Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MOTIF FOODWORKS, INC.,

Petitioner,

v.

IMPOSSIBLE FOODS INC.,
Patent Owner.

U.S. Patent No. 9,943,096

"METHODS AND COMPOSITIONS FOR AFFECTING THE FLAVOR AND AROMA PROFILE OF CONSUMABLES"

Inter Partes Review No. 2023-00206

PETITIONER'S UPDATED EXHIBIT LIST

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EX1027	Pearson & Gillett, PROCESSED MEATS Ch. 3 (3d ed. 1996)
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EX1032	Cerny & Davidek, *Formation of Aroma Compounds from Ribose and Cysteine during the Maillard Reaction*, 51 J. ARGRIC. FOOD CHEM. 2714-21 (2003)

EX1033	Reineccius, FLAVOR CHEMISTRY AND TECHNOLOGY CH. 5 (2d ed. 2006)
EX1034	Reineccius, FLAVOR CHEMISTRY AND TECHNOLOGY CH. 9 (2d ed. 2006)
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EX1043	Dreher et al., *GC−Olfactometric Characterization of Aroma Volatiles from the Thermal Degradation of Thiamin in Model Orange Juice*, 51 J. AGRIC. FOOD CHEM. 3097-102 (2003)
EX1045	Hofmann & Schieberle, *Evaluation of the Key Odorants in a Thermally Treated Solution of Ribose and Cysteine by Aroma Extract Dilution Techniques*, 43 J. AGRIC. FOOD CHEM. 2187-2194 (1995)
EX1046	Goto et al., *Iron Fortification of Rice Seed by the Soybean Ferritin Gene*, 17 NATURE BIOTECH. 282-86 (1999)
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EX1056	Klesk & Qian, *Aroma Extract Dilution Analysis of Cv. Marion (*Rubus spp. hyb*) and Cv. Evergreen (*R. laciniatus L.*) Blackberries*, 51 J. AGRIC. FOOD CHEM. 3436-41 (2003)
EX1057	Krumina-Zemture et al., *Amino Acid and Dietary Fibre Content of Pea an Buckwheat Flours*, RESEARCH FOR RURAL DEVELOPMENT 2016 VOL. 1, 84-90
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EX1060	Marchand et al., *Possible Mechanism for Involvement of Cysteine in Aroma Production in Wine*, 50 J. AGRIC. & FOOD CHEM. 6160-64 (2002)

EX1064	Splivallo et al., *Bacteria Associated with Truffle-Fruiting Bodies Contribute to Truffle Aroma*, 17 ENV'T MICROBIOLOGY 2647-60 (2015)
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EX1070	Karaca, *Nanostructured Proteins*, *in* FOOD STRUCTURE AND FUNCTIONALITY 181-200 (Galanakis ed., 2021)
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EX1072	Green, *Headspace Analysis|Static*, *in* ENCYCLOPEDIA OF ANALYTICAL SCIENCE 229-36 (2d ed. 2005)
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EX1074	dos Santos & Grenha, *Polysaccharide Nanoparticles for Protein and Peptide Delivery: Exploring Less-Known Materials*, 98 Advances in Protein Chem. and Structural Biology 223-61 (2015)
EX1078	U.S. Patent No. 8,802,399 to Reutter-Maier et al., issued August 12, 2014
EX1079	U.S. Patent No. 6,218,168 to Leinfelder et al., issued April 17, 2001
EX1080	U.S. Patent No. 4,760,139 to Feniou et al., issued July 26, 1988

EX1081	U.S. Patent No. 8,609,890 to Hu, issued December 17, 2013
EX1083	Buffo & Han, *Edible Films and Coatings from Plant Origin Proteins*, *in* FOOD SCIENCE & TECHNOLOGY, INNOVATIONS IN FOOD PACKAGING 277-300 (2005)
EX1084	Fellows, FOOD PROCESSING TECHNOLOGY: PRINCIPLES AND PRACTICE Ch. 6 (3d ed. 2009)
EX1085	WACKER CHEMIE AG, *Fermopure – Plant-Based L-cystine and L-cysteine* (2021), available at https://www.wacker.com/cms/en-us/products/brands/fermopure/fermopure.html
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EX1099	Mottram, *The Maillard Reaction: Source of Flavour in Thermally Processed Foods*, *in* FLAVOURS AND FRANGRANCES 269-83 (Berger ed., 2007)

EX1100	Ulrich et al., *Investigation of the Boiled Potato Flavor by Human Sensory and Instrumental Methods*, 77 AM. J. POTATO RSCH. 111-17 (2000)
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EX1115	d'Estries, *Science Reveals Which Plant-Based Burger Smells Closest to the Real Thing*, TREEHUGGER, https://www.treehugger.com/science-reveals-plant-based-burger-smells-5200260
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EX1120	Adam McQueen, *Beyond Meat vs. Impossible Foods: The Very Real Battle Between the Biggest 'Fake-Meat' Competitors*, KLUE, https://klue.com/blog/beyond-meat-vs-impossible-foods-the-very-real-battle-between-the-biggest-fake-meat-competitors
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EX1122	Saha & Bhattacharya, *Hydrocolloids as Thickening and Gelling Agents in Food: A Critical Review*, 47 J. FOOD SCI. & TECH. 587-97 (2010)
EX1123	*Meat Consumption*, OECD (2022), https://data.oecd.org/agroutput/meat-consumption.htm
EX1129	Mottram, *Volatile Compounds from the Reaction of Cysteine, Ribose, and Phospholipid in Low-Moisture Systems*, 43 J. AGRIC. FOOD CHEM. 984-88 (1995)
EX1130	Kang et al., *Gelation and Gel Properties of Soybean Glycinin in a Transglutaminase-Catalyzed System*, 42 J. AGRIC. FOOD CHEM. 159-65 (1994)

EX1131	Nio et al., *Gelation Mechanism of Protein Solution by Transglutaminase*, 50 AGRIC. & BIOLOGICAL CHEM. 851-55 (1986)
EX1132	U.S. Patent No. 4,153,738A to Ronai et al., issued May 8, 1979
EX1133	Hargrove et al., *Characterization of Recombinant Soybean Leghemoglobin a and Apolar Distal Histidine Mutants*, 266 J. MOLECULAR BIOLOGY 1032-42 (1997)
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EX1141	Evers et al., *Furan Substituted at the Three Position with Sulfur*, *in* PHENOLIC, SULFUR, AND NITROGEN COMPOUNDS IN FOOD FLAVORS SYMPOSIUM 184-93 (1976)
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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned hereby certify that Petitioner's Updated Exhibit List was served on Patent Owner on May 4, 2023 by e-mailing copies to:

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