New connection on: : 23-02-2018 : 06:30:43 - Last disconnection on: : 23-02-2018 : 00:32:39

V 4.0.0.44358(LP,U,linux) (Rev:43856 2017-04-27 09:03:29 +0200#(D201802)) (RPM D201802)

Welcome to EPOQUE Rebuild under the Production Environment

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Database: EPODOC

[EPODOC: SS 1] (container or vessel or receptacle or recipient or mold) and (ice 1d spher+)

Results in EPODOC **42**

[SS 2] * and PD<2017-08-02

Results in EPODOC **41**

[SS 3] ..li

1/41 © EPODOC / EPO

PN - KR20170039872 A 20170412

PR - KR20150138974 20151002

AP - KR20150138974 20151002

DT - I

PA - VITZROTECH CO LTD [KR]

TI - PROCESS FOR MANUFACTURING FLEXIBLE **MOLD** AND PROCESS FOR PRODUCING ICE BALL

AB - The present invention relates to a method for manufacturing a flexible **mold**, and a method of producing **spherical ice**, whereby a **mold** for producing nanoscale **spherical ice** can be conveniently manufactured using silicone as the main material, and the flexible molds thus prepared can be used to rapidly and conveniently produce nanoscale **spherical ice**. The method of producing **spherical ice** of the present invention comprises: a step for preparing a liquid material for forming a **mold** which offers flexibility when cured; a step for inserting a core material inside the liquid material for forming a **mold**; a step for curing the liquid material for forming a **mold** to form a solid base material; a step for cutting a part of the base material to isolate and discharge the core material therefrom and thereby form a core cavity; a filling step for filling water into the core cavity through the part of the base material cut in the previous step; a cooling step for cooling the flexible **mold** having the core cavity filled with water by keeping the same at a temperature below zero for a fixed time; and an ejection step for

ejecting a **spherical ice** from the core cavity through the cut part of the flexible **mold** in an environment in which the temperature is maintained below zero.

2/41 © EPODOC / EPO

PN - CN106423094 A 20170222

PR - CN20161849732 20160924

AP - CN20161849732 20160924

DT - I

CNOI - B01J20/28014 ; B01J20/04 ; B01J20/046 ; B01J20/22 ; B01J20/261 ; B01J20/262 ; C02F1/28 ; C02F1/285 ; B01J20/0288

CNOA - C02F1/281 ; B01J2220/46 ; C02F2101/38 ; B01J2220/4806 ; B01J2220/4812

PA - BEIJING YIJING ENV PROT EQUIPMENT TECH CO LTD

TI - Function board for adsorbing carbazole and preparation method thereof

AB - The invention discloses a function board for adsorbing carbazole and a preparation method thereof. The preparation method comprises the following steps: preparing a mixed solution B from 2-piperidone, 4-(1H-imidazol-1-yl)benzoic acid, milliliters of N,N-dimethylformamide, polyvinyl acetate and 2-mercaptobenzothiazole; preparing a mixed solution D from nitrile polyisoprene, N,N-dimethylformamide and 2,4-dimethylquinoline-3-carboxylate; preparing a mixed solution F from dibenzoyl peroxide, chloroform, N-hydroxy-isobutyramide, KNO3 and calcium chloride; preparing a mixed solution H from the mixed solution B, the mixed solution D, the mixed solution F, methyl isobutyrate, polyethylene glycol and chloroform; spraying distilled water into a **container** with liquid nitrogen to produce **ice spherical** particles, and compacting the **ice spherical** particles with particle sizes of 50 to 100[mu]m in a die cavity of a die; pouring the mixed solution H into the die, performing freezing shaping for 6 hours in the liquid nitrogen, performing vacuum freeze drying, and removing the chloroform and the **ice spherical** particles to obtain the function board for adsorbing the carbazole.

3/41 © EPODOC / EPO

PN - US2017030624 A1 20170202

PR - US201615292637 20161013; US201213713160 20121213

AP - US201615292637 20161013

DT - **

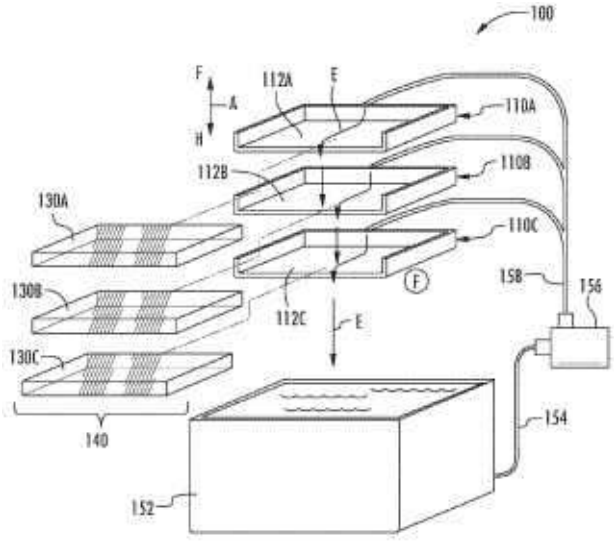
CT - || R141 (A1) US4580410 A 19860408 [ ] (TOYA CHIYOSHI [JP])

CCI - F25C1/12 ; F25C1/18 ; F25C5/14

PA - WHIRLPOOL CO [US]

TI - MULTI-SHEET **SPHERICAL ICE** MAKING

AB - An ice maker is provided herein that includes an evaporator plate. A first side of the



evaporator plate is adapted to form a first clear ice sheet and a second side of the evaporator plate is adapted to form a second clear ice sheet. A staging area is arranged downstream from the evaporator plate and adapted to receive the first and second clear ice sheets after formation. The first and second clear ice sheets are fused in the staging area to form a unitary ice sheet. A first **mold** assembly having a first **mold** form and a second **mold** assembly having a second **mold** form are positioned within the staging area on opposite sides of the unitary ice sheet when the unitary ice sheet is received in the staging area. A **mold** cavity is adapted to shape the unitary clear ice sheet to form one or more clear ice structures.

4/41 © EPODOC / EPO

PN - KR20160109213 A 20160921

PNFP - KR101763245B B1 20170814

PR - KR20150033231 20150310

AP - KR20150033231 20150310

DT - I

CNOI - (A)
A23G9/045 ; A23G9/221 ; A23G9/225 ; A23G9/32 ; B65D81/18

PA - (A)
JEONG SEUNG EUN [KR]

TI - (A B1)
CONTAINER FOR MAKING ICE CANDY AND METHOD FOR MAKING ICE CANDY USING THEREOF

AB - (A)
The present invention relates to a **container** for producing ice cream, and to a method for producing ice cream using the same. According to the present invention, the **container** for producing ice cream comprises: an ice making **container** including a semi-**spherical ice** making cavity capable of accommodating a liquid raw material at one lateral side; and a heat absorption member covering the other lateral side of the ice making **container** so as to create a temperature of the ice making cavity below the freezing point of the liquid raw material.

5/41 © EPODOC / EPO

PN - **CA2883735** A1 20160903

PR - CA20152883735 20150303

AP - CA20152883735 20150303

DT - *; Rep

CCI - **F25C1/22**

PA - NANTHAKUMARNISANTHAN[CA]

TI - **MOLD** FOR **SPHERICAL** SHAPED **ICE**

6/41 © EPODOC / EPO

PN - **KR20150134814** A 20151202

PR - KR20140062099 20140523

AP - KR20140062099 20140523

DT - I

PA - KIM DAE YOUNG [KR]

TI - A ICE BALL MANUFACTURING UNIT

AB - The present invention relates to an ice ball manufacturing device having an ice rotation removal function, a manufacturing method thereof, and an ice ball manufactured by the same, wherein the ice rotation removal function generates the ice ball using an ice manufacturing **container** and easily rotates and removes the ice by properly using an ice gripping device and a rotation device in a step of removing the ice ball from the ice manufacturing **container**. The ice ball manufacturing device includes: a semi-sphere (10) having a cooling line (11) and a heating line (12) on the surface and generating semi-**spherical ice** after being filled with water; the ice manufacturing **container** (20) on which the semi-sphere is mounted; a gripping unit (30) partially inserted into the semi-sphere and combined with the ice when the ice is generated in the semi-sphere; a guide rod (40) extended from the gripping unit and inducing the generation of **sphere**-shaped **ice** by rotating the semi-**spherical ice** at 180 degrees while the semi-**spherical ice** is gripped and by generating the rest of the semi-**spherical ice**; a semi-**spherical ice** moving unit (50) connected to the guide rod and inducing the generation of the semi-**spherical ice** by rotating the gripping unit at 180 degrees by providing power of moving the guide rod, and making the water into the ice after temporarily locating the semi-**spherical ice** on the water; a rotation unit (60) for removal, which is connected to the gripping unit and used to remove the ice by rotating at 180 degrees around the semi-sphere; a water supply device (70) supplying the water to the semi-sphere; and a control unit totally controlling the semi- **spherical ice** moving unit, the rotation unit for removal, the water supply device, the cooling line, and the heating line.

7/41 © EPODOC / EPO

PN - **KR20150134813** A 20151202

PR - KR20140062098 20140523

AP - KR20140062098 20140523

DT - I

CCA - **Y02P80/156**

PA - KIM DAE YOUNG [KR]

TI - A ICE BALL MANUFACTURING UNIT

AB - The present invention relates to an ice ball manufacturing device in a method of removing ice by rotating an ice manufacturing **container**, a manufacturing method thereof, and an ice ball manufactured by the same, wherein the ice ball manufacturing device generates an ice ball by using an ice manufacturing **container** and removes the ice ball by rotating or reversely rotating the ice manufacturing **container** in a step of removing the ice ball from the ice manufacturing **container**. The ice ball manufacturing device comprises: a semi-sphere (10) having a cooling line and a heating line (12) on the surface and generating the semi-**spherical ice** after being filled with water; the ice manufacturing **container** (20) wherein the semi-sphere is mounted; a gripping unit generating the rest of the semi-**spherical ice** by rotating the ice at 180 degrees while gripping the semi- **spherical ice** and inducing generation of **sphere**-shaped **ice**; a first rotation power supply unit (40) transmitting rotation power to the gripping unit; a water supply unit (50) for supplying the water to the semi-sphere; a left and right moving power unit (60) enabling the first rotation power supply unit to reciprocate from side to side and be inserted into or be drawn out from an ice manufacturing area; an ice manufacturing **container** moving unit removing the ice ball by rotating the ice manufacturing **container** at 180 degrees and enabling the ice ball to face the bottom; and a control unit (80) for controlling the water supply unit, a heating unit, the first rotation power supply unit, the left and right moving power unit, and the ice manufacturing **container** moving unit.

