHz." Zarsky, [0019], [0026], cls. 10, 34. Bikson, ¶¶266-268.
[1.f] f. applying the radiofrequency waves to the patient; and	**Burnett-'870 in view of Park and Zarsky teaches applying the radiofrequency waves to the patient.** *See* [1.pre], [1.d]–[1.e]—**Zarsky** discloses RF waves are applied to the patient by positioning "electrodes 6" on or above the patient's skin. Zarsky, [0024], [0026], cls. 1 ("heating of the subcutaneous tissue"), 8-9. Bikson, ¶¶269-271.
[1.g] g. heating the target biological structure by the radiofrequency waves;	**Burnett-'870 in view of Park and Zarsky teaches heating** (*e.g.*, "heating" in Zarsky) **the target biological structure** (*e.g.*, "muscle," "subcutaneous tissue" of Zarsky) **by the radiofrequency waves**. *See* [1.pre], [1.d]–[1.f]—**Zarsky** discloses using RF for "controlled heating of the targeted areas on the human body." Zarsky, [0001], [0007], [0018], cl. 1. Bikson, ¶¶272-274.
[1.h] h. wherein the magnetic field has a repetition rate in a range of 1 to 100 Hz;	**Burnett-'870 discloses the magnetic field has a repetition rate in a range of 1 to 100 Hz** (*e.g.*, "about 10 to 20 hertz")**.** *See* [1.pre]–[1.c]—**Burnett-'870** discloses "[o]peration of a conductive coil at about 10 to 20 hertz" and "about 5 to 100 hertz." Burnett-'870, [0195]. Bikson, ¶¶275-277.
[1.i] i. wherein a voltage drop between successive peak amplitudes in the energy storage device is up to 21%.	**Burnett-'870 teaches a voltage drop between successive peak amplitudes in the energy storage device** (*e.g.*, "capacitor") **is up to 21%.** *See* [1.pre]–[1.c], [1.h]—To the extent argued **Burnett-'870** does not explicitly disclose a certain voltage drop up to 21%, POSITAs would have been motivated and found it obvious to operate **Burnett-'870's** device with a constant voltage, or a voltage drop between successive peak amplitudes up to 21%, to minimize the capacitor's charge time in repetitive discharge timing applications, increase repetition rate by recharging the energy storage during a previous pulse, and to still deliver a therapeutic amplitude as desired by the patient, as was well-known and conventional in the art. *See, e.g.*,

Claim Elements	Burnett-'870 in view of Park and Zarsky
	Polson, 3:38–40 ("voltage…on the discharge capacitor is about 80% of its initial magnitude"); 1:37–54 (describing "replenish[ing] the charge" on a discharge capacitor such that "rate of discharge pulses" is increased); '187, 6:66–7:3 (similarly to Polson, a small voltage drop allows for "increase [in]…repetition rate" because energy storage device is recharged during previous pulse). Bikson, ¶97-99. POSITAs would have been motivated and found it obvious to operate **Burnett-'870** so that a voltage drop between the capacitor's successive peak amplitudes is up to 21%, such that repetition rate may be increased by charging capacitors during the prior pulse, and to minimize any drop in the magnetic field's flux density during patient treatment. Bikson, ¶¶278-280.
[19.pre] A method for treating a biological structure of a patient by a time-varying magnetic field and radiofrequency waves comprising:	**Burnett-'870 in view of Park and Zarsky teaches a method for treating** (*e.g.*, "toning") **a target biological structure** (*e.g.*, "muscle") **of a patient by a time-varying magnetic field and radiofrequency waves.** *See* [1.pre]-[1.g]. Bikson, ¶¶281-282.
[19.a] a. providing energy from an energy source to an energy storage device and/or to a high-frequency generator;	**Burnett-'870 in view of Park and Zarsky teaches providing energy from an energy source** (*e.g.*, "power source") **to an energy storage device** (*e.g.*, "capacitor") **and/or to a high-frequency generator** (*e.g.*, "energy generator")**.** *See* [1.pre]–[1.b], [1.d]. Bikson, ¶¶283-284.
[19.b] b. providing energy from the energy storage device to a	**Burnett-'870 teaches providing energy from the energy storage device** (*e.g.*, "capacitor") **to a magnetic field generating device** (*e.g.*, "applicator" comprising "coils") **in order to generate the time-varying magnetic field with a**

