



US00D766597S

(12) **United States Design Patent** (10) **Patent No.:** **US D766,597 S**  
**Vissman et al.** (45) **Date of Patent:** **\*\* Sep. 20, 2016**

(54) **APPAREL WITH BIO-CERAMIC SURFACE ORNAMENTATION**  
(71) Applicant: **Multiple Energy Technologies LLC**, Washington, PA (US)  
(72) Inventors: **Shannon Vissman**, Upper St. Clair, PA (US); **Francisco Jose Cidral-Filho**, Florianopolis (BR); **Steven Midttun**, Boca Raton, FL (US)  
(73) Assignee: **MULTIPLE ENERGIES TECHNOLOGIES LLC**, Washington, PA (US)

(\*\*) Term: **14 Years**

(21) Appl. No.: **29/495,157**  
(22) Filed: **Jun. 27, 2014**  
(51) **LOC (10) Cl.** ..... **05-02**  
(52) **U.S. Cl.**  
USPC ..... **D5/30; D24/209**  
(58) **Field of Classification Search**  
USPC ..... D24/107, 186, 200, 209, 210; D5/4, 30, D5/59; D20/12, 22  
CPC ..... A61N 5/0616  
See application file for complete search history.

(56) **References Cited**  
**U.S. PATENT DOCUMENTS**  
5,208,089 A \* 5/1993 Norris ..... C11D 17/047  
427/242  
5,258,228 A 11/1993 Komuro  
5,645,934 A 7/1997 Ducheyne  
D405,885 S \* 2/1999 Pinter ..... D24/200  
5,894,067 A \* 4/1999 Kim ..... A61N 5/0613  
252/301.36

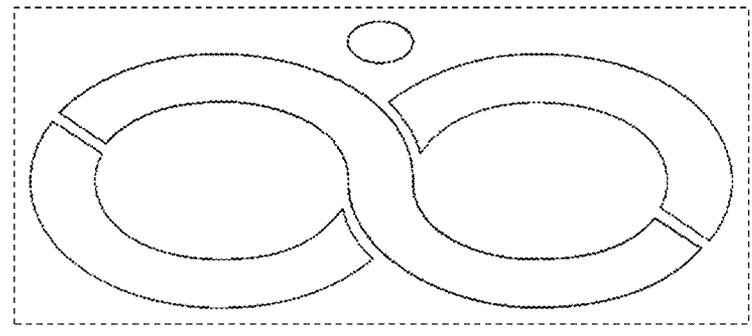
(Continued)  
**FOREIGN PATENT DOCUMENTS**  
BR PI0801804-9 2/2009  
BR PI0805782-6 8/2010  
(Continued)

**OTHER PUBLICATIONS**  
Koo et al. 2009. The application of PCMMs and Sic by commercially direct dual-complex coating on textile polymer. Applied Surface Science 255:8313-8318.  
(Continued)  
*Primary Examiner* — Anhdao Doan  
(74) *Attorney, Agent, or Firm* — Wilson Sonsini Goodrich & Rosati

(57) **CLAIM**  
The ornamental design for an apparel with bioceramic surface ornamentation, as shown and described.

**DESCRIPTION**  
FIG. 1 is a front view of a first embodiment of an apparel with bioceramic surface ornamentation; the broken lines depict portion of a garment representing an exemplary apparel;  
FIG. 2 is a front view of a second embodiment of an apparel with bioceramic surface ornamentation; the broken lines depict portion of a garment representing another exemplary apparel;  
FIG. 3 is a front view of a third embodiment of an apparel with bioceramic surface ornamentation; the broken lines depict a shirt representing another exemplary apparel;  
FIG. 4 is a front view of a fourth embodiment of an apparel with bioceramic surface ornamentation; the broken lines depict a short pants representing another exemplary apparel;  
FIG. 5 is a front view of a fifth embodiment of an apparel with bioceramic surface ornamentation; the broken lines depict a short pants representing another exemplary apparel; and,  
FIG. 6 is the front view of a sixth embodiment of an apparel with a bioceramic surface ornamentation; the broken lines depict an arm band representing another exemplary apparel. In the drawings, the broken lines depict environmental subject matter only and form no part of the claimed design; the darker and lighter shading represent color contrasting.