8/41 © EPODOC / EPO

PN - KR20150134809 A 20151202

PR - KR20140062091 20140523

AP - KR20140062091 20140523

DT - I

CNOI - F25C5/00 ; F25C5/02 ; F25C5/08 ; F25C1/25

PA - KIM DAE YOUNG [KR]

TI - A ICE BALL MANUFACTURING UNIT

AB - The present invention relates to an ice ball manufacturing device having an ice rotation removal function, a manufacturing method, and an ice ball manufactured by the same, wherein the ice ball manufacturing device generates an ice ball by using an ice manufacturing **container** and easily rotates and removes ice by properly using an ice gripping device and a rotation device in a step of removing the ice ball from the ice manufacturing **container**. The ice ball manufacturing device comprises: a semi-sphere unit (10) having a cooling line (11) and a heating line (12) on the surface and generating ice of a semi-sphere shape after being filled with the water; the ice manufacturing **container** (20) on which the semi-sphere unit is mounted; a gripping unit (30) partially inserted into the semi-sphere unit and combined with the ice when the ice is generated in the semi-sphere unit; a guide rod (40) extended from the gripping unit and guiding generation of the ice of a sphere shape by rotating the gripped ice of the semi-sphere shape and generating the rest of the ice of a semi-sphere shape; a semi-**sphere ice** moving unit (50) connected to the guide rod and guiding the ice to be in the sphere shape by making the ice of water after temporarily positioning the ice of the semi-sphere shape on the water by rotating the gripping unit by providing power to

move the guide rod; a water supply unit (60) supplying the water to the semi-sphere unit; and a control unit (70) controlling the generation and removal of the ice by totally controlling the semi- **sphere ice** moving unit, the water supply unit, the cooling line and the heating line.

9/41 © EPODOC / EPO

PN - KR20150134808 A 20151202

PR - KR20140062090 20140523

AP - KR20140062090 20140523

DT - I

CNOI - F25C1/142 ; F25C5/00 ; F25C5/08

PA - KIM DAE YOUNG [KR]

TI - A ICE BALL MANUFACTURING UNIT

AB - The present invention relates to a device and a method for manufacturing an ice ball using a method of removing ice by rotating an ice manufacturing **container**, and an ice ball manufactured by the same, wherein the device for manufacturing an ice ball generates the ice ball using the ice manufacturing **container** and removes the ice ball by rotating or reversely rotating the ice manufacturing **container** to remove the ice ball from the ice manufacturing **container**. The device for manufacturing an ice ball comprises: a semi-sphere (10) having a cooling line (11) and a heating line (12) on the surface and generating ice of a semi-sphere shape after being filled with water therein; the ice manufacturing **container** (20) on which the semi-sphere is mounted; a gripping unit (30) generating the rest of the ice of the semi-sphere shape by rotating the ice of the semi-sphere shape while gripping the ice and guiding the generation of the ice of a sphere shape; a first rotation power supply unit (40) for transmitting rotation power to the gripping unit; a water supply unit (50) for supplying the water to the semi-**sphere**; an **ice** manufacturing **container** moving unit (60) rotating the ice manufacturing **container** and removing the ice ball by guiding the ice ball to face the bottom; and a control unit (70) controlling the water supply unit, the heating line, the first rotation power supply unit, and the ice manufacturing **container** moving unit.

10/41 © EPODOC / EPO

PN - KR20150134807 A 20151202

PR - KR20140062089 20140523

AP - KR20140062089 20140523

DT - I

CNOI - F25C1/10 ; F25C5/00 ; F25C5/08

PA - KIM DAE YOUNG [KR]

TI - A ICE BALL MANUFACTURING UNIT

AB - The present invention relates to an ice ball manufacturing device manufacturing an ice ball in a continuous work method, a manufacturing method thereof, and an ice ball manufactured by the same and, specifically, to an ice ball manufacturing device manufacturing an ice ball in a continuous work method, wherein the ice ball manufacturing device continuously generates an ice ball by generating a **spherical ice** ball using a rotation device while a set of two holes is prepared, and a manufacturing

method thereof, and an ice ball manufactured by the same. The ice ball manufacturing device comprises: a first semi-sphere (10) having a cooling line and a heating line on the surface and generating a semi-**spherical ice** ball after being filled with water; a second semi-sphere (20) formed in the same form as the first semi-sphere and having the cooling line and the heating line on the surface, wherein the second semi-sphere generates the semi-**spherical ice** after being filled with the water; an ice manufacturing **container** (30) generating a **spherical ice**, wherein the first semi-sphere and the second semi-sphere are individually arranged thereon; a gripping unit (40) inducing generation of a **spherical ice** by rotating the semi-**spherical ice** at 180 degrees while gripping the semi-**spherical ice** when the ice is generated in the first semi-sphere and generating the rest of the semi-**spherical ice**; a rotation power supply unit (50) for transmitting rotation power to the gripping unit; a heating unit (60) formed in the gripping unit and used to separate the ice to the outside; a water supply unit (70) for filling the semi-sphere with the water; and a control unit (80) electrically connected to the rotation power supply unit, the water supply unit, the cooling line, the heating line, and the heating unit and controlling the same.

11/41 © EPODOC / EPO

PN - US2015027142 A1 20150129

PNFP - US9784492 B2 20171010

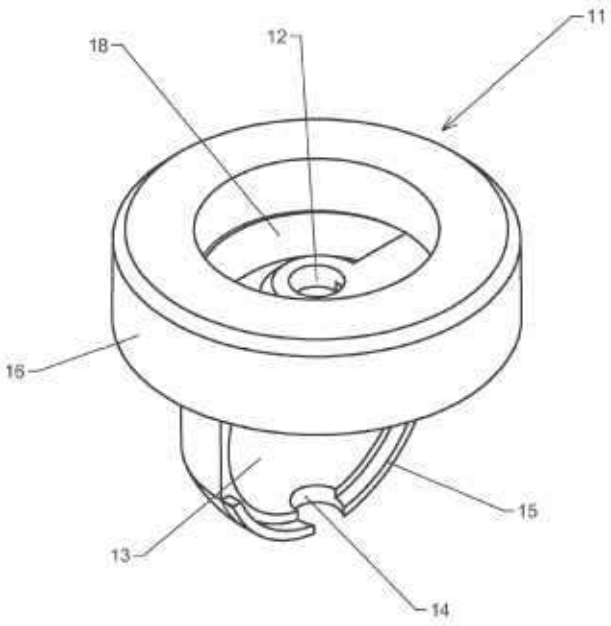
PR - US201414309480 20140619; US201361857608P 20130723

AP - US201414309480 20140619

DT - *; Rep

CT - || R141 (A1)
US6357720 B1 20020319 [ ] (SHAPIRO ANDREW PHILIP [US], et al);
US9273891 B2 20160301 [ ] (BOARMAN PATRICK J [US], et al);
US6857277 B2 20050222 [ ] (SOMURA KATSUZO [JP]);
US2009152438 A1 20090618 [ ] (CHU YUE-LONG [TW])

- || STSE (B2)
US6357720 B1 20020319 [ ] (SHAPIRO ANDREW PHILIP [US], et al);
US6857277 B2 20050222 [ ] (SOMURA KATSUZO [JP]);
US9273891 B2 20160301 [ ] (BOARMAN PATRICK J [US], et al);
US2009152438 A1 20090618 [ ] (CHU YUE-LONG [TW])



CCI - **F25C1/18** ; **F25C1/22**

CCA - **F25D2500/02**

PA - (A1)
LITTLE PATRICK WILLIAM [US];
LITTLE CHRISTOPHER WILLIAM [US]
- (B2)
WINTERSMITHS LLC [US]

TI - (A1)
Device and Method for Producing Clear **Ice Spheres**
- (B2)
Device and method for producing clear **ice spheres**

AB - (A1 B2)
Exemplary embodiments of a device and method for making clear **ice spheres** employing a large half **mold** (11) releasably connected to a small half **mold** (30), and an insulated **vessel** (70). When the device is filled with liquid and submitted to freezing temperatures the liquid freezes from the top down leaving a clear **ice sphere** in the **mold**.

