(19) DANMARK

(10) **DK/EP 3437489 T3**

Patent- og
Varemærkestyrelsen

(12) Oversættelse af
europæisk patentskrift

(51) Int.Cl.: ***A 23 L 17/10 (2016.01)*** ***A 22 C 25/00 (2006.01)*** ***A 22 C 25/18 (2006.01)***
A 23 B 4/06 (2006.01) ***A 23 L 17/00 (2016.01)*** ***A 23 P 30/00 (2016.01)***
A 23 P 30/10 (2016.01) ***A 23 P 30/20 (2016.01)***

(45) Oversættelsen bekendtgjort den: **2021-01-11**

(80) Dato for Den Europæiske Patentmyndigheds
bekendtgørelse om meddelelse af patentet: **2020-12-02**

(86) Europæisk ansøgning nr.: **17774957.9**

(86) Europæisk indleveringsdag: **2017-03-27**

(87) Den europæiske ansøgnings publiceringsdag: **2019-02-06**

(86) International ansøgning nr.: **JP2017012423**

(87) Internationalt publikationsnr.: **WO2017170420**

(30) Prioritet: **2016-03-30 JP 2016069201**

(84) Designerede stater: **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**

(73) Patenthaver: **Nippon Suisan Kaisha, Ltd., 3-1, Nishi-shimbashi 1 chome, Minato-ku, Tokyo 105-8676, Japan**

(72) Opfinder: **OOBA, Takahiro, C/O Nippon Suisan Kaisha Ltd., Human Life Science R&D Center, 32-3 Nanakuni 1-chome, Hachioji-shi, Tokyo 192-0991, Japan**

(74) Fuldmægtig i Danmark: **Plougmann Vingtoft A/S, Strandvejen 70, 2900 Hellerup, Danmark**

(54) Benævnelse: **FREMGANGSMÅDE TIL FREMSTILLING AF FROSSET, HAKKET FISKEKØD**

(56) Fremdragne publikationer:
EP-A1- 0 724 845
FR-A1- 2 767 031
GB-A- 2 371 969
JP-A- H07 250 614
JP-A- H10 327 745
JP-A- S58 101 641
JP-A- 2005 305 404
JP-A- 2009 017 868
RU-C1- 2 084 186
Anonomous: "CO Â·OP Osakana no Parapara Minchi", Coopnet, 6 July 2017 (2017-07-06), pages 1-2, XP055578871, Retrieved from the Internet: URL:http://www.coopnet.jp/ product/osusume coop/2016/201601.html
Anonomous: "Meat Chopper", endoshoji , 15 May 2015 (2015-05-15), XP055578876, Retrieved from the Internet: URL:http://www.endoshoji.co.jp/QA/QA/CMC11 .html [retrieved on 2017-06-08]
Anonomous: "Tsukutta Parapara Minchi ga Shin Tojo shimashita*", Osakana Dake Tsukutta Parapara Minchi ga Shin Tojo shimashita*, 14 November 2016 (2016-11-14), XP055578880, Retrieved from the Internet:

Fortsættes ...

URL:https://community. coopdeli.jp/article/blog/inf/3519 [retrieved on 2017-06-07]

DESCRIPTION

TECHNICAL FIELD

[0001] The present invention relates to a method of producing a frozen product of minced fish meat frozen into granules like minced livestock meat,

BACKGROUND ART

[0002] As one of the reasons that the consumption of fish meat does not grow as compared to livestock meat, there is given the reason that it takes time and effort and is cumbersome to cook fish meat due to presence of bones and internal organs. There has hitherto been a desire that fish meat be provided in a shape that can be used easily even in a small amount as in minced livestock meat. However, fish meat and livestock meat are different from each other in composition and physical properties. Fish meat is physically brittle. The fibers of fish meat are fine. The content of oils and fats in fish meat is small, however, an oxidative stability of fish oil is low. Thus, for various reasons, fish meat having a shape that can be used easily even in a small amount has not been put to practical use.