**1 Claim, 6 Drawing Sheets**



(56)

## References Cited

## U.S. PATENT DOCUMENTS

5,972,815	A	10/1999	Bae	
6,506,403	B1	1/2003	Yu	
6,516,229	B1	2/2003	Wey	
6,645,517	B2	11/2003	West et al.	
6,669,882	B2	12/2003	Seok	
6,797,377	B1	9/2004	DeLucia et al.	
6,884,256	B2	4/2005	Huang et al.	
6,951,900	B2	10/2005	Blanchard et al.	
7,063,801	B2	6/2006	Sato	
7,074,499	B2	7/2006	Schnurer et al.	
D598,660	S *	8/2009	Schaller	D5/63
7,824,350	B2	11/2010	Lu	
D629,210	S *	12/2010	Hong	D5/30
D631,971	S *	2/2011	Turtzo	D24/209
8,104,482	B2	1/2012	Komuro	
8,231,968	B2	7/2012	Lin et al.	
D664,739	S *	8/2012	Gibson	D2/840
D667,226	S *	9/2012	Levy	D5/63
8,333,018	B2	12/2012	Lin et al.	
8,366,757	B2	2/2013	Oliveira	
8,388,750	B2	3/2013	Gay et al.	
8,409,262	B2	4/2013	Lin et al.	
D704,455	S *	5/2014	Blakely	D5/63
8,815,158	B2	8/2014	Zheng et al.	
8,968,819	B2	3/2015	Hirata	
8,980,775	B2	3/2015	Francy et al.	
9,044,384	B2	6/2015	Canova et al.	
9,120,959	B2	9/2015	Hara et al.	
D746,543	S *	1/2016	McClain	D2/731
2002/0014716	A1	2/2002	Seok	
2002/0042641	A1	4/2002	Johnson	
2002/0195751	A1	12/2002	Kim et al.	
2004/0087430	A1	5/2004	Sola	
2004/0202899	A1	10/2004	Komuro	
2004/0225049	A1	11/2004	Komuro	
2005/0171584	A1	8/2005	Slingo	
2006/0137701	A1	6/2006	Snaird	
2006/0275348	A1	12/2006	Komuro	
2009/0065732	A1	3/2009	Yeh et al.	
2009/0171266	A1	7/2009	Harris	
2009/0267271	A1	10/2009	Kim	
2010/0186917	A1	7/2010	Simonson et al.	
2010/0282433	A1 *	11/2010	Blackford	A41D 31/0038 165/46
2011/0059037	A1	3/2011	Canova et al.	
2011/0112461	A1	5/2011	Hirata	
2011/0208099	A1	8/2011	Naghavi et al.	
2012/0135485	A1	5/2012	Koros et al.	
2014/0079920	A1 *	3/2014	Blakely	A41B 17/00 428/196
2014/0087040	A1	3/2014	Vissman et al.	
2014/0173801	A1	6/2014	Bell	
2014/0187413	A1	7/2014	Lagaron et al.	
2014/0209594	A1	7/2014	Besner	
2014/0264186	A1	9/2014	Spatz et al.	
2014/0324132	A1	10/2014	Wey	
2015/0017856	A1	1/2015	Davis et al.	
2015/0224230	A1	8/2015	Hirata	
2015/0291868	A1	10/2015	Rajagopalan et al.	
2015/0335742	A1	11/2015	Vissman et al.	

