

(19)



(11)

EP 3 874 970 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

08.09.2021 Bulletin 2021/36

(51) Int Cl.:

A24B 13/00 (2006.01)

A24B 15/16 (2020.01)

A24B 15/30 (2006.01)

(21) Application number: **20160696.9**

(22) Date of filing: **03.03.2020**

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

Designated Extension States:

BA ME

Designated Validation States:

KH MA MD TN

(71) Applicant: **Reemtsma Cigarettenfabriken GmbH
22761 Hamburg (DE)**

(72) Inventors:

- Lewerenz, Nathalie
22761 Hamburg (DE)**
- Rössing, Ina
22761 Hamburg (DE)**

(74) Representative: **Gulde & Partner**

Patent- und Rechtsanwaltskanzlei mbB

Wallstraße 58/59

10179 Berlin (DE)

(54) **FILLING MATERIAL FOR AN ORAL POUCHED SMOKELESS PRODUCT AND ORAL POUCHED SMOKELESS PRODUCT MANUFACTURED THEREFROM**

(57) The present invention is directed to a filling material for use in an oral pouched smokeless product, the filling material comprising tobacco material, characterized in that the total tobacco material content of the filling material consists of tobacco material derived from tobacco stalks, tobacco roots, tobacco flowers or combinations thereof.

EP 3 874 970 A1

Description

[0001] Consumption of smokeless tobacco-based products, like e.g. pouched smokeless tobacco products for oral consumption (e.g. snus or moist snuff), is common in societies. However, the use of tobacco material in such products limits the organoleptic properties of these products. The tobacco material commonly used in these products has a typical colour, texture, smell and taste which may not always be attractive to the consumer.

[0002] In order to address these issues, the use of bleached or whitened tobacco material has been proposed, wherein the tobacco material has been subjected to chemical treatment, heat treatment or combinations thereof to alter the colour appearance of the tobacco material towards a light-coloured appearance. However, bleaching or whitening of tobacco material is laborious and time consuming.

[0003] Consequently, there is a need for a tobacco-containing filling material for oral pouched smokeless products having a light-coloured appearance, while offering widespread opportunities to influence the organoleptic properties of the product.

[0004] The present invention provides a filling material for use in an oral pouched smokeless product like e.g. snus or moist snuff, wherein the filling material comprises a total amount of tobacco material, characterized in that the total amount of tobacco material of the filling material consists of tobacco material derived from tobacco stalks, tobacco roots, tobacco flowers or combinations thereof, preferably derived from tobacco stalks, tobacco roots or combinations thereof. In other words, the filling material of the present invention lacks any tobacco material other than tobacco material derived from tobacco stalks, tobacco roots, tobacco flowers or combinations thereof. That is, the filling material of the present invention is void of any tobacco material derived from other parts of the tobacco plant like e.g. tobacco leaf or tobacco stem.

[0005] The use of tobacco material derived from tobacco stalks, tobacco roots, tobacco flowers or combinations thereof instead of tobacco material derived from parts of the tobacco plant that are usually used in manufacturing of snus or snuff, like e.g. tobacco material derived from tobacco leaf or stem, allows for the provision of light-coloured filling material without the need for additional bleaching or whitening of the tobacco material. The present invention makes use of the natural phenomenon that certain parts of the tobacco plant like stalks, roots and flower have a lighter appearance than other parts of the tobacco plant like leaf and stem, especially after curing and/or fermentation of tobacco material derived from said parts of the tobacco plant. Thus, light-coloured filling material for an oral pouched smokeless product comprising tobacco material are provided that are light-coloured while being free of any traces of bleaching or whitening agents and/or while saving efforts for additional bleaching or whitening of tobacco material or filling material.

[0006] In order to provide a filling material that has a desired nicotine content, the filling material preferably further comprises non-tobacco plant material that has been partially or fully coated with nicotine.

[0007] Thus, the present invention provides a filling material for an oral pouched smokeless product with unique organoleptic properties (like e.g. light-coloured appearance) which may differ substantially from common fillings while ensuring that the filling material encompasses nicotine in a pre-determined amount. Thereby, it is possible to provide a nicotine-containing filling material with a taste, smell, touch, sight and/or other organoleptic properties that cannot be achieved with common tobacco-based fillings. In particular, the present invention provides a filling material for an oral pouched smokeless product with a whitened or light-coloured appearance without the need to use bleached or whitened tobacco material.

