



Express Search

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Mr. Express Search Internal
Express Search, Inc
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Re:
Patentability Novelty Search
Ultra Roasted Coffee
Express Search Sample Patentability Search

June 18, 2019

Dear Mr. Search,

In accordance with your e-mail received on June 11, 2019, a Patentability Novelty Search was conducted for ultrafast roasted coffee.

Disclosed herein is a coffee product which when brewed is characterized by having a reduced bitterness and improved freshness retention or brew holding quality. The coffee product is produced by an ultrafast roasting process wherein a blend of green coffee beans is roasted to a specific color preferably using a fluidized bed roaster at temperatures of from about 550°F (288°C) to about 750°F (399°C) for 30 to 120 seconds. The roasted coffee is quenched with air or inert gas, and ground or flaked, in accordance with the disclosure provided.

The following references for 'Ultra Roasted Coffee' appear to be most relevant:

4,322,447 [Hubbard] discloses a coffee roasting process for forming a low density roasted coffee having a yield of high soluble solids in which the green coffee beans are dry roasted by passage in a fluidized bed through a two-stage roaster. In the first stage, the beans are heated to a temperature of 550° F. to 570° F. by a roasting gas for partial roasting and expansion of their cellular structure. Then, in the second zone, the beans are contacted with an independent roasting gas stream at the same temperature and lower velocity to complete the roasting process (Figure 1; Column 2, Lines 22-64; Claim 1).

6,207,211 [Wasserman et al] discloses a two stage coffee roasting process comprising a first stage, where green coffee beans are roasted for 5-15 minutes to a roast color of 30-50 Lu. In a second stage, the beans are further roasted for 1/2-3 1/2 minutes. The roasted beans have a reduced density in the range of 0.27-0.38, and a roast color of 4-19 Lu. Analysis of sulfur compounds in the

coffee aroma reveals a high level of methylmercaptan, a key compound for the pleasant aroma of freshly roasted and ground coffee. Coffee beans roasted in accordance with the present invention have a generally high titratable acidity at a given density and roast color (Column 1, Lines 55-67; Claim 1).

5,721,005 [Gutwein et al] discloses roast and ground or flaked coffee products which provide more brew strength and cup color at lower levels of brews solids. These coffee products contain darker roasted coffee that is predominantly high acidity-type coffee that provide, when brewed in appropriate conditions, a consumable coffee beverage having: (1) a brew solids level of from about 0.4 to about 0.6%; (2) a Titratable Acidity of at least about 1.52; (3) a brew absorbance of at least about 1.25, provided that when the Titratable Acidity is in the range of from about 1.52 to about 2.0, the brew absorbance is equal to or greater than the value defined by the equation: where TA is the Titratable Acidity (Column 2, Lines 65-67; Column 3, Lines 1-8; Claim 1).

5,185,171 [Bersten] discloses a roaster for coffee beans or the like, that admits the beans into a roasting air stream (31, 23, 32) at an air stream entrance (24). The air stream transports the beans from entrance (24) in an air stream path (26, 36) to an altitude (36) from where they are directed to return to entrance (24) by falling into a hopper having side wall (13, 14) and a constriction (22) which controls the rate of admission of the beans into the air stream. In preferred embodiments the beans are admitted into a horizontal air stream with a component of velocity in the air flow direction and roasting air is also admitted to the hopper directly (46) or indirectly (44, 45) via wall perforations (19, 20) (Column 1, Lines 61-68; Column 2, Lines 1-5; Claim 1).

6,106,877 [Allington et al] discloses bulk material formed by a multiplicity of individual moving particles. The material is heat-treated by directing a light beam into an observation volume of the material to generate light reflections off at least one particle in the observation volume. A characteristic of the light reflections is indicative of a desired extent to which the material is to be heat-treated, and the material is subjected to a heated environment. The light reflections are monitored for the characteristic, and subjecting the material to the heated environment is ended in response to detecting the characteristic of the light reflections (Column 2, Lines 26-45; Claim 5).

The following non-patent literature articles were uncovered during the search:

Buffo, Roberto A., and Claudio Cardelli-Freire. "Coffee flavour: an overview." *Flavour and fragrance journal* 19.2 (2004): 99-104.
<http://www2.hcmuaf.edu.vn/data/lhquang/file/Coffee/coffee%20flavour.pdf>
Disclosing fast roasting for periods as short as 90 seconds or as long as 40 min, as is often the case in Brazil, as the time influences the reactions within the coffee bean, and coloring to dark brown in the presence of CO₂ gasses (Page 99).

Schwartzberg, Henry. "Batch coffee roasting; roasting energy use; reducing that use." *Advances in Food Process Engineering Research and Applications*. Springer US, 2013. 173-195.
<http://www.icef11.org/content/papers/fpd/fpd260.pdf>
Discloses roasting green beans with engineered effect and cooling with inert gasses (the 3rd & 4th Pages; high-speed roasting on the 8th Page).