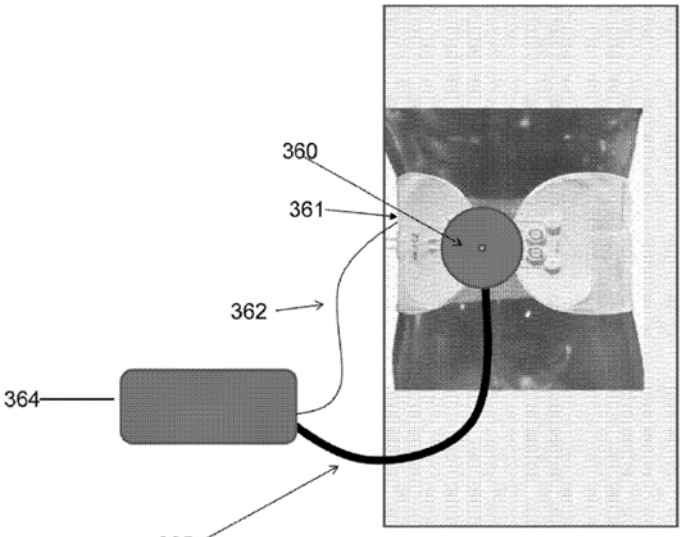
Claim Elements	Burnett-'870 in view of Park and Zarsky
magnetic field generating device in order to generate the time-varying magnetic field with a magnetic flux density in a range of 0.15 to 7 T, a repetition rate in a range of 1 to 700 Hz, and with an impulse duration in a range of 10 to 900 μs;	**magnetic flux density in a range of 0.15 to 7 T** (*e.g.*, "0.25 to 1.5 tesla")**, a repetition rate in a range of 1 to 700 Hz** (*e.g.*, "about 10 to 20 hertz")**, and with an impulse duration in a range of 10 to 900 μs** (*e.g.*, "50 μs")**.** *See* [1.pre]–[1.c], [1.h] **Burnett-'870** discloses "[o]peration of a conductive coil at about 10 to 20 hertz generating a magnetic field of about 0.25 to 1.5 tesla." Burnett-'870, [0195]. **Burnett-'870** incorporates by reference Burnett-'325. Burnett-'870, [0002]. Burnett-'325 discloses that it was known to use a magnetic field having an impulse of "a 50 μs duration." Burnett-'325, [0010]. **Burnett-'870** leaves it to POSITAs to choose an impulse duration, the range of 10 μs to 900 μs was known and conventional. *E.g.,* Magstim, 3 ("a pulse duration from 100-1000μs, dependent on stimulator type"). Bikson, ¶¶285-288.
[19.c] c. providing energy from the high-frequency generator to a radiofrequency electrode in order to generate the radiofrequency waves with a frequency in a range of 1 MHz to 900 GHz;	**Burnett-'870 in view of Park and Zarsky teaches providing energy from the high-frequency generator** (*e.g.*, "energy generator") **to a radiofrequency electrode** (*e.g.*, an "electrode" applying "a RF field") **in order to generate the radiofrequency waves with a frequency in a range of 1 MHz to 900 GHz.** *See* [1.pre], [1.d]–[1.e]. Bikson, ¶¶289-290.
[19.d] d. applying the time-varying magnetic field to at least one body region including thighs, buttocks, abdomen, hips or	**Burnett-'870 teaches applying the time-varying magnetic field to at least one body region including thighs, buttocks, abdomen, hips or arms of the patient in order to cause a muscle contraction and the radiofrequency waves heating the at least one body region of the patient.**

Claim Elements	Burnett-'870 in view of Park and Zarsky
arms of the patient in order to cause a muscle contraction and the radiofrequency waves heating the at least one body region of the patient; and	*See* [1.pre]–[1.g]—**Burnett-'870**'s "body-contoured applicators" apply to arms. Burnett-'870, [0012], Figs. 31-A-B ("arm applicator"). Bikson, ¶¶291-293. 
[19.e] e. using a signal from a sensor measuring a physical quantity including one or more of voltage, current, a phase shift, a magnetic flux density, a temperature, an electric field intensity, a distance or an impedance in order to adjust an output power applied to the patient.	**Burnett-'870 teaches using a signal from a sensor** (*e.g.*, "sensor") **measuring a physical quantity including one or more of voltage, current, a phase shift, a magnetic flux density, a temperature, an electric field intensity, a distance or an impedance in order to adjust an output power applied to the patient.** **Burnett-'870** discloses its device has a "logic controller… connected to the one or more coils" and "sensors" to provide feedback to the controller. The logic controller adjusts "amplitude, frequency or direction of the magnetic field, or the firing sequence" of the coils to provide efficient treatment to tissues. Burnett-'870, [0070]. **Burnett-'870** also discloses the sensor "detect[s] and record[s] the firing of the target nerve and [] provide[s] related information to logic controller [], so to render the intended therapy most effective." Burnett-'870, [0081]. Further, **Burnett-'870** discloses "sensor [] may be configured as a voltage or current detector" (Burnett-'870, [0082]; *see also id.*, [0134]). Bikson, ¶¶294-295.