[0003] In Patent Literature 1, there is disclosed a method of producing minced food frozen into granules, including: mincing a material that has tackiness at normal temperature when minced while keeping an article temperature of from 0°C to -10°C; and stirring and freezing the minced material while keeping a temperature of -10°C or less. In Example, there is disclosed that beef meat is minced, and the minced meat is frozen into granules with snowy dry ice.

[0004] In Patent Literature 2, there is disclosed a method of freezing food, including: mincing food while keeping an article temperature of from 0°C to -10°C; and stirring and freezing the minced food into granules while keeping a temperature of -10°C or less. In the disclosed method, at a time of conveying minced food with a conveyor and supplying the minced food to an inside of a rotary drum through an inlet, dry ice snow is supplied to the minced food or to both the minced food and the inside of the rotary drum, and a mixture of the food and the dry ice snow is stirred in the rotary drum, to thereby obtain a product frozen into granules.

CITATION LIST

PATENT LITERATURE

[0005]

[PTL 1] JP-A-58-101641

[PTL 2] JP-A-07-250614

SUMMARY OF INVENTION

TECHNICAL PROBLEM

[0006] An objective of the invention is to produce a frozen product of minced fish meat which is frozen into granules like minced livestock meat with good quality by a simple method.

SOLUTION TO PROBLEM

[0007] In order to provide a frozen product of minced fish meat at low cost by a simple method, the inventor of the invention has attempted various methods. As a result, the inventor of the invention has found that a frozen product of minced fish meat of good quality can be obtained by carefully selecting a raw material and elaborating the usage of a meat chopper (meat mincer) to be used for livestock meat.

ADVANTAGEOUS EFFECTS OF INVENTION

[0008] The method of the invention enables the production of frozen fish meat frozen into granules with satisfactory quality in which the content of small meat pieces having a semicolumnar shape, a flake shape, or an incomplete shape such as a chip, instead of an original columnar shape, is small. The frozen fish meat frozen into granules of the invention can be distributed in a cold chain at a temperature of from about -30°C to about -15°C, and the quality thereof can be kept for a period of from about 6 months to about 12 months.

BRIEF DESCRIPTION OF DRAWINGS

[0009]

FIG. 1 is a schematic view for illustrating a structure of a meat mincer.

FIG. 2 is a photograph of a product which is obtained when the rotation number of each of a plate knife and a feed screw is set to 121 rpm in an example.

FIG. 3 is a photograph of a product which is obtained when the rotation number of each of the plate knife and the feed screw is set to 162 rpm in an example.

FIG. 4 is a photograph of a product which is obtained when the rotation number of each of the plate knife and the feed screw is set to 203 rpm in an example.

FIG. 5 is a photograph of a product which is obtained when the rotation number of each of the plate knife and the feed screw is set to 243 rpm in an example.

DESCRIPTION OF EMBODIMENTS

[0010] The invention relates to a method of producing minced fish meat frozen into granules

[0011] As fish meat to be used, any fish meat can be used, but fish species having solid muscle is preferred. Specifically, there are given Siluriformes (American catfish, Pangasius, etc.), Salmoniformes (coho salmon, sockeye salmon, etc.), Gadiformes (Alaska pollack, blue grenadier, common hake, etc.), Clupeiformes (anchovy, pilchard, etc.), Beloniformes (saury, flying fish, etc.), Beryciformes, Synbranchiformes (flathead, sablefish, etc.), Perciformes (tuna, yellowtail, goatfish, Nile tilapia, cobia, horse mackerel, hairtail, southern mackerel, bonito, red sea bream, golden threadfin bream, croaker, etc.), Pleuronectiformes (flatfish, halibut, Greenland halibut, etc.), and the like. Fish meat having skin, internal organs, bones, and the like removed therefrom is used. Raw fish meat that is directly frozen, a fish block obtained by subjecting raw fish meat to block freezing, frozen ground fish meat obtained by grinding raw fish meat and freezing the ground raw fish meat, or the like can be used as a raw material. When fish meat is directly used, minced meat keeping taste and flavor of the fish meat can be produced. When frozen ground fish meat is used as a raw material, versatile minced fish meat, which is excellent in preserving property and has less color and smell, can be produced. White-fleshed fish and salmon or trout are suitable for frozen storage from the viewpoint of color and smell as compared to lean fish.