Żyżelewicz, Dorota, et al. "Application of various methods for determination of the color of cocoa beans roasted under variable process parameters." *European Food Research and Technology* 238.4 (2013): 549-563.
<http://link.springer.com/article/10.1007/s00217-013-2123-6/fulltext.html>
Discloses correlation of color with duration of fast roasting & drying processes.

Guenther, Helmut, et al. "Furan in coffee: pilot studies on formation during roasting and losses during production steps and consumer handling." *Food Additives and Contaminants* 27.3 (2010): 283-290.
http://www.tara.tcd.ie/xmlui/bitstream/handle/2262/52969/PEER_stage2_10.1080%252F19440040903317505.pdf?sequence=1&isAllowed=y
Discloses analysing pilot plant samples that were roasted to cover qualities from light- to dark-roasted and from fast- to long-roasted coffees producing darker roast colors from longer roast times (draft copy Pages 7 and 8 - figures are not present).

Schenker, S., et al. "Pore structure of coffee beans affected by roasting conditions." *Journal of Food Science* 65.3 (2000): 452-457.
<http://lib3.dss.go.th/fulltext/Journal/Journal%20of%20food%20science/2000%20v.65/no.3/jfsv65n3p0452-0457ms19990446%5B1%5D.pdf>
Discloses faster degassing and oil migration as well as enhanced oxygen accessibility and accelerated loss of flavor compounds during hot air roasting is promoted in beans with larger micropores (Pages 453-455).

The following Examiner was consulted regarding the field of search:

Examiner Valdez in Art Unit 1794

The following classes and subclasses were searched:

Class 034 (Drying And Gas Or Vapor Contact With Solids)

Subs. 10, 282, 359, 360, 384, 386, 523, 576, 586, 606

Class 241 (Solid Material Comminution Or Disintegration)

Subs. 6

Class 426 (Food Or Edible Material: Processes, Compositions, And Products)

Subs. 443, 465, 466, 467, 468, 518, 595, 665

The following CPC classes and subclasses were searched:

Class A23F (COFFEE)

5/00 Coffee

5/02 Coffee; Treating green coffee

5/04 Coffee; Methods of roasting coffee

5/046 Coffee; Methods of roasting coffee; {with agitation or transportation of the beans by gases Fluidised-bed roasting or fluidised-bed cooling after roasting }

5/08 Coffee; Methods of grinding coffee

5/10 Coffee; Treating roasted coffee

5/105 Coffee; Treating roasted coffee; {Treating in vacuum or with inert

or noble gases Storing in gaseous atmosphere Packaging}

5/12 Coffee; Treating roasted coffee; Agglomerating flaking or tableting

5/24 Coffee; Extraction of coffee

Class A23N (MACHINES OR APPARATUS FOR TREATING HARVESTED FRUIT, VEGETABLES OR FLOWER BULBS IN BULK, NOT OTHERWISE PROVIDED FOR)

12/00 Machines for cleaning blanching drying or roasting fruits or vegetables eg coffee cocoa nuts

12/08 Machines for cleaning blanching drying or roasting fruits or vegetables eg coffee cocoa nuts; for drying or roasting

12/083 Machines for cleaning blanching drying or roasting fruits or vegetables eg coffee cocoa nuts; for drying or roasting; {with stirring vibrating or grinding devices}

The following U.S. references for 'Ultra Roasted Coffee' were cited in the search:

6,607,768 [Eichner]	6,207,211 [Wasserman et al]	6,106,877 [Allington et al]
5,939,121 [Gutwein et al]	5,721,005 [Gutwein et al]	5,322,703 [Jensen et al]
5,292,005 [Wireman et al]	5,257,574 [Hiromichi]	5,185,171 [Bersten]
4,988,590 [Price et al]	4,985,271 [Neilson et al]	4,591,508 [Pultinas]
4,540,591 [Dar et al]	4,428,535 [Venetucci]	4,322,447 [Hubbard]

The following foreign references for 'Ultra Roasted Coffee' were also noted of interest:

JP 2007300937A [Sugimoto et al]

EP 0405648B1 [Kirkpatrick et al]

These patents are representative of the references searched. Copies of the cited references are enclosed for your further review. For additional information on the cited references, please see the patent family, located on the CD results, for related patents and the legal status of cited patents. Please do not hesitate to contact me with any questions regarding this search.

Best Regards,
EXPRESS SEARCH



Cristopher H. Flagg
President

CHF

Enclosure: References for 'Ultra Roasted Coffee' – 17 Patents and 5 NPL
References

Ref: E00-40001