b. Dependent Claims 20-30

Claim Elements	Burnett-'870 in view of Park and Zarsky
[20] The method of claim 19 wherein the magnetic field generating device includes a conductor diameter less than 3 mm.	**Burnett-'870 teaches the magnetic field generating device** (*e.g.*, "applicator" comprising "coils") **includes a conductor diameter less than 3 mm.** *See* [1.pre]. **Burnett-'870**'s coils, which are conductors, "have a variety of dimensions and configurations"—"The coil body may include any suitable number of turns…The end or cross section of the turn may have a width ranging from about 0.5 mm to about 5 mm… or from about 1 mm to about 2 mm… or about 0.2 mm to about 1.6 mm." Burnett-'870, [0201]. POSITAs would have understood that "cross section" here refers to the claimed conductor diameter. Bikson, ¶¶296-298.
[21] The method of claim 19 wherein the magnetic field generating device includes a litz-wire.	**Burnett-'870 teaches the magnetic field generating device** (*e.g.*, "applicator" comprising "coils") **includes a litz wire.** *See* [1.pre], [20]—**Burnett-'870** leaves it to POSITAs to choose a conductor material for the coils, and using litz wires in coils for generating magnetic fields was known and conventional in the art to prevent high coil resistance causing electrical loss and significant heat generation "leading to danger of burn." *See, e.g.*, Ishikawa, *Abstract*, [0005]-[0006], [0039], [0046] ("the conductor portion 2 including bare wire 1 of the litz wire coil 6"). A POSITA would have been motivated to use litz wire in **Burnett-'870's** coil to prevent "burn," which is a safety concern expressed in **Burnett-'870.** Ishikawa, [0006]; **Burnett-'870**, [0119], [0235]. Bikson, ¶¶299-301.
[22] The method of claim 19 wherein a voltage drop between two successive peak amplitudes output	**Burnett-'870 teaches a voltage drop between two successive peak amplitudes output from the energy storage device** (*e.g.*, "capacitor") **is not higher than 21%.** *See* [1.i]. Bikson, ¶¶302-303.

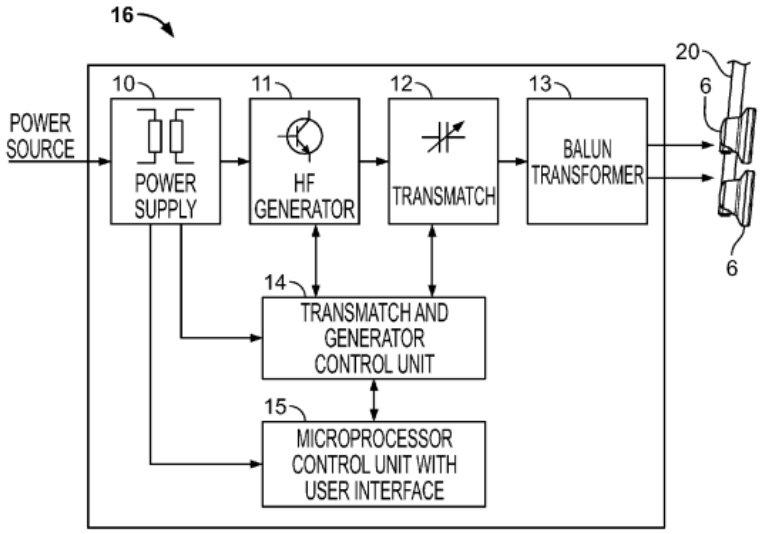
Claim Elements	Burnett-'870 in view of Park and Zarsky
from the energy storage device is not higher than 21%.	
[23] The method of claim 19 wherein the energy storage device is in a serial connection with the magnetic field generating device.	**Burnett-'870 teaches the energy storage device** (*e.g.*, "capacitor") **is in a serial connection with the magnetic field generating device** (*e.g.*, "applicator" comprising "coils")**.** **Burnett-'870** leaves it to POSITAs to choose an arrangement of a capacitor and coil, it was known and conventional in the art that they are connected "in series or in parallel" depending on circuit design and application. *See, e.g.*, Simon, [0019], [0055] ("coils, each of which is connected in series or in parallel to the impulse generator" that contains a capacitor). POSITAs would have been motivated and found it obvious to serially-connect the capacitor the coil in order to have constant current through the circuit. Bikson, ¶¶304-305.
[24] The method of claim 19 further comprising directing a cooling media in a direction parallel to the magnetic field generating device.	**Burnett-'870 teaches directing a cooling media in a direction parallel to the magnetic field generating device** (*e.g.*, "applicator" comprising "coils")**.** **Burnett-'870** discloses a conduit through "coil power line 365" to direct "fluid" such as "air" or "liquid," "rapid[ly]" to coils positioned in "applicator 360," and "[d]rawing air or other fluid through the coil" in Figure 35. Burnett-'870, [0010], [0210], [0215], [0235].