[0012] The frozen ground fish meat (surimi) of white-fleshed fish is obtained by collecting fish meat of codfishes such as Alaska pollack (Theragra chalcogram) and southern blue whiting (Micromesistius australis) which belong to Gadiformes (Gadidae) and blue grenadier (Macruronus magellanicus) which belongs to Gadiformes (Macruronidae) or lizardfishes such as lizardfish (Saurida sp.) which belongs to Aulopiformes (Synodontidae), putting the fish meat in water, dehydrating the fish meat, and freezing the fish meat. In many cases, a freezing denaturation inhibitor such as salts or sugars is added to the fish meat, and then the fish meat is frozen to be distributed.

[0013] The frozen block of raw fish is generally obtained by packing fish meat having a head, internal organs, skin, bones, and the like removed therefrom into a freezing pan and frozen in a block shape.

[0014] The frozen minced fish meat is produced by the method according to the invention as described below.

[0015] The temperature of frozen ground fish meat or a frozen block of fish meat is raised to a temperature of from -10°C to -5°C in a refrigerator. The temperature of -10°C or less is not preferred because the fish meat becomes excessively hard. The temperature of -5°C or more is not preferred because the temperature of the fish meat rises excessively when being taken out from a meat mincer, with the result that minced fish meat granules adhere to each other. The fish meat is shredded to a size suitable for being loaded into the meat mincer with a band saw, a silent cutter, or the like. Depending on the kind and the size of the meat mincer, the fish meat is cut to a cubic shape measuring from about 3 cm to about 5 cm per side or a bar shape having a cross section measuring from about 3 cm to about 5 cm per side. In the case of the silent cutter, the fish meat is stirred until the fish meat has a size close to the above-mentioned size. During shredding, the temperature is also maintained at a temperature of from -10°C to -5°C so that the temperature of the fish meat does not rise.

[0016] The shredded fish meat is loaded into the meat mincer to obtain minced fish meat. As the meat mincer, any meat mincer used for livestock meat may be used. The meat mincer is a device having a structure of extruding fish meat through holes each having a certain diameter. In general, as illustrated in a schematic view of FIG. 1, the meat mincer has a structure including a feed screw configured to push meat into the device, a plate having holes each having a certain diameter, and a plate knife configured to cut fibers of the meat by rotating in front of the plate. There is a type further including a charging screw configured to supply fish meat to the feed screw.

[0017] Feed balance between the feed screw and the charging screw is important when the frozen fish meat is loaded into the meat mincer. The frozen meat includes frozen lumps, and hence gaps are liable to be formed between the lumps. When there are gaps between the lumps, a mixing ratio of minced fish meat having a chip shape with a half size of the hole of the plate instead of the shape filling the entire surface of the hole of the plate, frozen fish meat having a flake shape instead of a columnar shape, and the like increases. In particular, when minced meat formed of large granules, such as coarsely minced meat, is produced through use of a plate having large holes, there arises a problem. It is required to adjust the feed amount of the charging screw to be larger than that of the feed screw.

[0018] The rotation speed of the plate knife is more important. The plate knife is generally coupled to the feed screw, and hence the plate knife rotates at the same speed as that of the feed screw. The production efficiency can be enhanced by increasing the speed of the feed screw. However, it has been found that this increase in speed of the feed screw increases the occurrence rate of meat granules each having an incomplete shape. Specifically, the occurrence of meat granules each having an incomplete shape can be reduced by setting the rotation speed of the plate knife to 165 rpm or less, more preferably 130 rpm or less. As described in the Examples, the amount of meat granules each having an incomplete shape

can be reduced to 10 wt% or less by limiting the speed of the plate knife.