## FOREIGN PATENT DOCUMENTS

BR	MU9000125-7	9/2011
BR	MU90010191	1/2012
EP	1816254	8/2007
GB	883264	11/1961
GB	1093041	11/1967
GB	1378140	12/1974
GB	2073613	10/1981
JP	2000-119987	A 4/2000
KR	200500461213	5/2005
KR	101067409	9/2011

WO	WO-02/059414	8/2002
WO	WO-2009/124367	10/2009
WO	WO-2015171467	A1 11/2015

## OTHER PUBLICATIONS

- Aksenov, M.Y.; Markesbery, W.R. "Changes in thiol content and expression of glutathione redox system genes in the hippocampus and cerebellum in Alzheimer disease." *NeurosciLett*, v. 302, p. 141-145, 2001.
- Bagnato et al., "Far infrared emitting plaster in knee osteoarthritis: a single blinded, randomised clinical trial", *Reumatismo*, 2012, 64 (6): 388-394.
- Bannister, J.V.; Calabrese, L. Assays for superoxide dismutase. *Methods Biochem Anal*, v. 32, p. 279-312, 1987.
- Beever, "Far-infrared saunas for treatment of cardiovascular risk factors" *Canadian Family Physician*, vol. 55: Jul. 2009.
- Cidral-Filho, F. and D. Martins. "Neurobiological Mechanisms and Perspectives on Far-Infrared Emitting Ceramic Materials for Pain Relief" *J Yoga Phys Ther*. 4 (2):159.
- Conrado et al., "Reduction in body measurements after use of a garment made with synthetic fibers embedded with ceramic nanoparticles", *Journal of Cosmetic Dermatology*, 10, 1, 30-35, 2011.
- eSilva et al., "Effects of the Use of MIG3 Bioceramics Fabrics Use—Long Infrared Emitter—in Pain, Intolerance to Cold and Periodic Limb Movements in Post-Polio Syndrome", *Arq Neuropsiquiatr* 2009; 67(4): 1049-1053.
- Esterbauer, H., Cheeseman, K.H. "Determination of aldehydic lipid peroxidation products: malonaldehyde and 4-hydroxynonenal." *Methods Enzymol*, v. 186, p. 407-421, 1990.
- Gale et al., "Infrared therapy for chronic low back pain: A randomized, controlled trial", *Pain Res Manage*, vol. 11, No. 3 Autumn 2006.
- Hong, R. "Effects of Heat Therapy using a far infrared rays heating element for dysmenorrhea in high school girls". *J Korean Acad. Nurs* vol. 41 No. 1, 141-148, 2011.
- Hsieh et al., Local and Systemic Cardiovascular Effects from Monochromatic Infrared Therapy in Patients with Knee Osteoarthritis: A Double-Blind, Randomized, Placebo-Controlled Study, Evidence-Based Complementary and Alternative Medicine, vol. 2012, 9 pages.
- Ke Y. et al. "Effects of Somatothermal Far-Infrared Ray on Primary Dysmenorrhea: A Pilot Study". *Evidence-Based Complementary and Alternative Medicine*, vol. 2012, Article ID 240314, doi: 10.1155/2012/240314.
- Kim et al., "Bioceramic Effects to Enhance Secondary Metabolites Production in Tissue Culture of Some Medicinal Plants", *Korean J. Medicinal Crop Sci*. 12(2) : 118-122 (2004).
- Ko et al., "Effect of Ceramic-Impregnated "Therflow" Gloves on Patients with Raynaud's Syndrome: Randomized, Placebo-Controlled Study", *Alternative Medicine Review*, Aug. 2002; vol. 7(4), pp. 328-335.
- Leung et al., "Biological effects of melt spinning fabrics composed of 1% bioceramic material", *Textile Research Journal*, 82(11) 1121-1130, downloaded from trj.sagepub.com Mar. 11, 2013.
- Leung et al., "Bone and Joint Protection Ability of Ceramic Material with Biological Effects", *Chinese Journal of Physiology* 55(1): 47-54, 2012.
- Leung et al., "Direct and Indirect Effects of Ceramic Far Infrared Radiation on the Hydrogen Peroxide-scavenging Capacity and on Murine Macrophages under Oxidative Stress", *Journal of Medical and Biological Engineering*, 31(5): 345-351.
- Leung et al., Effects of Far Infrared Rays Irradiated from Ceramic Material (Bioceramic) on Psychological Stress-Conditioned Elevated Heart Rate, Blood Pressure, and Oxidative Stress-Suppressed Cardiac Contractility, *Chinese Journal of Physiology* 55(5): 323-330, 2012.
- Leung et al., "In vitro cell study of the Possible Anti-inflammatory and Pain Relief Mechanism of Far-infrared Ray-emitting Ceramic Material", *J. Med. and Biol. Eng.* 33(2): 179-184.
- Leung et al., "Protective effect of non-ionized radiation from far infrared ray emitting ceramic material (cFIR) against oxidative