[0008] The present invention provides a filling material for an oral pouched smokeless product. Oral pouched smokeless products are products for oral use which comprise a filling material which is encompassed in a pouch made of pouch material wherein the pouch material ensures that during consumption the particulate parts of the filling predominantly stay within the pouch while saliva- or water-soluble parts of the filling are at least in part allowed to pass the pouch material. Such oral pouched smokeless products are consumed by placing the pouched product into the oral cavity, most commonly between the lower gum and lip or upper gum and lip. By contact with the saliva, constituents of the filling elute from the pouch and are consumed by the consumer.

[0009] The filling material of the present invention comprises tobacco material, wherein said tobacco material is derived from tobacco stalks, tobacco roots, tobacco flowers or combinations thereof. As used herein, the term "tobacco material" denotes material derived from a part of any member of a plant of the genus *Nicotiana*. The tobacco material may be whole, shredded, threshed, cut, ground, cured, fermented, processed, pasteurized reconstituted or otherwise treated. Preferably, the tobacco material used in the filling material of the invention is ground tobacco material. The tobacco material may also be in the form of finished products, including any smokeless tobacco compositions that are orally consumed. The tobacco material used herein encompasses tobacco material produced according to the well known technology e.g. used for production of tobacco material for common snus or moist snuff products.

[0010] The tobacco material used in the filling material of the invention, preferably, comprises or consists of tobacco material that has not been bleached or whitened.

[0011] Further, the tobacco material used in the filling material of the invention, optionally, comprises or consists of tobacco material that has been pasteurized. The filling material of the invention comprises tobacco material in a total amount or concentration of 0,1 to 15 weight-%, preferably in a concentration of 0,1 to 10 weight-%, more preferably in

a concentration of 2 to 8 weight-%, wherein indications in weight-% are based on the dry weight of the total filling material.

[0012] For the purpose of the present invention, the term "dry weight" means the weight of the reference excluding the weight of water and also other substances that may evaporate from the reference during drying.

[0013] The filling material of the invention preferably further comprises further ingredients to form the filling material.

5 The term "further ingredient", as used herein, refers to any substance other than tobacco material and (nicotine-coated) non-tobacco plant material. Such further ingredients preferably comprise one or more of stabilizers, humectants, plasticisers, thickeners, dyes, salts, flavours, gum base, flavour additives or any combination thereof. Exemplary embodiments of preferred further ingredients are NaCl, NH₄Cl, Na₂CO₃, propylene glycol, one or more flavours and/or combinations thereof.

10 [0014] The filling material of the invention preferably further comprises non-tobacco plant material. Said non-tobacco plant material is optionally present in the filling material of the invention in a concentration of 70 to 99 weight-%, preferably of 75 to 95 weight-%, more preferably of 80 to 90 weight-%, wherein indications in weight-% are based on the dry weight of the total filling material.

15 [0015] The optional non-tobacco plant material in the filling material according to the present invention is preferably present in the form of plant fibres, wherein the term "fibres" encompasses plant material that is in particulate form and which preferably but not necessarily has an average length that exceeds the average width of the particles of the plant material.

20 [0016] The non-tobacco plant material is derived from plants other than plants of the genus *Nicotiana*. The non-tobacco plant material may be derived from any part of such plants, e.g. leafs, stem, roots etc., or any combination of different parts of said plants. The non-tobacco plant material comprises or consists of plant material derived from one particular plant species or from a combination of different plant species, provided that none of these plant species represents a member of the genus *Nicotiana*.

25 [0017] The non-tobacco plant material preferably comprises or consists of fibres derived from natural sources. However, the fibres of non-tobacco plant material may be processed before use, such as washed, ground, cut, cured, aged, dried, fermented, chemically modified and/or otherwise.

[0018] Preferably, the non-tobacco plant material comprises or consists of wheat fibres, oat fibres, potato fibres, bamboo fibres, buckwheat fibres, barley fibres, microcrystalline cellulose and/or combinations thereof. More preferably, the non-tobacco plant material comprises or consists of wheat fibres; particularly preferably the non-tobacco plant material comprises or consists of gluten-free wheat fibres.

30 [0019] In a preferred embodiment, the non-tobacco plant material comprised in filling material of the invention comprises or consists of non-tobacco plant material that is, partially or fully, coated with nicotine. The nicotine content in the nicotine-coated non-tobacco plant material is preferably within the range of 0,1 to 10 weight-%, more preferably of 1 to 5 weight-%, even more preferably of 2,5 to 4,5 weight-%, particularly preferably of about 3,35 weight-%, wherein indications in weight-% are based on the dry weight of the nicotine-coated non-tobacco plant material.