[0019] Further, in many cases, the plate knife and the feed screw are not fixed to each other, and a certain clearance is secured therebetween with a spring. When this clearance becomes larger, the occurrence rate of meat granules each having an incomplete shape increases. Therefore, the clearance is adjusted to substantially 0 mm.

[0020] The frozen minced fish meat produced by the above-mentioned method includes meat granules having a semicolumnar shape, a flake shape, or a threadlike incomplete shape, instead of a substantially columnar shape, the content of the meat granules being 10 wt% or less, preferably 7 wt% or less, more preferably 5 wt% or less, and meat granules having a substantially columnar shape with a diameter of the hole of the plate, specifically, a diameter of from 3 mm to 7 mm, the content of the meat granules being 90 wt% or more. Thus, the frozen mince fish meat has good quality in which meat granules each having an incomplete shape are not prominent. The substantially columnar shape as used herein encompasses a complete columnar shape or a distorted complete columnar shape and excludes a shape having a short diameter distorted to 2 mm or less, a shape of a meat granule extruded in an incomplete shape having a short diameter of 2 mm or less without originally having a columnar shape, and the like.

[0021] The product of the invention is a product that is not heated before freezing and is food that is eaten after being heated at a time of ingestion. However, the product of the invention is formed of raw fish meat and has a large surface area, and hence it is required to also take bacterial contamination and the like into consideration. In general, it is required to use a raw material having a bacterial count of 10^6 or less, preferably 10^4 or less in a stage of frozen fish meat of the raw material. A production process is performed at low temperature, and hence bacteria do not grow.

[0022] Further, when frozen ground fish meat or frozen picked fish meat is used as a raw material, it is preferred to use the frozen ground fish meat or the frozen picked fish meat having a moisture amount of 76 wt% or less. Ground fish meat or picked fish meat, which is properly dehydrated so as to have a moisture amount reduced to be small, has a high protein content and is less liable to be subject to bacterial contamination. Further, because of the small moisture amount, minced fish meat is properly hard, and hence the shape thereof is kept.

[0023] An antioxidant, a preserving agent, and the like may be added to the fish meat. The antioxidant, the preserving agent, and the like can be added to the fish meat by mixing, spraying, or the like in a stage in which the fish meat is in a state of ground fish meat, a stage in which the fish meat is cut before being minced, or after the fish meat is minced. After being minced, the fish meat can also be mixed with another frozen food as long as the fish meat is refrozen.

[0024] Now, the Examples of the invention are described, but the invention is not limited thereto.

Example 1 (comparative)

[0025] A ground fish meat block of Alaska pollack (Unisea, Inc., A grade, moisture content: 73.9 g/100 g, containing 8 wt% in total of sugar and sorbitol) was cut to a size measuring about 4 cm per side with a freezing band saw and stored at a temperature of from -10°C to -8°C. The resultant was extruded into a minced state through use of a meat mincer (Meat grinder #42 GM-P4 manufactured by Nippon Career Industry, plate (plate diameter: 3.2 mm), one-stage mincing, clearance (gap) between a plate knife and a feed screw was adjusted to 0 mm). The temperature at a time of extrusion was from -3°C to -2°C. The resultant was refrozen until the center temperature reached -18°C or less in a freezer at -25°C or less. The minced meat granules partially adhere to each other at a time of refreezing, and hence the refrozen minced fish meat was crushed into granules with a crusher ("Parapara-minchi-seizouki" a meat mincer manufactured by Iwata Food Co., Ltd.) to be packed into a bag.

[0026] The operation condition of a plate cutter and the feed screw of the meat mincer was changed to 121 rpm, 162 rpm, 203 rpm, and 243 rpm to produce frozen minced fish meat.