(56)

**References Cited**

## OTHER PUBLICATIONS

stress on human breast epithelial cells”, *Articles in Press, J. Med. Biol. Eng.* (Jul. 28, 2012), doi: 10.5405/jmbe.1133.

Leung T. et al. Physical-chemical Test Platform for Room Temperature, Far-infrared Ray Emitting Ceramic Materials (cFIR). Published online on Oct. 12, 2011; doi: 10.1002/jccs.201190101.

Levine, R.L.; Garland, D.; Oliver, C.N.; Amici, A.; Climent, I.; Lenz, A.G.; Ahn, B.W.; Shaltiel, S.; Stadman, E.R. “Determination of carbonyl content in oxidatively modified proteins.” *Methods Enzymol*, v. 186, p. 464-478, 1990.

Liau et al., “Inhibitory Effects of Far-Infrared Ray-Emitting Belts on Primary Dysmenorrhea”, *International Journal of Photoenergy*, vol. 2012, published 2012, 6 pages.

Lin et al. “Enhancement of Transdermal Delivery of Indomethacin and tamoxifen by Far-Infrared Ray-Emitting Ceramic material (Bioceramic): A Pilot Study.” *Translational Medicine* 2013, 3:1.

Lin et al., “Antioxidant Effect of Far-Infrared Radiation in Human” *Journal of Public Health Frontier*. Jun. 2013, vol. 2 Iss. 2, pp. 97-102.

Lowry, O.H.; Rosebrough, N.J.; Farr, A. “Protein measurement with the Folin phenol reagent.” *J BiolChem*, v. 193, p. 265-275, 1951. PCT/US2013/060636 International Search Report and Written opinion dated Dec. 10, 2013.

Vatansever F. and Hamblin M. “Far infrared radiation (FIR): its biological effects and medical applications.” *Photon Lasers Med* 2012; 1(4): 255-266.

“What is Complementary and Alternative Medicine?” (Oct. 2008), Retrieved Aug. 2012 from <http://nccam.nih.gov/health/whatiscom>.

Yoo et al., “Investigation of jewelry powders radiating far-infrared rays and the biological effects on human skin”, *J. Cosmet Sci.*, 53, (May/Jun. 2002), 175-184.

York R. and Gordon I., Effect of optically modified polyethylene terephthalate fiber socks on chronic foot pain. *BMC Complementary and Alternative Medicine* 2009, 9:10 doi: 10.1186/1472-6882-9-10.

PCT/US2013/060636 International Preliminary Report on Patentability mailed Apr. 9, 2015.

U.S. Appl. No. 13/760,546 Office Action mailed Apr. 9, 2015.

U.S. Appl. No. 13/760,546 Office Action dated Sep. 23, 2015.

U.S. Appl. No. 14/965,746 Office Action dated Mar. 24, 2016.