35 [0020] The person skilled in the art is well aware of suitable means and methods to provide nicotine-coated non-tobacco plant material for use in the filling material of the present invention. Preferably, said nicotine-coated non-tobacco plant material is coated with nicotine using a liquid solution comprising nicotine. More preferably, the non-tobacco plant material is coated with nicotine using a liquid solution comprising nicotine and glycerol. More preferably, the non-tobacco plant material is coated with nicotine using a nicotine-in-glycerol solution. For the purpose of the present invention, the term "nicotine-in-glycerol solution" refers to a liquid solution wherein the combined content of nicotine and glycerol together make up at least 90 weight-% of the total weight of the nicotine-in-glycerol solution, preferably at least 95 weight-%, more preferably at least 99 weight-%. In the method described herein, the non-tobacco plant material may be coated with nicotine using a nicotine-in-glycerol solution wherein the nicotine is present in a concentration of 2 to 20 weight-%, preferably of 5 to 15 weight-%, more preferably of 10 weight-%, based on the total weight of the nicotine-in-glycerol solution.

45 [0021] It has surprisingly been found that coating of non-tobacco plant material with nicotine is particularly effective and/or sustained if said coating is performed using a nicotine-in-glycerol solution as defined above.

[0022] The person skilled in the art is well aware of methods suitable to coat non-tobacco plant material with nicotine using a nicotine-containing liquid solution. For example, the non-tobacco plant material can be coated with nicotine by applying the nicotine-containing liquid solution in a spray coating process or in a drum coating process.

50 [0023] The filling material of the present invention preferably has a water content of 25 to 55 weight-%, more preferably of 30 to 50 weight-%, even more preferably of 35 to 45 weight-%, based on the total weight of the filling material. As used herein, the term "water content" means the total water content in the filling material of the invention as measured using a standardized method of water analysis, such as, Karl Fisher titration of gas chromatography (GC).

55 [0024] The filling material of the present invention can be manufactured using various methods. In an exemplary embodiment, the filling material of the present invention is manufactured using the following method comprising steps a) to c).

- 5 a) coating non-tobacco plant material with nicotine using a liquid solution comprising nicotine;
- b) mixing tobacco material derived from tobacco stalks, tobacco roots, tobacco flowers or combinations thereof, the nicotine-coated non-tobacco plant material and optionally further ingredients and/or water to form the filling material; and
- c) optionally mixing the product of step b) with further ingredients and/or water.

10 [0025] In step a) non-tobacco plant material is provided and coated with nicotine using a liquid solution comprising nicotine. The product of step a) is non-tobacco plant material coated with nicotine. Said nicotine-coated non-tobacco plant material is subjected to step b).

15 [0026] In step b), the nicotine-coated non-tobacco plant material is mixed with further ingredients, like e.g. salt (e.g. NaCl), and tobacco material derived from tobacco stalk, tobacco root, tobacco flower or combinations thereof and optionally uncoated non-tobacco plant material. Optionally, prior to mixing with the nicotine-coated non-tobacco plant material said tobacco material is subjected to pasteurization, i.e. to a heat treatment step well known in the art in the manufacturing of snus filling. However, such pasteurization is optional. In an embodiment, all further ingredients of the filling material may be mixed in one step and steps b) and c) may be performed simultaneously.

20 [0027] The filling material of the present invention preferably comprises or consists of:

- 25 0,1 to 15 weight-% tobacco material derived from tobacco stalks, tobacco roots, tobacco flowers or combinations thereof, preferably tobacco material derived from tobacco stalks, tobacco roots or combinations thereof;
- 70 to 99 weight-% non-tobacco plant material, preferably nicotine-coated non-tobacco plant material; and
- 0 to 30 weight-% further ingredients;

wherein above-mentioned indications in weight-% are based on dry weight of the total filling material; wherein the optional nicotine-coated non-tobacco plant material preferably has a nicotine content within the range of 0,1 to 10 weight-% based on the dry weight of the nicotine-coated non-tobacco plant material; and wherein the filling material has a water content of 25 to 55 weight-% based on the total weight of the filling material.