12/41 © EPODOC / EPO

PN - **US2014165624** A1 20140619

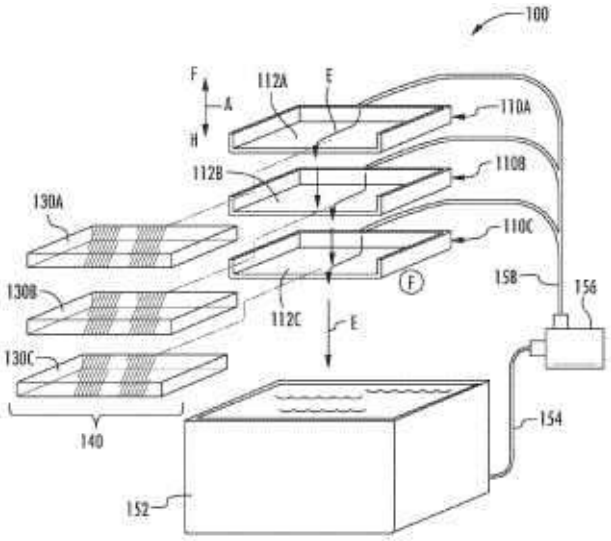
PNFP - US9518770 B2 20161213

PR - US201213713160 20121213

AP - US201213713160 20121213

DT - *; Rep

CT - || R141 (A1)
US3638451 A 19720201 [ ] (BRANDT WILLIAM L);
US6062036 A 20000516 [ ] (HOBELSBERGER JOSEF [DE]);
US2004206250 A1 20041021 [ ] (KONDOU NOBUAKI [JP], et al);
US2007130983 A1 20070614 [ ] (BROADBENT JOHN A [US], et al)
- || STSE (B2)
US3638451 A 19720201 [ ] (BRANDT WILLIAM L);



US6062036 A 20000516 [ ] (HOBELSBERGER JOSEF [DE]); US2004206250 A1 20041021 [ ] (KONDOU NOBUAKI [JP], et al); US2007130983 A1 20070614 [ ] (BROADBENT JOHN A [US], et al)

CCI - F25C1/12 ; F25C1/18 ; F25C5/14

PA - (A1 B2)
WHIRLPOOL CO [US]

TI - (A1)
MULTI-SHEET **SPHERICAL ICE** MAKING

- (B2)
Multi-sheet **spherical ice** making

AB - (A1 B2)
A unitary clear ice sheet is formed from a plurality of individual clear ice sheets which are fused together to give the unitary ice sheet a predetermined thickness. The fused unitary ice sheet is a clear unitary ice sheet due to the formation of the plurality of individual clear ice sheets by running water over a cold plate apparatus or evaporator mechanism to form the ice sheets in a gradual layer-by-layer process. The fused unitary clear ice sheet is used to **mold** or shape clear ice structure therefrom, such as clear **ice spheres** in a **mold** apparatus.

PN - US2014165620 A1 20140619

PNFP - US9080800 B2 20150714

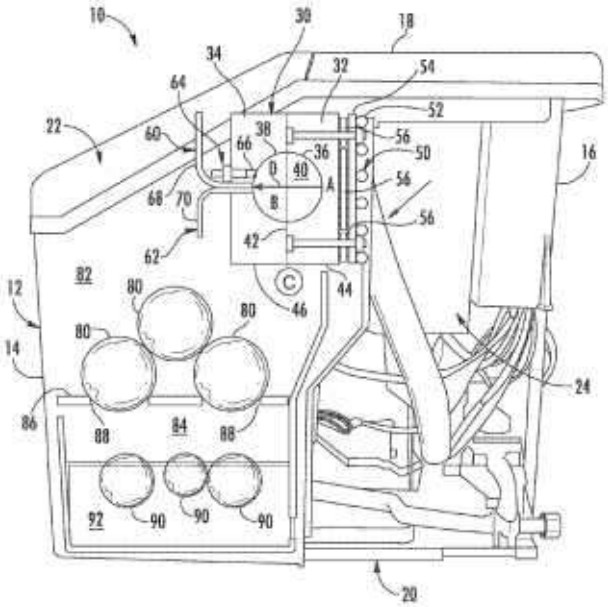
PR - US201213713131 20121213

AP - US201213713131 20121213

DT - *; Rep

CT - || STSE (B2)
US5884487 A 19990323 [ ] (SPRINGWELL DISPENSERS INC [US])
US7448863 B2 20081111 [ ] (YANG WU CHANG [TW])
US8037697 B2 20111018 [ ] (WHIRLPOOL CO [US])
US8677774 B2 20140325 [ ] (YAMAGUCHI HIROKI [JP], et al)
US2004099004 A1 20040527 [ ] (SOMURA KATSUZO [JP])
US2004206250 A1 20041021 [ ] (KONDOU NOBUAKI [JP], et al)
US2005160741 A1 20050728 [ ] (PARK CHANG Y [KR])
US2006288726 A1 20061228 [ ] (MORI KAZUHIRO [JP], et al)
US2007119202 A1 20070531 [ ] (HOSHIZAKI ELECTRIC CO LTD)
US2009173089 A1 20090709 [ ] (WHIRLPOOL PATENTS COMPANY)
US2010055223 A1 20100304 [ ] (TAISIN SEISAKUJYO CO LTD [JP])
US2011005263 A1 20110113 [ ] (HOSHIZAKI ELECTRIC CO LTD)
US2012007264 A1 20120112 [ ] (KONDOU NOBUAKI [JP], et al)

- || R141 (A1)
US5884487 A [ ];
US2004099004 A1 [ ];
US2004206250 A1 [ ];
US2005160741 A1 [ ];
US2006288726 A1 [ ];
US2007119202 A1 [ ];
US7448863 B2 [ ];
US2009173089 A1 [ ];
US2010055223 A1 [ ];
US2011005263 A1 [ ];
US8037697 B2 [ ];
US2012007264 A1 [ ];
US8677774 B2 [ ]



CCI - F25C1/18 ; F25C1/22

PA - (A1 B2)
WHIRLPOOL CO [US]

TI - (A1 B2)
MOLDED CLEAR **ICE SPHERES**

AB - (A1 B2)
A method of making clear **ice spheres** includes a providing a **mold** apparatus having a first **mold** portion and a second **mold** portion having **mold** cavity segments which define one or more **mold** cavities when the **mold** apparatus is assembled in an ice forming position. The **mold** apparatus is then cooled using a cooling source in thermal communication with the first **mold** portion. Water is then injected into the **mold** cavities, such that a portion of the water injected into the **mold** cavities is solidified in a directional manner from the first **mold** portion to the second **mold** portion to create a clear ice structure. Water is continuously circulated within the **mold** cavities to ensure clear ice is formed by injecting and simultaneously ejecting water from the **mold** cavities during ice formation. The ice clear structures are then released from the **mold** apparatus by disassembling the **mold** apparatus.

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PN - US2014165619 A1 20140619

PNFP - US9074803 B2 20150707

PR - US201213713126 20121213

AP - US201213713126 20121213

DT - *; Rep

CT - || STSE (B2)
US5884487 A 19990323 [ ] (DAVIS S SPENCE [US], et al)
US8037697 B2 20111018 [ ] (LECLEAR DOUGLAS DAVID [US], et al)
US8677774 B2 20140325 [ ] (YAMAGUCHI HIROKI [JP], et al)
US2005160741 A1 20050728 [ ] (PARK CHANG Y [KR])
US2006288726 A1 20061228 [ ] (MORI KAZUHIRO [JP], et al)
US2007119202 A1 20070531 [ ] (KADOWAKI SHIZUMA [JP], et al)
US2009173089 A1 20090709 [ ] (LECLEAR DOUGLAS DAVID [US], et al)
US2011005263 A1 20110113 [ ] (YAMAGUCHI HIROKI [JP], et al)
US2012007264 A1 20120112 [ ] (KONDOU NOBUAKI [JP], et al)

- || R141 (A1)
US5884487 A [ ];
US2005160741 A1 [ ];
US2006288726 A1 [ ];
US2007119202 A1 [ ];
US2009173089 A1 [ ];
US2011005263 A1 [ ];
US8037697 B2 [ ];
US2012007264 A1 [ ];
US8677774 B2 [ ]

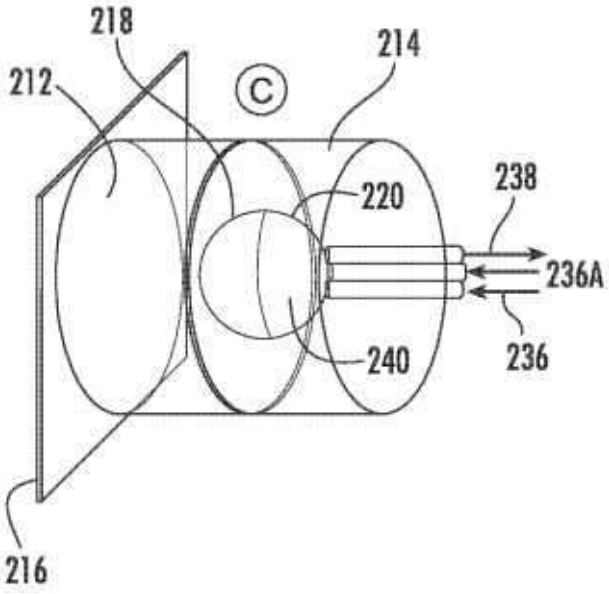
CCI - F25C1/18 ; F25C5/08

CCA - F25C1/22

PA - (A1 B2)
WHIRLPOOL CO [US]

TI - (A1 B2)
CLEAR **ICE SPHERES**

AB - (A1 B2)
A method of making clear **ice spheres** includes a providing a **mold** apparatus having a first **mold** portion and a



second **mold** portion having **mold** cavity segments which define one or more **mold** cavities when the **mold** apparatus is assembled. A clear ice sheet is deposited in the **mold** apparatus in a channel defined by the spaced apart **mold** portions when the **mold** apparatus is in an open position. The **mold** apparatus is assembled about the sheet of clear ice such that the clear ice sheet is shaped to form one or more clear ice structures in the **mold** cavities.