\* cited by examiner

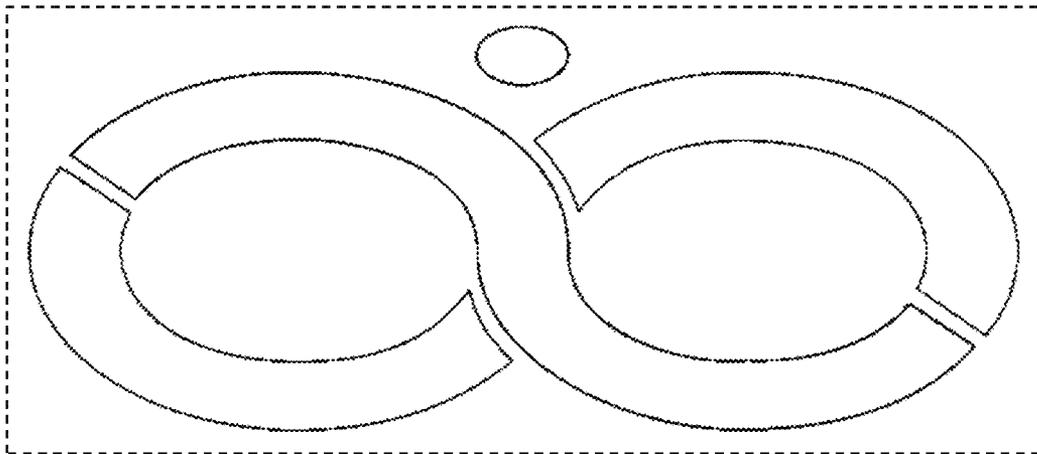


FIGURE 1

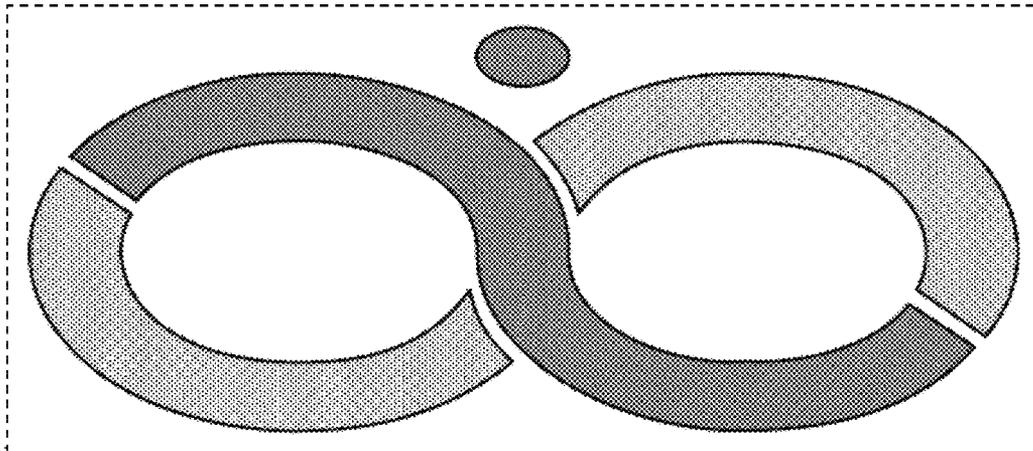