[0027] The results are shown in Table 1 and FIG. 2 to FIG. 5. As shown in Table 1, as the rotation speed was increased, the occurrence rate of meat granules each having an incomplete shape became higher. Photographs are illustrated in FIG. 2 to FIG. 5.

[0028] The general bacteria count of a raw material is 10^4 or less (2.3×10^3), and the bacteria count of the minced fish meat produced through the above-mentioned steps was also 10^4 or less (4.0×10^3).

[0029] When the minced fish meat was fried on a frying pan having oil spread thereon, the minced fish meat was heated into a granular shape as in the case of general minced livestock meat and was able to be used as a material for various dishes.

Table 1

Rotation speed (rpm)	Rate (wt%) of complete shape (substantially columnar shape)
121	96.9
162	92.4
203	81.4
243	78.3

Example 2

[0030] Frozen minced fish meat was produced through use of a fish block of Alaska Pollack and a fish block of salmon as materials. The same method as that of Example 1 was used. The temperature at a time of extrusion was maintained at -5°C or less. The operation condition of a plate cutter and a feed screw of a meat mincer was set to 162 rpm (40 Hz).

[0031] The rate of a complete shape was counted in the same manner as in Example 1 to be 98.6% in the case of using the fish block of Alaska Pollack and 95.8% in the case of using the fish block of salmon. Thus, good results were obtained even when any of those raw materials was used.

Example 3

[0032] Results of component analysis of the frozen minced fish meat produced in Example 1 and Example 2 are shown in Table 2.

Table 2

(/100 g)	Example 1	Example 2 (Alaska Pollack)	Example 2 (Salmon)
Moisture	73.9 g	82.5 g	76.5 g
Protein	17.3 g	15.9 g	20.1 g
Fat	0.4 g	0.8 g	2.2 g
Carbohydrate	7.7 g	0 g	0 g
Ash	0.7 g	0.8 g	1.2 g
Calorie	104 kcal	71 kcal	100 kcal
Sodium	142 mg	95.8 mg	137 mg
Salt equivalent	0.4 g	0.2 g	0.3 g

INDUSTRIAL APPLICABILITY

[0033] The frozen minced fish meat produced by the method of the invention can be used easily in an appropriate amount as necessary as in the case of minced livestock meat. Therefore, the problem that it takes time and effort to cook fish meat is solved, and versatile easy-to-use fish meat foodstuff can be provided.

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in

compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP58101641A [0005]
- JP7250614A [0005]

Patentkrav

1. Fremgangsmåde til fremstilling af hakket fiskekød frosset til granulater, hvilken fremgangsmåde omfatter:

a) at hæve temperaturen af fiskekød (råvare) som er blevet frosset ved -20°C eller lavere til en temperatur på fra -10°C til -5°C;

b) at hakke fiskekødet mens temperaturen af fiskekødet holdes ved en temperatur på fra -10°C til -5°C under anvendelse af en kødhakker med en fødesnegl, en plade og en pladekniv ved en omdrejningshastighed på 165 omdrejninger pr. minut eller lavere for pladekniven, og kødhakkeren holder en afstand (mellemrum) mellem pladekniven og fødesneglen på kødhakkeren på i alt væsentligt 0 mm, inden fiskekødet hakkes;

c) at nedkøle det hakkede fiskekød til -20°C eller lavere; og

d) at knuse det hakkede fiskekød frosset ved -20°C eller lavere til granulater.

2. Fremgangsmåden ifølge krav 1, hvor råvaren har et bakterietal på 10^6 eller mindre, fortrinsvis 10^4 eller mindre, i et stade hvor råvaren er frosset fiskekød.

3. Fremgangsmåden ifølge kravene 1-2, hvor frosset formalet fiskekød eller frosset pillet fiskekød, når det anvendes som råvaren, har et fugtindhold på 76 vægtprocent eller mindre.