15/41 © EPODOC / EPO

PN - US2014165618 A1 20140619

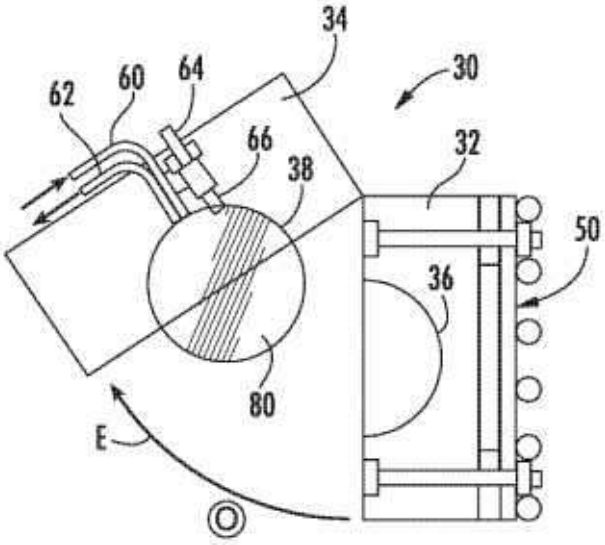
PNFP - US9074802 B2 20150707

PR - US201213713119 20121213

AP - US201213713119 20121213

DT - *; Rep

CT - || R141 (A1)
US5884487 A 19990323 [ ] (DAVIS S SPENCE [US], et al);
US2004099004 A1 20040527 [ ] (SOMURA KATSUZO [JP]);
US2004206250 A1 20041021 [ ] (KONDOU NOBUAKI [JP], et al);
US2005160741 A1 20050728 [ ] (PARK CHANG Y [KR]);
US2006288726 A1 20061228 [ ] (MORI KAZUHIRO [JP], et al);
US2007119202 A1 20070531 [ ] (KADOWAKI SHIZUMA [JP], et al);
US7448863 B2 20081111 [ ] (YANG WU CHANG [TW]);
US2009173089 A1 20090709 [ ] (LECLEAR DOUGLAS DAVID [US], et al);
US2010055223 A1 20100304 [ ] (KONDOU NOBUAKI [JP], et al);
US2011005263 A1 20110113 [ ] (YAMAGUCHI HIROKI [JP], et al);
US8037697 B2 20111018 [ ] (LECLEAR DOUGLAS DAVID [US],



et al);
US2012007264 A1 20120112 [ ] (KONDOU NOBUAKI [JP], et al);
US8677774 B2 20140325 [ ] (YAMAGUCHI HIROKI [JP], et al)

- || STSE (B2)
US5884487 A 19990323 [ ] (DAVIS S SPENCE [US], et al);
US7448863 B2 20081111 [ ] (YANG WU CHANG [TW]);
US8037697 B2 20111018 [ ] (LECLEAR DOUGLAS DAVID [US], et al);
US8677774 B2 20140325 [ ] (YAMAGUCHI HIROKI [JP], et al);
US2004099004 A1 20040527 [ ] (SOMURA KATSUZO [JP]);
US2004206250 A1 20041021 [ ] (KONDOU NOBUAKI [JP], et al);
US2005160741 A1 20050728 [ ] (PARK CHANG Y [KR]);
US2006288726 A1 20061228 [ ] (MORI KAZUHIRO [JP], et al);
US2007119202 A1 20070531 [ ] (KADOWAKI SHIZUMA [JP], et al);
US2009173089 A1 20090709 [ ] (LECLEAR DOUGLAS DAVID [US], et al);
US2010055223 A1 20100304 [ ] (KONDOU NOBUAKI [JP], et al);
US2011005263 A1 20110113 [ ] (YAMAGUCHI HIROKI [JP], et al);
US2012007264 A1 20120112 [ ] (KONDOU NOBUAKI [JP], et al)

CCI - F25C1/18 ; F25C1/25

PA - (A1 B2)
WHIRLPOOL CO [US]

TI - (A1)
CLEAR ICE HYBRID **MOLD**

- (B2)
Clear ice hybrid **mold**

AB - (A1 B2)
A method of making clear **ice spheres** includes a providing a **mold** apparatus having a first **mold** portion and a second **mold** portion

having **mold** cavity segments which define one or more **mold** cavities when the **mold** apparatus is assembled in an ice forming position. The **mold** apparatus includes a water jacketing system which is adapted to keep water in continuous circulation within the **mold** cavities to ensure clear ice is formed. Water is injected into the **mold** cavities and where a portion of the water is frozen to form a clear ice structure and a portion of the water enters the water jacketing system. Water may remain circulating in the water jacketing system, or may be expelled from the **mold** apparatus. The circulating water of the water jacketing system facilitates directional solidification of clear ice structure across a thermal gradient of the **mold** apparatus.

16/41 © EPODOC / EPO

PN - US2014165599 A1 20140619

PNFP - US9200823 B2 20151201

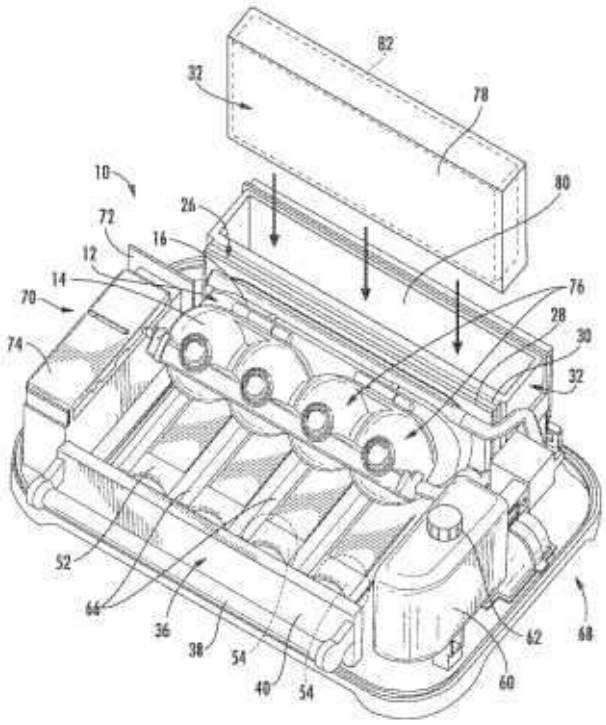
PR - US201213713169 20121213

AP - US201213713169 20121213

DT - *; Rep

CT - || STSE (B2)
US4402185 A 19830906 [ ] (PERCHAK ROBERT M [US])
US5618463 A 19970408 [ ] (RINDLER JOE [US], et al)
US2006053805 A1 20060316 [ ] (FLINNER KLAUS [DE], et al)
US2007193278 A1 20070823 [ ] (POLACEK DENISE C [US], et al)
- || R141 (A1)
US4402185 A [ ];
US5618463 A [ ];
US2007193278 A1 [ ];
US2006053805 A1 [ ]

CCI - F25B21/02 ; F25C1/18 ;



F25C1/22

CUI - F25C1/10

CCA - F25D11/006

PA - (A1 B2)
WHIRLPOOL CO [US]

TI - (A1)
THERMOELECTRIC ICE MAKER

- (B2)
Ice maker with thermoelectrically cooled **mold** for producing **spherical** clear **ice**

AB - (A1 B2)
An ice maker has a **mold** with a first piece and a second piece. A cavity within the **mold** includes a first reservoir in the first piece and a second reservoir in the second piece that align to substantially enclose the cavity. A fluid intake aperture in the first piece extends to the cavity for injecting water therein. A thermoelectric device has a cold side thermally coupled to the exterior surface of the second piece. The thermoelectric device transfers heat from the cold side to a hot side to provide a first temperature to the **mold**. A removable cooling source is thermally coupled to the hot side of the thermoelectric device. The cooling source is configured to reduce the temperature of the hot side to allow the cold side to provide a second temperature that is cooler than the first temperature to freeze the water in the cavity.

PN - US2014165598 A1 20140619

PNFP - US9151527 B2 20151006

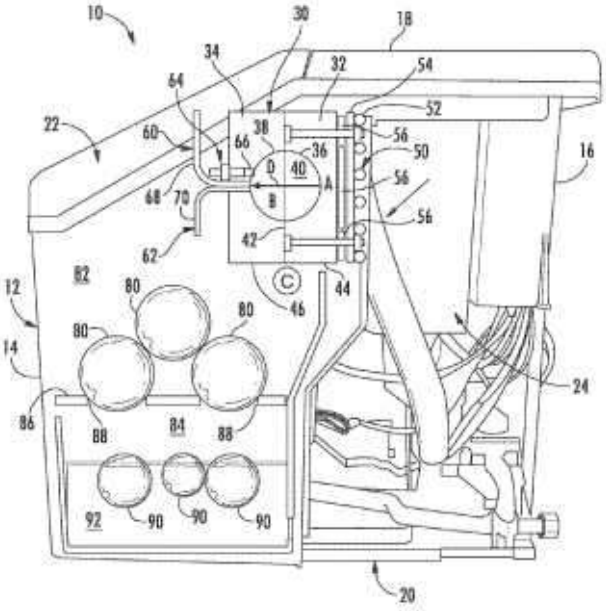
PR - US201213713140 20121213

AP - US201213713140 20121213

DT - *; Rep

CT - || STSE (B2)
US5884487 A 19990323 [ ] (DAVIS S SPENCE [US], et al)
US7448863 B2 20081111 [ ] (YANG WU CHANG [TW])
US8037697 B2 20111018 [ ] (LECLEAR DOUGLAS DAVID [US], et al)
US8677774 B2 20140325 [ ] (YAMAGUCHI HIROKI [JP], et al)
US2004099004 A1 20040527 [ ] (SOMURA KATSUZO [JP])
US2004206250 A1 20041021 [ ] (KONDOU NOBUAKI [JP], et al)
US2005160741 A1 20050728 [ ] (PARK CHANG Y [KR])
US2006288726 A1 20061228 [ ] (MORI KAZUHIRO [JP], et al)
US2007119202 A1 20070531 [ ] (KADOWAKI SHIZUMA [JP], et al)
US2009173089 A1 20090709 [ ] (LECLEAR DOUGLAS DAVID [US], et al)
US2010055223 A1 20100304 [ ] (KONDOU NOBUAKI [JP], et al)
US2011005263 A1 20110113 [ ] (YAMAGUCHI HIROKI [JP], et al)
US2012007264 A1 20120112 [ ] (KONDOU NOBUAKI [JP], et al)

- || R141 (A1)
US5884487 A [ ];
US2004099004 A1 [ ];
US2004206250 A1 [ ];
US2005160741 A1 [ ];
US2006288726 A1 [ ];
US2007119202 A1 [ ];
US7448863 B2 [ ];
US2009173089 A1 [ ];
US2010055223 A1 [ ];
US2011005263 A1 [ ];
US8037697 B2 [ ];
US2012007264 A1 [ ];
US8677774 B2 [ ]



CCI - F25C1/18 ; F25C1/22

PA - (A1 B2)
WHIRLPOOL CO [US]

TI - (A1 B2)
MOLDED CLEAR **ICE SPHERES**

AB - (A1 B2)
An ice maker adapted to make clear **ice spheres** includes a **mold** apparatus having a first **mold** portion and a second **mold** portion. The first and second **mold** portions further include **mold** cavity segments which define **mold** cavities when the **mold** apparatus is assembled in an ice forming position. A cooling source is in thermal communication with the first **mold** portion of the **mold** apparatus, such that water injected into the **mold** cavities is solidified in a directional manner from the first **mold** portion to the second **mold** portion to create a clear ice structure. Water is circulated, typically continuously, within the **mold** cavities to ensure clear ice is formed by injecting and simultaneously ejecting water from the **mold** cavities during ice formation.