Claim Elements	Burnett-'870 in view of Park and Zarsky
	 Fig. 35 POSITAs would have understood **Burnett-'870** directs a cooling fluid in a direction parallel to the coils because the fluid line goes alongside with and into the coils such that the cooling fluid flows through the coils to maximize surface area and time contacting the coils to efficiently dissipate heat. *See*, '187, Fig. 2 (fluid flows alongside the coils as indicated by the arrows). Bikson, ¶¶306-308, 86-90.
[25] The method of claim 19 further comprising directing a cooling media by a blower on a circumference of the magnetic field generating device.	**Burnett-'870 teaches directing an air cooling media** (*e.g.*, "air," "liquid") **on a circumference of the magnetic field generating device** (*e.g.*, "applicator" comprising "coils")**.** *See* [24]—**Burnett-'870** discloses "air" cooling technique, such as "rapid airflow to cool the coils," which would encompass the coil circumference. Burnett-'870, [0210], [0215]. **Burnett-'870** leaves it to POSITAs to choose the mechanism to move coolant air, and the use of an air blower to move air is well known and conventional in a magnetic field generation device. *See, e.g.*, Ghiron, 1:57-60 ("Conventional cooling solutions typically involve the use of …air cooling mechanism [that] may involve a fan that rapidly circulates cooled or room temperature air past the magnetic device."). POSITAs would have been motivated and found it obvious to use an air blower in **Burnett-'870**'s device to

Claim Elements	Burnett-'870 in view of Park and Zarsky
	generate a "rapid airflow" through the coils. Bikson, ¶¶309-311.
[26] The method of claim 19 further comprising operating a treatment device including the magnetic field generating device to maintain a temperature of a casing of the magnetic field generating device up to 43° C.	**Burnett-'870 teaches operating a treatment device including the magnetic field generating device** (*e.g.*, "applicator" comprising "coils") **to maintain a temperature of a casing** (*e.g.*, "housing") **of the magnetic field generating device up to 43° C.** *See* [1.pre], [24]–[25]. **Burnett-'870** discloses "one or more conductive coils disposed in an ergonomic housing," *e.g.*, "wrap"/"cradle"/"garment." Burnett-'870, [0070], [0074]. **Burnett-'870** discloses cooling techniques to avoid "exposing the patient to excessive temperatures" of its "cradle device." Burnett-'870, [0235], [0196], [0208] ("overheating"). **Burnett-'870** leaves it to POSITAs to choose a temperature to maintain the casing of its device that would not be "excessive" or cause "overheating" and POSITAs would have been motivated and found it obvious to maintain the housing temperature at less than 43°C for safety, compliance with FDA guidelines, and patient comfort. *See, e.g.,* Ghiron, 1:22-33 ("the temperature of a magnetic stimulation device used to generate a therapeutic magnetic field should be kept below approximately 41.5° C. to stay within certain regulatory requirements (e.g., FDA guidelines)."). Bikson, ¶¶312-314.
[27] The method of claim 19 wherein the sensor is in a treatment device including the magnetic field generating device and/or the radiofrequency electrode.	**Burnett-'870 discloses that the sensor** (*e.g.*, "sensor") **is in a treatment device including the magnetic field generating device** (*e.g.*, "applicator" comprising "coils") **and/or the radiofrequency electrode** (*e.g.*, an "electrode" applying "a RF field")**.** *See* [1.pre], [19.e]—**Burnett-'870** discloses "the sensors may be incorporated within the housing" of its magnetic generating device. Burnett-'870, [0071], [0074]. Bikson, ¶¶316-318.