30 [0028] Even more preferably, the filling material of the present invention comprises or consists of:

- 35 2 to 6 weight-% tobacco material derived from tobacco stalks, tobacco roots, tobacco flowers or combinations thereof, preferably derived from tobacco stalks, tobacco roots or combinations thereof;
- 75 to 85 weight-% non-tobacco plant material, preferably nicotine-coated non-tobacco plant material;
- 3 to 9 weight-% NaCl;
- 4 to 10 weight-% ammonium chloride (20%);
- 0,3 to 1,2 weight-% sodium carbonate;
- 40 2 to 5 weight-% propylene glycol; and

optionally one or more flavours;

45 wherein above-mentioned indications in weight-% are based on dry weight of the total filling material; wherein the optional nicotine-coated non-tobacco plant material has preferably a nicotine content within the range of 0,1 to 10 weight-% based on the dry weight of the nicotine-coated non-tobacco plant material; and wherein the filling material has a water content of 25 to 55 weight-% based on the total weight of the filling material.

50 [0029] The present invention is also directed to an oral pouched smokeless product comprising a filling material of the present invention. The oral pouched smokeless product of the invention can be manufactured by dividing the filling material of the invention into individual portions (portioning) and filling of the individual portions of the filling material into separate pouches (packaging).

[0030] In the following, the present invention is illustrated by way of examples.

EXAMPLES:

55 **Example 1:** Preparation of nicotine-coated non-tobacco plant material

[0031] In this Example, the non-tobacco plant material is coated with nicotine using a liquid nicotine-in-glycerol solution,

wherein the nicotine-in-glycerol solution is sprayed on the non-tobacco plant material in a fluidized bed process. Alternatively, the non-tobacco plant material can be coated with nicotine using a liquid nicotine-in-glycerol solution in a drum coating process.

5 a) 600g wheat fibres (WF 200 provided as VITACEL by J.Rettenmaier & Söhne GmbH & Co KG, DE) are spray coated with 350g nicotine-in-glycerol solution (10 weight-% nicotine in glycerol, provided by Siegfried Ltd, CH) in a fluidized bed process.

The desired amount of nicotine-in-glycerol solution was successfully coated onto the wheat fibres to give a product of approx. 910g of nicotine-coated wheat fibres with a nicotine content of approx. 3,8 weight-% based on the total weight of the nicotine-coated wheat fibres.

10 b) 600g wheat fibres (WF 200 provided as VITACEL by J.Rettenmaier & Söhne GmbH & Co KG, DE) are spray coated with 264g nicotine-in-glycerol solution (10 weight-% nicotine in glycerol, provided by Siegfried Ltd, CH) in a fluidized bed process.

The desired amount of nicotine-in-glycerol solution was successfully coated onto the wheat fibres to give a product of approx. 860g of nicotine-coated wheat fibres with a nicotine content of approx. 3,1 weight-% based on the total weight of the nicotine-coated wheat fibres.

15 c) 600g wheat fibres (WF 200 provided as VITACEL by J.Rettenmaier & Söhne GmbH & Co KG, DE) are spray coated with 450g nicotine-in-glycerol solution (10 weight-% nicotine in glycerol, provided by Siegfried Ltd, CH) in a fluidized bed process.

20 [0032] The desired amount of nicotine-in-glycerol solution was successfully coated onto the wheat fibres to give a product of approx. 1043g of nicotine-coated wheat fibres with a nicotine content of approx. 4,3 weight-% based on the total weight of the nicotine-coated wheat fibres.

25 **Example 2:** Manufacturing of a first filling material according to the invention for use in an oral pouched smokeless product

[0033] In an exemplary embodiment, a method is disclosed of manufacturing a filling material of the invention. Said method is based on mixing nicotine-coated non-tobacco plant material with further ingredients and tobacco material derived from tobacco stalk, tobacco root, tobacco flower or a combination thereof in order to form a filling material suitable for use in an oral pouched smokeless product.

30 [0034] An exemplary method for producing a batch of a filling material for use in an oral pouched smokeless product comprises the step of mixing the following ingredients:

35 135kg nicotine-coated wheat fibres of Example 1 a), b) or c);

6,5kg tobacco material (optionally pasteurized) derived from tobacco stalk, tobacco root, tobacco flower or a combination thereof, preferably non-bleached tobacco material;

78kg water;

10,4kg NaCl;

40 12,06kg ammonium chloride (20%);

1,18kg sodium carbonate;

5,6kg propylene glycol; and

optionally flavour.

45 [0035] All ingredients are added in a single vessel and mixed. The resulting filling material may be partitioned and packaged into oral pouched smokeless products.

50 **Example 3:** Manufacturing of a second filling material according to the invention for use in an oral pouched smokeless product

[0036] In an exemplary embodiment, a method is disclosed of manufacturing a filling material of the invention. Said method is based on mixing tobacco material derived from tobacco stalk, tobacco root, tobacco flower or a combination thereof with further ingredients in order to form a tobacco filling material suitable for use in an oral pouched smokeless product.