18/41 © EPODOC / EPO

PN - CN103011380 A 20130403

PNFP - CN103011380B B 20131120

PR - CN20121504920 20121203

AP - CN20121504920 20121203

DT - I

CT - || STSE (A)
CN102408160 A 20120411 [A] (UNIV BEIJING NORMAL) [A]
CN102500340 A 20120620 [A] (UNIV BEIJING NORMAL) [A]
EP2489429 A1 20120822 [A] (UREA CASALE SA [CH]) [A]

PA - (A B)
UNIV BEIJING NORMAL

TI - (A B)
Preparation method of biodegradable oil absorption plate capable of slowly releasing nitrogen element

AB - (A)
The invention discloses a preparation method of a biodegradable oil absorption plate capable of slowly releasing nitrogen element. The method comprises the following steps of measuring urea and formaldehyde aqueous solutions in a ratio of 6.5 to 1, and regulating the pH value of the urea aqueous solution to be between 7.2 and 7.4; adding formaldehyde into the urea aqueous solution, stirring for 90 to 100 minutes, regulating the pH value to be between 3.2 and 3.4, and adding deionized water to obtain mixed solution M1; mixing 9.5 percent by mass of poly-beta-polyhydroxybutyrate and polyethyleneglycol chloroform solutions in a ratio of 5 to 1; dropwise adding the M1 into the chloroform mixed solution in a ratio of 1 to 4; injecting the distilled water into a **container** filled with liquid nitrogen, quickly freezing to manufacture **spherical ice** ball particles, screening and compacting in the cavity of a die; pouring the mixed solution into the die for chilling, demolding and lyophilizing in vacuum to obtain the biodegradable oil absorption plate capable of slowly releasing nitrogen element. The preparation method is simple in manufacture process, and the prepared porous plate is high in petroleum hydrocarbon pollutant processing efficiency, and cannot cause secondary pollution or destruction to the water ecological environment.

19/41 © EPODOC / EPO

PN - CN102408160 A 20120411

PNFP - CN102408160B B 20130102

PR - CN20111291348 20110930

AP - CN20111291348 20110930

DT - I

CT - || STSE (A)
CN102199589 A 20110928 [A] (UNIV BEIJING NORMAL)
[A] 1
说明书第1-3页发明内容部分
CN101522800 A 20090902 [A] (KAO CORP [JP])
[A] 1
说明书第2-12页发明内容部分
US2008226580 A1 20080918 [A] (MAEDA MIZUO [JP], et al)
[A] 1
说明书0021-0052段
XP022667760 A 00000000 [A]

CTNP - || STSE (A)
[A] Jun Li et al, "Cyclodextrin-based supramolecular architectures: Syntheses, structures,and applications for drug and gene delivery", <<Advanced Drug Delivery Reviews>>, (20080304), vol. 60, no. 9, doi:doi:10.1016/j.addr.2008.02.011 , PAGE 1000 - 1017, XP022667760

[A] 1
第1000-1017页
[ ] <<Biomaterials>> 20060403 Jun Li et al Self-assembled supramolecular hydrogels formed by biodegradable PEO-PHB-PEO triblock copolymers and a-cyclodextrin for controlled drug delivery 第4132-4140页 1
第27卷,
[A] Jun Li et al, "Self-assembled supramolecular hydrogels formed by biodegradable PEO-PHB-PEO triblock copolymers and a-cyclodextrin for controlled drug delivery", <<Biomaterials>>, (20060403), vol. 27, PAGE 4132 - 4140
[A] 1
第4132-4140页

PA - (A B)
UNIV BEIJING NORMAL

TI - (A)
Biodegradable perforated plate for adsorption and biodegradation of petroleum hydrocarbon pollutants as well as its preparation method
- (B)
Biodegradable perforated plate for adsorption and biodegradation of petroleum hydrocarbon pollutants as well as preparation method thereof

AB - (A)
The invention discloses a biodegradable perforated plate for adsorption and biodegradation of petroleum hydrocarbon pollutants as well as its preparation method. The method comprises the steps of: spraying distilled water into a **container** loaded with liquid nitrogen for rapid refrigeration so as to prepare **spheroidal ice** ball particles, which are sieved by a sieve and then placed in a mould cavity for compaction; mixing 10 mass percent of a poly-beta-hydroxybutyrate chloroform solution and 10 mass percent of a polyoxyethylene chloroform solution fully in a volume ratio of 5:1, cooling the mixture, and then pouring it into the mould loaded with ice ball particles for freezing molding, then carrying out demoulding and vacuum freeze drying for removing chloroform and ice ball particles, thusobtaining a composite perforated plate of poly-beta-hydroxybutyrate and polyoxyethylene; culturing the perforated plate in a culture solution of petroleum hydrocarbon degrading bacteria for 24h, thentaking it out for air drying, thus obtaining a biodegradable perforated plate for adsorption and biodegradation of petroleum hydrocarbon pollutants. The preparation method of the invention has a simple process, and the prepared perforated plate has high treatment efficiency to petroleum hydrocarbon pollutants, and cause no secondary pollution and destruction to a water ecological environment.

PN - EP2446977 A1 20120502

PR - DE20101050248 20101102

AP - EP20110005966 20110721

DT - *; Rep

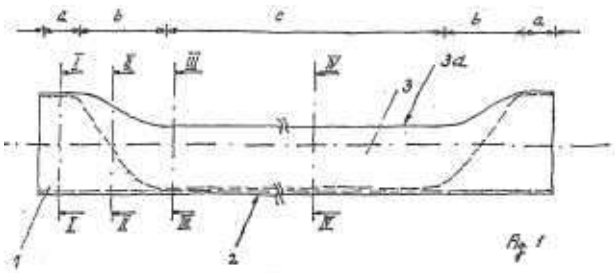
CT - || STSE (A1)
DE102007002448 A1 20080717
[I] (BENTELER AUTOMOBILTECHNIK GMBH [DE])
[I] 1-12
* paragraph [0003] *
* paragraph [0034] - paragraph [0036]; figure - *;
WO2004033126 A1 20040422
[A] (DAIMLER CHRYSLER AG [DE], et al)
[A] 1,11
* page 1, paragraph 3; claims 1,6 *;
DE102004046119 A1 20060406
[A] (UNIV KASSEL [DE])
[A] 11
* paragraph [0012]; claim - *;
EP1577404 A1 20050921
[AD] (BENTELER WERKE AG [DE])
[AD] 1,11
* the whole document *;
EP0752332 A1 19970108
[AD] (BENTELER WERKE AG [DE])
[AD] 1,11
* the whole document *

CCI - B21D22/025 ; B21D53/88 ; C21D7/13 ; C21D9/0068 ; C21D9/08 ; C21D1/673

CCA - C21D2221/00 ; C21D2221/01 ; C21D2221/02

PA - KIRCHHOFF AUTOMOTIVE D GMBH [DE]

TI - Method for producing a tubular profile

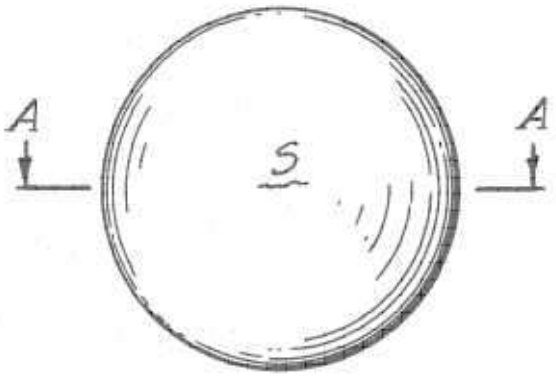


AB - The method comprises austenitizing a tube from an air-hardening steel, and performing heat transformation of a tube middle region into a U-shaped cross-section using tool upper and lower parts while retaining the ends with a circular cross-section (1). The middle region is transformed from the circular cross-section to the U-shaped cross-

section to form ears between the circular ends and the middle region without the tool contact or only with the lower side, one-sided tool contact. The U-shaped cross-section is held without touching the tool upper and lower parts during the transformation. The method comprises austenitizing a tube from air-hardening steel, and performing heat transformation of a tube middle region into a U-shaped cross-section using tool upper and lower parts while retaining the ends with a circular cross-section (1). The middle region is transformed from the circular cross-section to the U-shaped cross-section to form ears between the circular ends and the middle region without the tool contact or only with the lower side, one-sided tool contact. The U-shaped cross-section is held without touching the tool upper and lower parts during the transformation of the middle region. The middle region is press cured by cooling the tool upper and lower parts during the transformation. The shaped tubular profile is cooled in air at room temperature during the formation of a **mold** section and cooled with water mist following the shaping step. A material of the tube section is coated before austenitization for corrosion resistance. The austenitization and the heat transformation are carried out under an inert gas atmosphere. The tubular profile is heated to 930[deg] C and held in the same temperature for several minutes before performing the heat transformation. The formed tubular profile is irradiated with glass beads, dry **ice** or **spheres**, steel balls or grains after cooling. An independent claim is included for a tubular profile as a transverse carrier for a torsion beam axle of a

motor vehicle.

21/41 © EPODOC / EPO



PN - US3640081 A 19720208

PR - US19690812782 19690402

AP - USD3640081 19690402

DT - *

CT - US290296 A [ ]; US290788 A [ ]; US2812551 A [ ]; US2967329 A [ ]; US3479501 A [ ]; US225621 A [ ]; US282000 A [ ]; US3159011 A [ ]

CCI - F25C1/10 ; F41J1/01

PA - OLIN MATHIESON

TI - HOLLOW **SPHERICAL ICE** BODIES AND METHOD OF MAKING THE SAME

AB - A hollow body of ice for use as a target, the ice body being sufficiently frangible to shatter when struck by a fired pellet. A method of making the hollow ice bodies comprising introducing a measure of water into a **mold** cavity so as to cover substantially the entire surface of the **mold** cavity with water. The water is then cooled to a temperature below its freezing point to form a thin shell of ice adjacent to the **mold** cavity surface. The **mold** is then opened and the shell of ice is removed from the **mold** cavity.