Claim Elements	Burnett-'870 in view of Park and Zarsky
[28] The method of claim 19 further comprising causing a repeated muscle contraction.	**Burnett-'870 discloses causing a repeated muscle contraction.** *See* [1.pre]-[1.c], [1.h], [19.b], [19.d] **Burnett-'870** discloses that the magnetic fields are "time varying," "pulsed," and "intermittently applied"; the coils operate at a frequency; and target regions are "exposed to the *impulses*" of the magnetic fields—indicating that the fields generate consecutive impulses. Burnett-'870, *Abstract*, [0003], [0195], [0226]. **Burnett-'870**'s device provides "maximal stimulation (i.e., sufficient to cause contraction of muscle fibers and firing of nerves)." Burnett-'870, [0227], [0006], [0108]. POSITAs would have understood that application of the magnetic field generating consecutive impulses results in "repeated stimulation" causing the muscle to contract repeatedly during a treatment. Burnett-'870, [0088], [0100], [0117], [0132]. Bikson, ¶¶319-321, 91-96.
[29] The method of claim 19 further comprising applying the radiofrequency waves with energy up to 400 W.	**Burnett-'870 teaches applying radiofrequency waves.** *See* [1.pre], [1.d]-[1.h]. To the extent argued **Burnett-'870** does not explicitly disclose a specific RF energy, **Zarsky** discloses "applying the radio frequency electromagnetic waves with a power range is 30-400 W per pulse." Zarsky, cl. 4, [0015], [0027]. POSITAs would have been motivated and found it obvious to apply RF waves with energy of "30-400 W" as taught by Zarsky to provide effective "remodeling and downsizing subcutaneous lipid-rich cells, body contouring and skin tightening," which is also the objective in **Burnett-'870** to provide skin treatment. Zarsky, [0001]; Burnett-'870, [0043], [0118]-[0119], [0133], [0148]. *See* §VIII.E.2. Bikson, ¶¶322-324, 72-75.
[30] The method of claim 19 further comprising providing energy	**Burnett-'870 teaches providing energy from the high-frequency generator** (*e.g.*, "energy generator") **to a radiofrequency electrode** (*e.g.*, an electrode applying "a RF field")**.**

Claim Elements	Burnett-'870 in view of Park and Zarsky
from the high-frequency generator to a balun transformer in order to convert an unbalanced radiofrequency signal to a balanced radiofrequency signal and providing the balanced radiofrequency signal to a transmatch in order to adjust an impedance of a radiofrequency electrode to correspond with an impedance of the biological structure of the patient.	**Burnett-'870** leaves it to POSITAs to determine the components for generating RF waves. To the extent argued **Burnett-'870** does not disclose a balun transformer and a transmatch, **Zarsky discloses providing energy from the high-frequency generator** (*e.g.*, "HF Generator 11") **to a balun transformer** (*e.g.*, "Balun Transformer 13") **in order to convert an unbalanced radiofrequency signal to a balanced radiofrequency signal and providing the balanced radiofrequency signal to a transmatch** (*e.g.*, "Transmatch 12") **in order to adjust an impedance of a radiofrequency electrode to correspond with an impedance of the biological structure of the patient.** *See* [1.pre], [1.d]-[1.g]. Figure 1 of **Zarsky** shows that the "HF Generator 11," which provides energy at "13.56 or 40.68 or 27.12 MHz, or 2.45 GHz," is connected to "Balun Transformer 13," which "converts unbalanced impedance to balanced impedance." Zarsky, [0019], [0021]. Figure 1 further shows that the a "Transmatch 12" is connected to the "Balun Transformer 13" and "generator control unit 14" for impedance matching to a target body structure, such as skin. Zarsky, [0019]-[0021]; *see also* '187, Fig. 6 (identical disclosure to Zarsky Fig. 1). Bikson, ¶¶325-329, 100-101.

Claim Elements	Burnett-'870 in view of Park and Zarsky
	 FIG. 1

IX. SECONDARY CONSIDERATIONS

Petitioner is unaware of evidence of secondary considerations relevant to the Challenged Claims at the date of this filing. Bikson, ¶331.

X. CONCLUSION

Petitioner respectfully requests IPR of Claims 1, 19-30 of the '187. Bikson, ¶¶332-334.

Dated: September 13, 2021

Respectfully submitted,

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Lead Counsel for Petitioner

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. §42.24(a) and (d), the undersigned hereby certify that the Petition For *Inter Partes* Review complies with the type-volume limitation of 37 C.F.R. §42.24(a)(i) because, exclusive of the exempted portions, it contains 13,343 words as counted by the word processing program used to prepare the paper.

Dated: September 13, 2021

/Keyna Chow/
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CERTIFICATE OF SERVICE

The undersigned certifies service pursuant to 37 C.F.R. §§42.6(e) and 42.105(b) on the Patent Owner by FedEx of a copy of this Petition for Inter Partes Review and supporting materials at the correspondence address of record for the '187 patent:

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