FIGURE 2

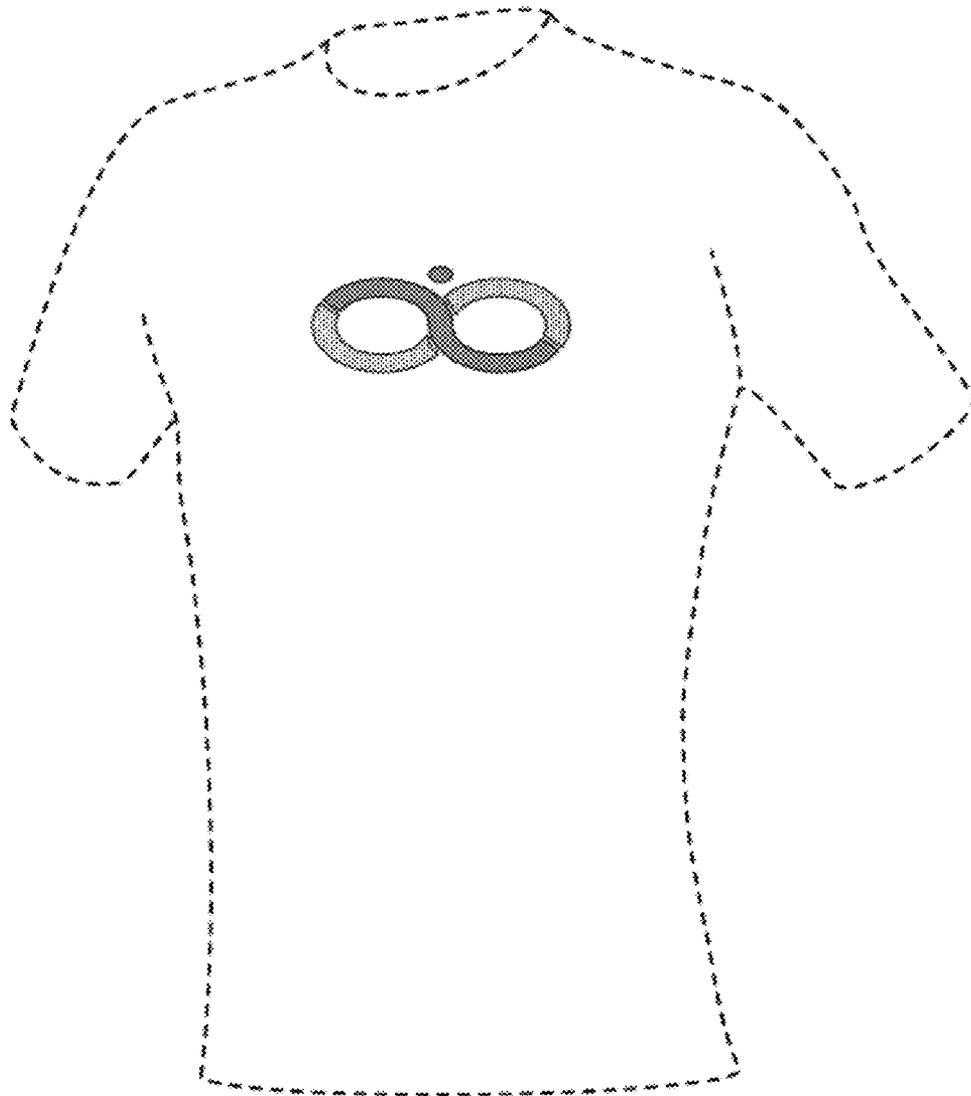


FIGURE 3

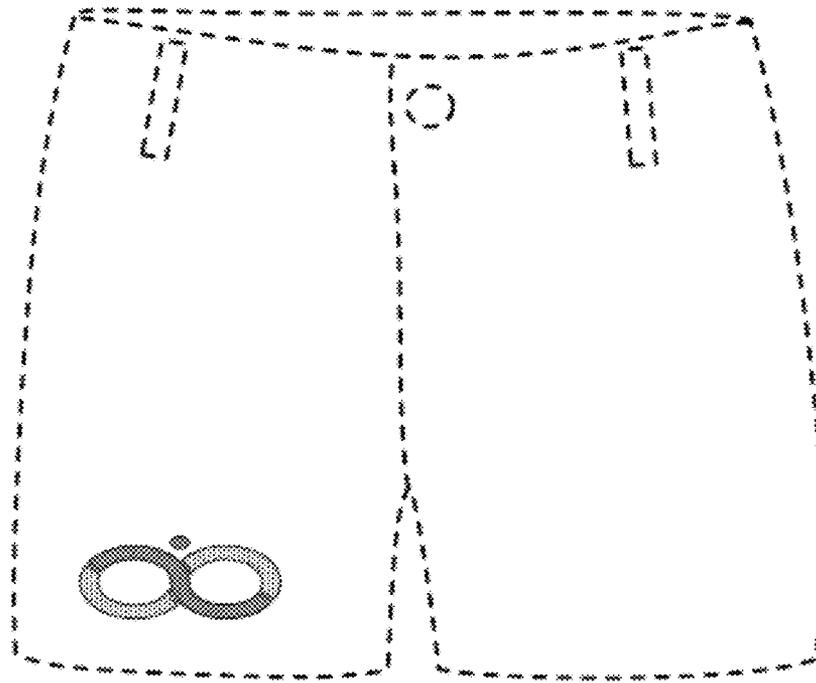