TXT - Spherical target made of ice

22/41 © EPODOC / EPO

PN - US2004099004 A1 20040527

PNFP - US6857277 B2 20050222

PR - JP20000265037 20000901; WO2001JP07599 20010903

AP - US20030362995 20030721

DT - **

CT - || STSE (B2)
US3296822 A 19670110 [ ] (HANS GRAM)
US4852359 A 19890801 [ ] (MANZOTTI ERMANNO J [US])
US5618463 A 19970408 [ ] (RINDLER JOE [US], et al)
US5970735 A 19991026 [ ] (HOBELSBERGER JOSEF [DE])
US6286331 B1 20010911 [ ] (LEE ILLYONG [KR])
US6425438 B1 20020730 [ ] (HAHN TERRANCE L [US])
US6534106 B2 20030318 [ ] (CATHENAUT PHILIP IGOR [FR], et al)
JPH01310277 A 19891214 [ ] (KAWAGUCHI KENSHO)
JPH02161271 A 19900621 [ ] (HARA YASUO)

- || R141 (A1)
US3296822 A [ ];
US6534106 B2 [ ];
US5618463 A [ ];
US6425438 B1 [ ];
US4852359 A [ ];
US6286331 B1 [ ];
US5970735 A [ ]

CCI - F25C1/18 ; F25C1/22

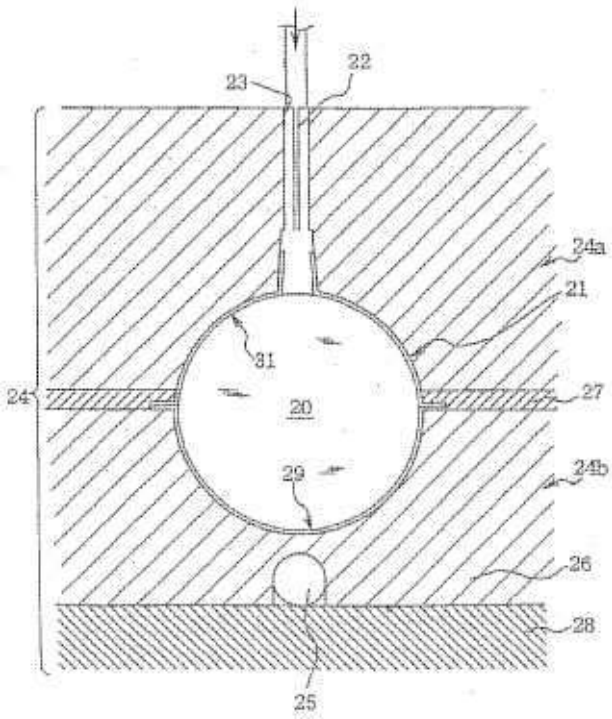
CCA - Y02P60/855

TI - (A1)
Method and apparatus for producing stereoscopic ice of transparent sphere or the like

- (B2)
Process and equipment for manufacturing clear, solid **ice** of **spherical** and other shapes

AB - (A1)
The process and equipment,

FIG. 1



according to this invention, for manufacturing clear, solid **ice** of **spherical** and other shapes are capable of making clear ice balls and block ice of other shapes in the **mold** quickly, efficiently, and with effective energy utilization. This process is characterized in the steps of: a) preparing a **mold** for making ice balls and block ice of other shapes, which comprises an upper **mold** (24a) made of an insulating material and provided with a vertical injection hole (23) drilled therein and a water-injection nozzle (22) fitted in the hole; and a lower **mold** (24b) made of a water-freezing block (26) having coolant pipe (25) embedded therein; b) preparing for a domed lid (21a) or the lid of a different shape made of an insulating sheet, said lid (21a) having a shape that fits in with the surface shaped for the upper **mold** (24a) and being provided with a cylinder for being fitted into the vertical injection hole (23); and a shaped hemispherical cup (21b) of the same insulating sheet, which similarly fits in with the shaped surface of the lower **mold** (24b); c) assembling both halves of the **mold** (24) after the lid (21a) and the cup (21b) have been attached tightly to each other and placed in the **mold**; d) then, keeping the liquid to be frozen cooled at a predetermined temperature and spraying the liquid intermittently in the direction of the water-freezing block (26) that has been cooled to a predetermined freezing temperature; e) repeating the spraying operation to freeze the sprayed liquid in the **container**

(21), layer by layer, until clear ice balls (20) or block ice of other shapes are formed; and f) disassembling the halves of the **mold** under the ice-releasing effect, which the ice **container** (21) has on the ice-making **mold** (24), and immediately taking out the shaped ice balls (20) or the block ice of a different shape.

- (B2)

The process and equipment, according to this invention, for manufacturing clear, solid **ice** of **spherical** and other shapes are capable of making clear ice balls and block ice of other shapes in the **mold** quickly, efficiently, and with effective energy utilization. This process is characterized in the steps of:a) preparing a **mold** for making ice balls and block ice of other shapes, which comprises an upper **mold** (24a) made of an insulating material and provided with a vertical injection hole (23) drilled therein and a water-injection nozzle (22) fitted in the hole; and a lower **mold** (24b) made of a water-freezing block (26) having coolant pipe (25) embedded therein;b) preparing for a domed lid (21a) or the lid of a different shape made of an insulating sheet, said lid (21a) having a shape that fits in with the surface shaped for the upper **mold** (24a) and being provided with a cylinder for being fitted into the vertical injection hole (23); and a shaped hemispherical cup (21b) of the same insulating sheet, which similarly fits in with the shaped surface of the lower **mold** (24b); c) assembling both halves of the **mold** (24) after the lid (21a) and the cup (21b) have been

attached tightly to each other and placed in the **mold**;d) then, keeping the liquid to be frozen cooled at a predetermined temperature and spraying the liquid intermittently in the direction of the water-freezing block (26) that has been cooled to a predetermined freezing temperature;e) repeating the spraying operation to freeze the sprayed liquid in the **container** (21), layer by layer, until clear ice balls (20) or block ice of other shapes are formed; andf) disassembling the halves of the **mold** under the ice-releasing effect, which the ice **container** (21) has on the ice-making **mold** (24), and immediately taking out We shaped ice balls (20) or the block ice of a different shape.

23/41 © EPODOC / EPO

PN - JP2007247937 A 20070927

PR - JP20060070150 20060315

AP - JP20060070150 20060315

DT - I

FI - F25C1/00&A

PA - MIYAZAKI PREFECTURE

TI - MANUFACTURING METHOD AND MANUFACTURING DEVICE FOR **SPHERICAL ICE** PARTICLE IN HYDROPHOBIC LIQUID

AB - PROBLEM TO BE SOLVED: To provide a method of manufacturing **spherical ice** particles used for ice blast finishing, decoration and variety of firmness of ice such as ice-cream and sherbet, alternative to crush ice to keep fresh food in cool, and a washing material for dishes and food packages.

- SOLUTION: Droplets of supercooled liquid is dropped in a liquid **vessel** filled with hydrophobic liquid, and the droplets released from a supercooling state, is frozen in the hydrophobic liquid to manufacture the ice particles.
- COPYRIGHT: (C)2007,JPO&INPIT

24/41 © EPODOC / EPO

PN - JP2005172408 A 20050630

PR - JP20030436430 20031209

AP - JP20030436430 20031209

DT - I

FI - F25C1/20&B; F25C1/24&303

PA - NAKAI CHIFUMI

TI - ICE MAKING DEVICE FOR MAKING POLYHEDRAL ICE SUCH AS **SPHERICAL ICE**, AND ICE MAKING METHOD FOR POLYHEDRAL ICE SUCH AS **SPHERICAL ICE**

AB - PROBLEM TO BE SOLVED: To provide a method for producing polyhedral ice such as **spherical ice** with an ideal condition, and a method for making transparent ice.

- SOLUTION: Ice making frames having the proper number of polyhedral frames such as spherical ones are submerged in four side faces inside an ice making **container** filled with water, and are attracted to the side faces via magnets or the like. The proper number of small holes is provided in the polyhedral frames such as spherical ones, air is injected from an air injector provided in the central part in the ice making **container** to accelerate convection, so as to start refrigeration ice making. Refrigeration is stopped in a stage where ice is made in the four side faces and where the central part is still under a liquid stage, and the ice making **container** is taken out in the stage to produce the polyhedral ice such as the **spherical ice**.
- COPYRIGHT: (C)2005,JPO&NCIPI

25/41 © EPODOC / EPO

PN - **JP2004183931** A 20040702

PNFP - JP4207189B B2 20090114

PR - JP20020349238 20021129

AP - JP20020349238 20021129

DT - I

FI - F25C1/24&304; F25C1/24&307

PA - (A)
YOSHINO KOGYOSHO CO LTD

TI - (A)
TRANSPARENT**SPHERICAL ICE** PRODUCING **CONTAINER**

AB - (A)
PROBLEM TO BE SOLVED: To provide a transparent **spherical ice** producing **container** allowing the connection thereof airtight to a vertical side **container** so that air does not invade into a first ice-making chamber in ice-making and allowing, in a short time, the easy retrieval of spherical ices iced in the first ice-making chamber after ice making.