55 [0037] An exemplary method for producing a batch of a filling material for use in an oral pouched smokeless product comprises the step of mixing the following ingredients:

135kg tobacco material (optionally pasteurized) derived from tobacco stalk, tobacco root, tobacco flower or a combination thereof;

5 118kg water;

13.75kg NaCl;

5.98kg ammonium chloride (20%);

2.3kg sodium carbonate;

12.34kg propylene glycol; and

10 optionally flavour.

[0038] All ingredients are added in a single vessel and mixed. The resulting filling material may be partitioned and packaged into oral pouched smokeless products.

15 **Claims**

1. A filling material for use in an oral pouched smokeless product, the filling material comprising tobacco material, characterized in that the total tobacco material content of the filling material consists of tobacco material derived from tobacco stalks, tobacco roots, tobacco flowers or combinations thereof, preferably derived from tobacco stalks, tobacco roots or combinations thereof.

2. The filling material of claim 1, wherein the filling material is light-coloured.

25 3. The filling material according to anyone of the preceding claims, wherein the filling material comprises tobacco material in a concentration of 0,1 to 15 weight-%, preferably in a concentration of 0,1 to 10 weight-%, more preferably in a concentration of 2 to 8 weight-%, wherein indications in weight-% are based on the dry weight of the total filling material.

30 4. The filling material according to anyone of the preceding claims, wherein the tobacco material is non-bleached.

5. The filling material according to anyone of the preceding claims, wherein the filling material further comprises non-tobacco plant material.

35 6. The filling material according to claim 5, wherein the filling material comprises non-tobacco plant material in a concentration of 70 to 99 weight-%, wherein the indications in weight-% are based on the dry weight of the total filling material.

7. The filling material according to claims 5 or 6, wherein the non-tobacco plant material is coated with nicotine.

40 8. The filling material according to claim 7, wherein the nicotine-coated non-tobacco plant material has a nicotine content within the range of 0,1 to 10 weight-%, preferably of 1 to 5 weight-%, more preferably of 2,5 to 4,5 weight-%, wherein the indications in weight-% are based on the dry weight of the nicotine-coated non-tobacco plant material.

45 9. The filling material according to anyone of claims 5 to 8, wherein the non-tobacco plant material comprises or consists of fibres or particles from non-tobacco plants, preferably, the non-tobacco material comprises or consists of wheat fibres, oat fibres, potato fibres, bamboo fibres, buckwheat fibres, barley fibres, microcrystalline cellulose and/or combinations thereof.

50 10. The filling material according to anyone of the preceding claims, wherein the filling material comprises a water content of 25 to 55 weight-% based on the total weight of the filling material.

11. The filling material according to anyone of the preceding claims, the filling material containing further ingredients, wherein the further ingredients comprise stabilizers, humectants, plasticisers, thickeners, dyes, salts, flavours, gum base, flavour additives or any combination thereof, preferably comprise NaCl, NH₄Cl, Na₂CO₃, propylene glycol, optionally one or more flavours and/or combinations thereof.

55 12. The filling material according to anyone of the preceding claims, wherein the tobacco material is shredded, threshed,

cut, ground, cured, fermented, processed, pasteurized or reconstituted.

13. The filling material according to anyone of the preceding claims, wherein the filling material comprises or consists of:

- 5 0,1 to 15 weight-% tobacco material derived from tobacco stalks, tobacco roots, tobacco flowers or combinations thereof, preferably derived from tobacco stalks, tobacco roots or combinations thereof;
- 70 to 99 weight-% non-tobacco plant material, preferably nicotine-coated non-tobacco plant material; and
- 0 to 30 weight-% further ingredients;
- 10 wherein above-mentioned indications in weight-% are based on dry weight of the total filling material; and wherein the filling material has a water content of 25 to 55 weight-% based on the total weight of the filling material.

14. The filling material according to claim 13, wherein the filling material comprises or consists of:

- 15 2 to 6 weight-% tobacco material derived from tobacco stalks, tobacco roots, tobacco flowers or combinations thereof, preferably derived from tobacco stalks, tobacco roots or combinations thereof;
- 75 to 85 weight-% non-tobacco plant material, preferably nicotine-coated non-tobacco plant material;
- 3 to 9 weight-% NaCl;
- 20 4 to 10 weight-% ammonium chloride (20%);
- 0,3 to 1,2 weight-% sodium carbonate;
- 2 to 5 weight-% propylene glycol; and
- 25 optionally one or more flavours;
- wherein above-mentioned indications in weight-% are based on dry weight of the total filling material; and wherein the filling material has a water content of 25 to 55 weight-% based on the total weight of the filling material.