FIGURE 4

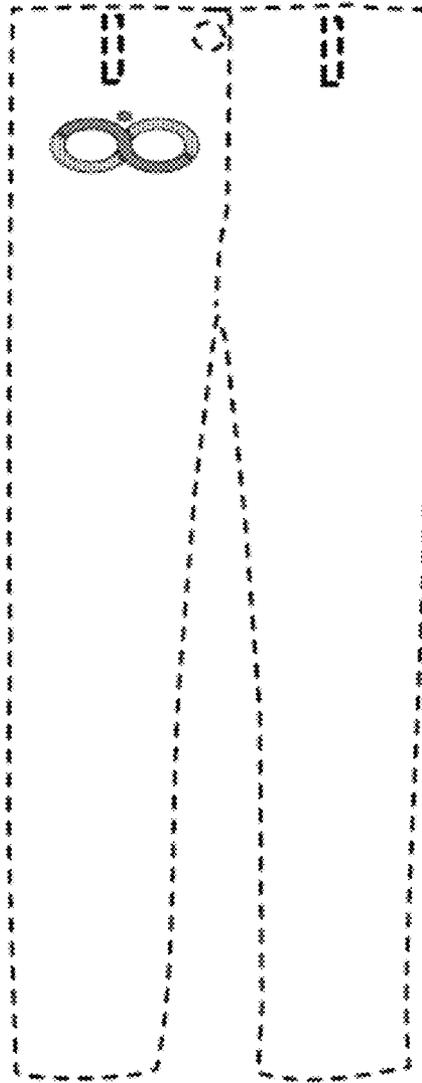


FIGURE 5

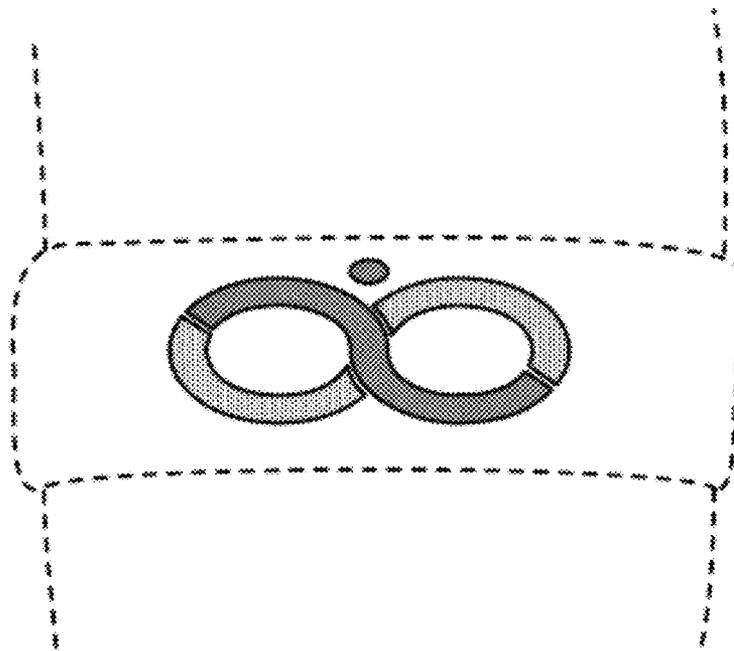


FIGURE 6