- SOLUTION: The first ice-making chamber W1 formed of the combination of a lower side **container** 4 with an upper side **container** 3 is disposed at the inner upper part of a cup body 5a having an air layer 51, and a second ice-making chamber W2 is formed under the first ice-making chamber W1 at a position surrounded by the air layer 51. A recessed part 41 is formed in the upper end inner periphery of the lower side **container** 4 and a mouth tube part 45 having a screw 46 on the outer periphery thereof is formed on the upper end side face thereof. An engagement release body 3a raising the lock piece 32 of an inner **container** 3 when the lower part thereof is pressed by the corner part of a flange 44 is formed integrally with the upper side **container** 3, and a pressing cover 2 is threadedly fitted to the mouth tube part 45.
- COPYRIGHT: (C)2004,JPO&NCIPI

26/41 © EPODOC / EPO

PN - JP2004183930 A 20040702

PNFP - JP4269251B B2 20090527

PR - JP20020349234 20021129

AP - JP20020349234 20021129

DT - I

FI - F25C1/24&304; F25C1/24&307

PA - (A)
YOSHINO KOGYOSHO CO LTD

TI - (A)
SPHERICAL ICE PRODUCING **CONTAINER** WITH TILTED SURFACE

AB - (A)
PROBLEM TO BE SOLVED: To provide a **spherical ice** producing **container** allowing the easy retrieval of round ices.

- SOLUTION: This **spherical ice** producing **container** comprises a bottomed cylindrical water storage **container** and a round **container** having a spherical space on the inner side thereof by densely engaging a round **container** upper half shell with a round **container** lower half shell having inner surfaces formed in semi-spherical shapes by undercut connection at the outer peripheral ends thereof. The tilted surface opening upward is disposed on the round **container** upper half shell so as to be pressed from the outer periphery of the round **container** lower half shell. By this, when the round ices are made in the round **container**, the tilted surface is pressed from the outer periphery of the lower half shell to raise the round **container** upper half shell in a direction apart from the round **container** lower half shell so that the round ices can be easily removed from the round **container**.
- COPYRIGHT: (C)2004,JPO&NCIPI

27/41 © EPODOC / EPO

PN - JP2004183929 A 20040702

PNFP - JP4147921B B2 20080910

PR - JP20020349233 20021129

AP - JP20020349233 20021129

DT - I

FI - F25C1/24&304

PA - (A)
YOSHINO KOGYOSHO CO LTD

TI - (A)
SPHERICAL ICE PRODUCING **CONTAINER**

AB - (A)
PROBLEM TO BE SOLVED: To provide a **spherical ice** producing **container** allowing the easy and rapid retrieval of **spherical ice** after icing.

- SOLUTION: In this **spherical ice** producing **container**, a plurality of small holes at the bottom part of an inner cup body formed by vertically installing an outer tube from the upper end of the bottomed cylindrical inner cup stored in the bottomed cylindrical

outer cup through an outer flange peripheral piece, an air hole is formed at the top part thereof, a first ice-making chamber is formed in a spherical shell, the spherical shell is stored in the upper part of the inner cup body, and a second ice-making chamber is formed of the inner cup and a lower half spherical shell. Also, the **spherical ice** producing **container** is so formed that the upper half spherical shell and the lower half spherical shell can be disengaged and engaged by the sliding of the tilted surface formed on at least one projected piece of a guide projected piece and a sliding projected piece on the other projected piece in the relative rotation of the upper half spherical shell to the lower half spherical shell by using the projected pieces.

- COPYRIGHT: (C)2004,JPO&NCIPI

28/41 © EPODOC / EPO

PN - JP2004183911 A 20040702

PNFP - JP4269250B B2 20090527

PR - JP20020347732 20021129

AP - JP20020347732 20021129

DT - I

FI - F25C1/24&303; F25C1/24&307

PA - (A)
YOSHINO KOGYOSHO CO LTD

TI - (A)
SPHERICAL ICE PRODUCING **CONTAINER** WITH HANDLE

AB - (A)
PROBLEM TO BE SOLVED: To provide a **spherical ice** producing **container** with a handle allowing the easy takeout of round ice.

- SOLUTION: This **spherical ice** producing **container** with the handle comprises a cylindrical water storage **container** and a round **container** formed by densely engaging a round **container** upper half shell and a round **container** lower half shell having inner surfaces formed in semi-spherical shapes by undercut connection to provide a spherical space therein. The handle for pulling the round **container** upper half shell upward from the round **container** lower half shell is installed on the round **container** upper half shell. Thus, by using the handle, the round **container** upper half shell can be raised in a direction for separating the round **container** lower half shell from the round **container** lower half shell, and the round ice can be easily taken out from the round **container**.

- COPYRIGHT: (C)2004,JPO&NCIPI

29/41 © EPODOC / EPO

PN - JP2004177087 A 20040624

PNFP - JP4147919B B2 20080910

PR - JP20020347375 20021129

AP - JP20020347375 20021129

DT - I

FI - F25C1/24&304

PA - (A)

YOSHINO KOGYOSHO CO LTD

TI - (A)
SPHERICAL ICE MAKING **VESSEL**

AB - (A)
PROBLEM TO BE SOLVED: To provide a **spherical ice** making **vessel** permitting easily and quickly taking out a **spherical ice** after completion.

- SOLUTION: In this **spherical ice** making **vessel**, the lower surface of an outer collar circumferential piece is abutted against the upper end face of an outer cup, and an air layer surrounding the side face and bottom of an inner cup is formed with the inner cup stored inside the outer cup. In the **spherical ice** making **vessel**, a first ice making chamber is formed inside a spherical shell, and the spherical shell is stored inside the upper part of the inner cup body with the lower surface of a lower flange is abutted against the upper end face of a sheath cylinder. In the **spherical ice** making **vessel**, a second ice making chamber is formed by the inner cup and a lower semi-spherical shell, and the corner part of an upper flange is a pull-out knob piece with the corner part of the upper flange shifted in position from the corner part of the lower flange.
- COPYRIGHT: (C)2004,JPO

30/41 © EPODOC / EPO

PN - JPH01114684 A 19890508

PR - JP19870269469 19871027

AP - JP19870269469 19871027

DT - I

CT - JPS5637473 A [ ]; JP51113261B B [ ];
JPS58217170 A [ ]; JPS515757B B1 [ ];
JPS5952887B B2 [ ]

FI - F25C1/20&B; F25C1/24&304

PA - NICHIREI KK

TI - MANUFACTURE OF ODD-SHAPED ICE

AB - PURPOSE: To facilitate making of transparent odd-shaped ice with simple work by simply taking out ice inside an ice making retainer to obtain flexibly shaped ice according to the shape of the ice making retainer. CONSTITUTION: Ice making raw water in an ice making retainer 1 is significantly affected by the agitation of the ice making raw water 14 existing outside it through a water passing hole 5 and an ice freezing layer growing on the wall of each ice making retainer 1 also always undergoes freezing from renewed ice making water to be further turned transparent. In this manner, the ice frozen in the ice making retainer provides transparent ice totally. The frozen layer grown on the wall of an ice making can entirely wrap the ice making retainer 1 and the ice making work is stopped when all of the ice making raw water is frozen sufficiently in the ice making retainers 1. Then, a drop tube 11 is pulled up to withdraw the ice making can 10 from a cooling brine tank 16 and the ice grown inside is taken out of the ice making can 10. After the ice is melted, the ice making retainers 1 are taken out individually and an upper **mold** 3 is taken off a lower **mold** 2 to obtain a grown **spherical ice** therein.

31/41 © EPODOC / EPO

PN - JPS6430541 A 19890201

PNFP - JPH0378090B B2 19911212

PR - JP19870188399 19870727

AP - JP19870188399 19870727

DT - I

FI - A23G3/20; A23G9/04; A23G9/14; A23G9/24; A23G9/46; A23G9/52

FT - 4B014/GE03; 4B014/GE06; 4B014/GP05; 4B014/GP12; 4B014/GP19; 4B014/GQ06; 4B014/GQ09; 4B014/GQ10; 4B014/GQ12

PA - (A)
KANEBO LTD

TI - (A)
PREPARATION OF COATED **SPHERICAL ICE** CREAM

AB - (A)
PURPOSE:To mechanically prepare a **spherical ice** cream, by filling a semifluid soft ice cream in a hemispherical **mold** and freezing the cream while preventing the flattening of the lower part of the sphere. CONSTITUTION:A **spherical ice** cream composed of a semifluid 1 as a core, a chocolate cream 2 surrounding the circumference of the core and cocoa powder 15 and nut particles 16 applied to the surface of the chocolate cream is prepared by the following process. A semifluid 1 is extruded through a central nozzle of a concentrically arranged nozzles, a hemispherical **mold** is placed immediately below the nozzle and a chocolate cream 2 is executed through the outer nozzle. The extruded material composed of the semifluid 1 as a core and the chocolate cream 2 surrounding the semifluid is filled in a hemispherical **mold** and formed into a spherical form. After freezing and hardening the cream, it is released from the hemispherical **mold**. The obtained ice cream having nearly spherical form is coated with a coating material in a rotary pan to improve its sphericity.

32/41 © EPODOC / EPO

PN - JPH092562 A 19970107

PNFP - JP2626883B B2 19970702

PR - JP19950172987 19950616

AP - JP19950172987 19950616

DT - I

FI - A23G9/04; A23G9/50; B65D51/20; B65D85/78

FT - 3E035/AA17; 3E035/BA04; 3E035/BA10; 3E035/BB08; 3E084/AA06; 3E084/AA12; 3E084/AA24; 3E084/AB10; 3E084/BA01; 3E084/CA10; 3E084/CB01; 3E084/CC03; 3E084/DA01; 3E084/DB01; 3E084/DB11; 3E084/DC03; 3E084/FA09; 3E084/FD13; 3E084/GB08; 3E084/GB12; 3E084/LA02; 3E084/LA06; 4B014/GB18; 4B014/GE12; 4B014/GP12; 4B014/GQ12; 4B014/GT00

PA - (A)
SHIEFU REDEII KK

TI - (A)
ICE CREAM **CONTAINER**

AB - (A)

PURPOSE: To provide an ice cream **container** at a low cost wherein after a bubbled material of ice cream is injected into a semi-spherical recess and frozen, a part of a semi-spherical peripheral wall is torn by pulling a holding part of a flat plate around the recess, so that semi-**spherical ice** cream can be discharged without losing its shape. CONSTITUTION: On a flat plate part 11A around a semi-spherical recess 12 formed on a thin and flat plastic plate 11, a pair of cuts 13, 13 directing toward a semi-spherical peripheral wall 12A of the recess 12 are provided with a required distance, while short protruding strings 15, 15 as tearing guides for the peripheral wall 12A are provided below the peripheral wall 12A on extensions of the cuts 13, 13 toward a summit 12AA of the peripheral wall 12A.