- 30 15. An oral pouched smokeless product comprising a filling material of one of claims 1 to 14.

35

40

45

50

55



EUROPEAN SEARCH REPORT

Application Number

EP 20 16 0696

5

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
10 X	US 2012/152265 A1 (DUBE MICHAEL FRANCIS [US] ET AL) 21 June 2012 (2012-06-21) * paragraph [0052] * * paragraph [0061] - paragraph [0062] * * paragraph [0065] * * example 1 *	1,3-6, 9-15 2,7,8	INV. A24B13/00 A24B15/16 A24B15/30
15 A	-----		
20 X	US 2013/276801 A1 (BYRD JR MEDWICK VAUGHAN [US] ET AL) 24 October 2013 (2013-10-24) * claims 1-14 * * paragraph [0084] * * examples 6-11 *	1,2,12 3-11, 13-15	
25 A	-----	1-15	
30 A	WO 2017/153718 A1 (BRITISH AMERICAN TOBACCO LTD [GB]; FIEDLER & LUNDGREN [SE]) 14 September 2017 (2017-09-14) * the whole document *	1-15	
35 A	-----	1-15	TECHNICAL FIELDS SEARCHED (IPC)
40 A	EP 3 330 191 A1 (SWEDISH MATCH NORTH EUROPE AB [SE]) 6 June 2018 (2018-06-06) * the whole document *	1-15	A24B
45	-----		
50 1	The present search report has been drawn up for all claims		
55	Place of search The Hague	Date of completion of the search 8 September 2020	Examiner Dimoula, Kerasina
EPO FORM 1503 03-82 (P04C01)			
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 20 16 0696

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

08-09-2020

	Patent document cited in search report		Publication date		Patent family member(s)	Publication date
10	US 2012152265	A1	21-06-2012	CN	103338661 A	02-10-2013
				EP	2651253 A1	23-10-2013
				ES	2616791 T3	14-06-2017
15				JP	6106598 B2	05-04-2017
				JP	2014501104 A	20-01-2014
				US	2012152265 A1	21-06-2012
				US	2019313690 A1	17-10-2019
				WO	2012083127 A1	21-06-2012
20	US 2013276801	A1	24-10-2013	CN	104582511 A	29-04-2015
				DK	2838382 T3	03-12-2018
				EP	2838382 A1	25-02-2015
				JP	6218807 B2	25-10-2017
25				JP	2015514882 A	21-05-2015
				PL	2838382 T3	31-05-2019
				US	2013276801 A1	24-10-2013
				US	2016227834 A1	11-08-2016
				WO	2013158957 A1	24-10-2013
30	WO 2017153718	A1	14-09-2017	CA	3016766 A1	14-09-2017
				EP	3426064 A1	16-01-2019
				JP	6725164 B2	15-07-2020
				JP	2019512219 A	16-05-2019
				US	2019124971 A1	02-05-2019
				WO	2017153718 A1	14-09-2017
35	EP 3330191	A1	06-06-2018	CA	3045529 A1	07-06-2018
				EP	3330190 A1	06-06-2018
				EP	3330191 A1	06-06-2018
				EP	3548385 A1	09-10-2019
				JP	2019536709 A	19-12-2019
40				KR	20190089170 A	30-07-2019
				US	2018153211 A1	07-06-2018
				US	2019291900 A1	26-09-2019
				WO	2018099843 A1	07-06-2018
45	WO 2010054198	A2	14-05-2010	CN	102481016 A	30-05-2012
				CN	103876272 A	25-06-2014
				EP	2352395 A2	10-08-2011
				EP	3479704 A1	08-05-2019
				HK	1171626 A1	21-08-2015
50				JP	6034824 B2	30-11-2016
				JP	2012508021 A	05-04-2012
				JP	2014168475 A	18-09-2014
				US	2010116281 A1	13-05-2010
				US	2012279510 A1	08-11-2012

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

55

page 1 of 2

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 20 16 0696

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
 The members are as contained in the European Patent Office EDP file on
 The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

08-09-2020

10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
15			US 2015013694 A1	15-01-2015
20			WO 2010054198 A2	14-05-2010
25				
30				
35				
40				
45				
50				
55	EPO FORM P0459			

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

page 2 of 2