4. Fremgangsmåden ifølge et hvilket som helst af kravene 1-3, hvor en fiskeblok, frosset formalet fiskekød eller frosset pillet fiskekød anvendes som fiskekødsråvare.

DRAWINGS

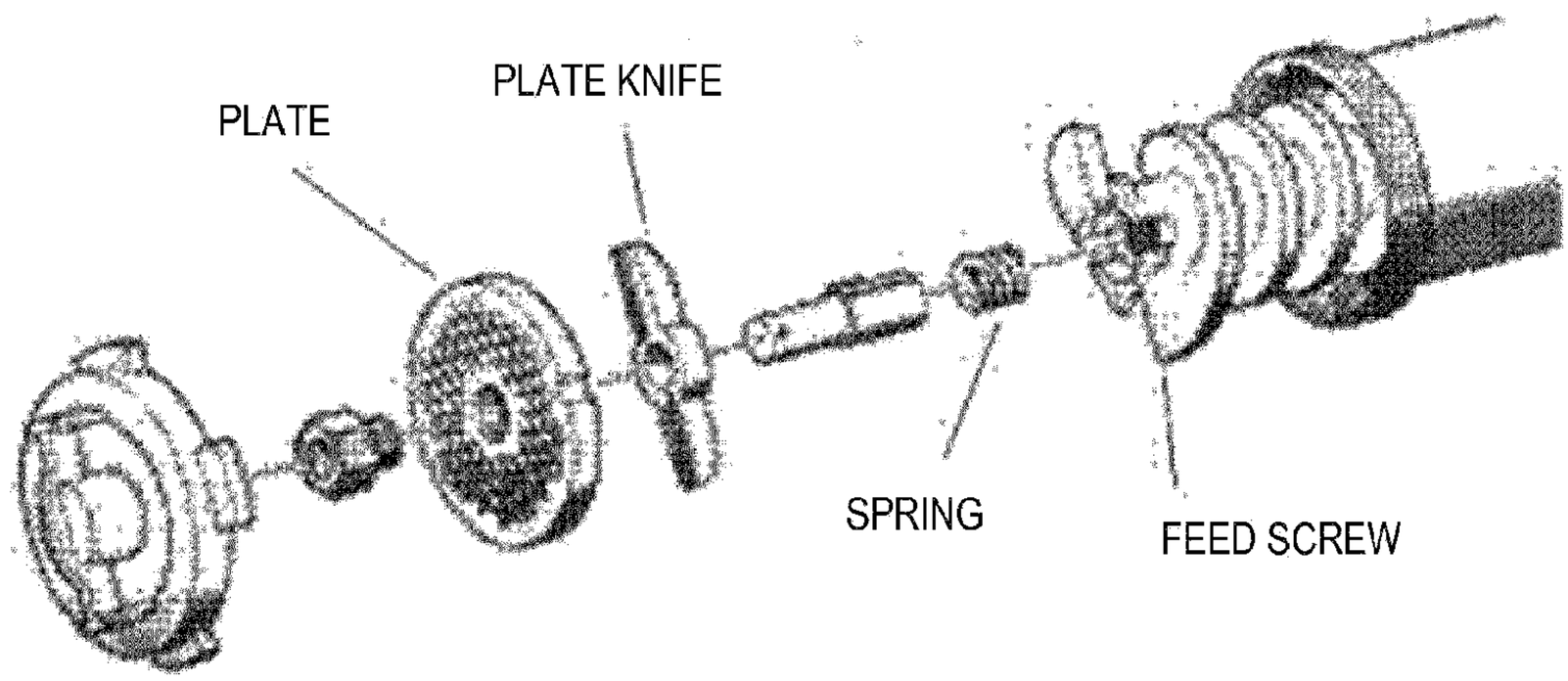


FIG. 1



FIG. 2

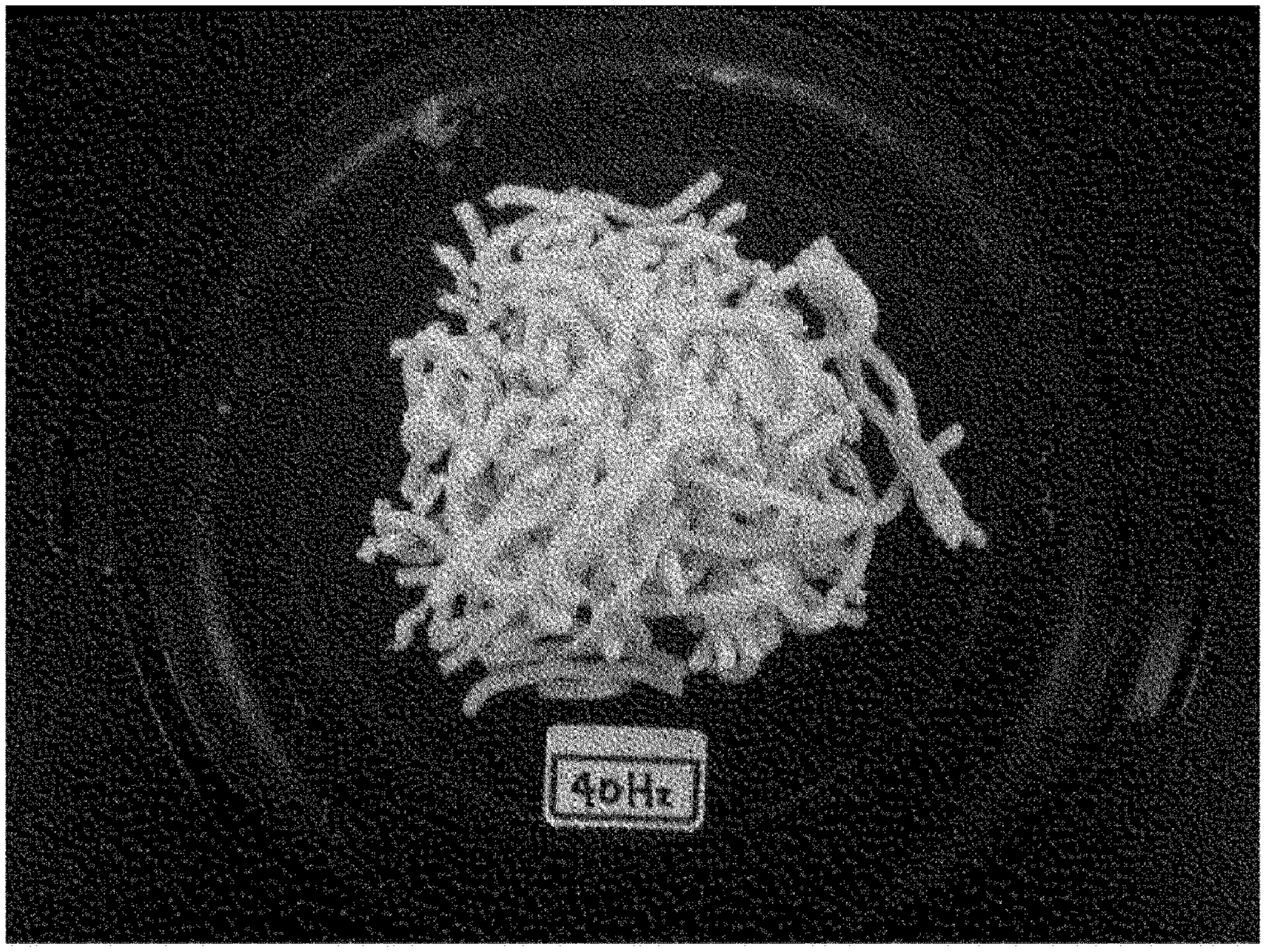


FIG. 3



FIG. 4



FIG. 5