33/41 © EPODOC / EPO

PN - JPH0223859 A 19900126

PNFP - JPH0314423B B2 19910226

PR - JP19880172081 19880711

AP - JP19880172081 19880711

DT - I

FI - C12G3/08

PA - (A)
TSURUMI SYUZO KK

TI - (A)
ALCOHOLIC BEVERAGE

AB - (A)
PURPOSE:To provide the title beverage, with its water component frozen as **spherical ice** crystals, good in fluidity, capable of being readily taken out from a **container** such as a bottle and of giving favorable eating feel, based on, e.g., Japanese wine, fruit wine, liqueur. CONSTITUTION:For example, using a V-type mixer, a base wine is cooled at temperatures below its freezing point while retaining an agitating state enough not to attach ice crystals to the wall surface, thus obtaining the objective beverage with its water component frozen as **spherical ice** crystals.

34/41 © EPODOC / EPO

PN - JPH109734 A 19980116

PR - JP19960164613 19960625

AP - JP19960164613 19960625

DT - I

FI - F25C1/00&Z; F25C1/12&A

PA - MITSUI SHIPBUILDING ENG

TI - MANUFACTURE OF **SPHERICAL ICE**

AB - PROBLEM TO BE SOLVED: To easily mass-produce **spherical ice** balls having relatively small diameters with a simplified installation by supplying water or liquid containing water to a water repellent surface and cooling a water droplet or a liquid droplet to a freezing point. SOLUTION: A water repellent surface 1 is slantingly mounted, and a nozzle 2 for water or an aqueous solution is disposed upward on an upper end side and an ice recovery apparatus 2 downward on a lower end side. A cooling jacket 5 is

mounted on the back of a plate on which a water repellent surface 1 is provided to cool a water droplet or a liquid droplet 6 on the water repellent surface 1 into a **spherical ice** 7. A refrigerant supplied to the cooling jacket 5 is sent through a refrigerant line 5a to a freezer 8, and the refrigerant from the cooling jacket 5 is returned to the freezer 8 through the refrigerant line 5b. The water or the aqueous solution 6 is stored in a water **container** 10 on which a stirrer 9 is mounted, and is supplied from a piping 12 including a flow rate adjusting valve 11 interposed thereon to the nozzle 2.

35/41 © EPODOC / EPO

PN - JPH01310277 A 19891214

PR - JP19880142509 19880608

AP - JP19880142509 19880608

DT - I

CT - JP63104961B B [ ]

FI - F25C1/00&B; F25C5/14; F25C5/16

PA - KAWAGUCHI KENSHO

TI - ICE BLOCK FORMED INTO SPHERICAL SHAPE BY PRESSING AND HEAT MELTING AND MANUFACTURE THEREOF

AB - PURPOSE:To form an ice block into a spherical shape efficiently by a method wherein crushed ice is put into a **spherical ice** forming device, divided into upper and lower semi-spherical cups and heater by the upper and lower cups, to press the corners and surface of the crushed ice while heating it from up-and-down direction. CONSTITUTION: The base plate 5 of a pressing and heating forming device 1 is heated by a heater 10 to heat the pressing and heating surface 3 for an ice block by the transfer of heat, then, the other heating surface 3' is heated sufficiently by turning the device and, thereafter, the lower half of a polygonal ice block A is put into the ice block pressing and heating surface 3. When the lower half of the ice block 1 begins to be molten along the semi-spherical surface of the heated ice block pressing and heating surface 3, an upper side pressing and heating forming **mold** 1' is pushed down simultaneously to press the polygonal ice block A strongly from the upper side thereof by the upper side ice block pressing and heating surface 3 and melt instantaneously the surface of the block along the semi-**spherical ice** block pressing and heating surface 3, 3' by pinching the block from upper and lower sides thereof while pressing and heating it. The upper and lower ice block pressing and heating surfaces 3, 3' are closed gradually as the corners of the ice block are molten and the shape of the same approaches a spherical shape step by step, then, a **spherical ice** block B, molten along the upper and lower ice block pressing and heating surfaces 3, 3', may be obtained at last.

36/41 © EPODOC / EPO

PN - JPH05277302 A 19931026

PR - JP19920108380 19920402

AP - JP19920108380 19920402

DT - I

FI - A23F5/30; B01D9/02&601; B01D9/02&601D; B01D9/02&602; B01D9/02&602B; B01D9/02&603; B01D9/02&603H; B01D9/02&604; B01D9/02&605; B01D9/02&608; B01D9/02&608A; B01D9/02&611; B01D9/02&611Z; B01D9/02&612; B01D9/02&615;

B01D9/02&615Z; B01D9/02&617; B01D9/02&618; B01D9/02&618A; B01D9/02&625; B01D9/02&625B; B01D9/04; C12G3/08

FT - 4B027/FB22; 4B027/FB24; 4B027/FE06; 4B027/FQ12; 4D055/AA04; 4D055/BA02; 4D055/CA09; 4D055/DA05; 4D055/DA14; 4D055/DA20; 4D055/DA24; 4D055/DA27; 4D055/DA29; 4D055/DA39; 4D055/DA40; 4D055/EA02

AB - PURPOSE:To increase the separation efficiency of a concentrate and water by freezing high moisture material so that large **spherical ice** crystals may be formed. CONSTITUTION:High moisture material is sealed in a material **container** 6 which is to be installed in a crystallizer 1 in the shape of a pressure **vessel**. The pressure of the crystallizer 1 is controlled with a high pressure pump 12. The material made in the supercooled state in the crystallizer 1 pressurizes the inside of the crystallizer 1. Next, when the pressure is relieved, the supercooled state is released, permitting the material to be frozen. And when the crystallizer is pressurized again, a part of the formed ice crystals is thawed to turn them into granulated ice crystals. And the pressure is relieved to grow the granulated ice crystals. Thereby large **spherical ice** crystals not including the concentrate are obtained.

37/41 © EPODOC / EPO

PN - JPH10253212 A 19980925

PR - JP19970099560 19970312

AP - JP19970099560 19970312

DT - I

FI - F25C1/24&304

PA - TAKADA HIDEAKI

TI - **SPHERICAL**-**ICE** MAKER

AB - PROBLEM TO BE SOLVED: To enable to form **spherical ice** easily by forming spherical space parts combining an upper **container** and a lower **container**, filling the space parts with water and chilling them inside a refrigerator. SOLUTION: Combining an upper **container** 1 and a lower **container** 2 each of which is formed with multiple semi-spherical recessed parts on opposing surfaces, multiple semi-spherical space parts can be formed and filling the space parts with water and chilling them inside the refrigerator, **spherical ice** is formed. Arranging small holes on top of the semi-sphere of the upper **container** 1, air inside the spherical space parts can be discharged easily and clear **spherical ice** without air bubbles can be produced.

38/41 © EPODOC / EPO

PN - FR2315246 A1 19770121

PR - FR19750019692 19750624

AP - FR19750019692 19750624

DT - *; Rep

CCI - A47G23/04 ; F25C5/18

PA - MACAPLE MANUF CAOUTCHOUC PLESS [FR]

TI - Double walled ice cube bowl - has half shell with insulating inner shell and protective outer shell

AB - The double-walled **spherical ice** cube **container** is made from two hollow spheres split

into hemispheres which fit snugly one inside the other. The outer shells may have variegated window cut-outs which reveal the inner shell. The inner shell is of insulating material and the outer (4) of more robust material for protective purposes. The inner shells may be black and the outer shells (4) white. In this case the windows (5) in the outer shell may have a specific geometrical arrangement which gives the assembled **container** the aspect of a panelled football.

39/41 © EPODOC / EPO

PN - EP1314939 A1 20030528

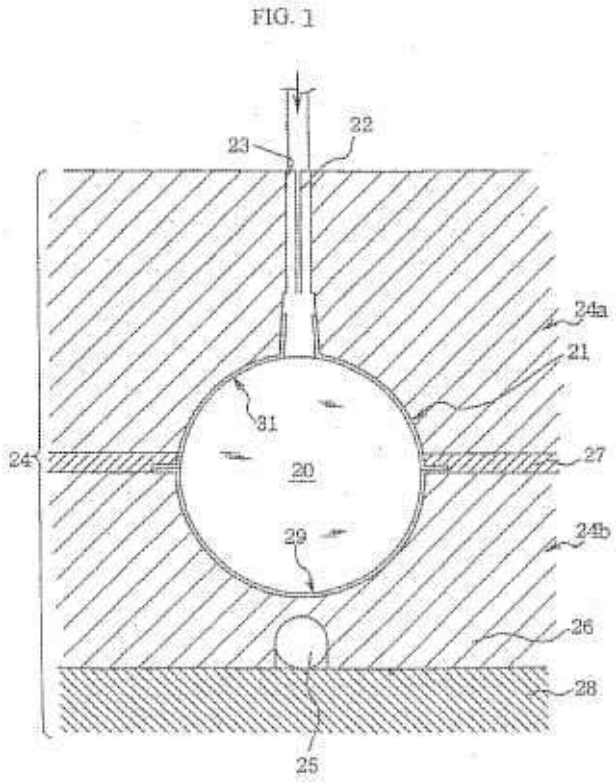
PNFP - EP1314939 A4 20070404

PR - WO2001JP07599 20010903; JP20000265037 20000901

AP - EP20010961311 20010903

DT - *; Rep

CT - || STSE (A4)
EP0326144 A2 19890802
[Y] (HOSHIZAKI ELECTRIC CO LTD [JP])
[Y] 1-12
* figures 2,10 *;
FR2495582 A1 19820611
[Y] (GLACES SURGELES STE EUROP [FR])
[Y] 1-12
* page 2, lines 21-30 *
* page 3, line 1 - page 4, line 33 *
* page 5, line 10 - page 6, line 7 *
* page 7, line 8 - page 9, line 14 *
* page 11, line 6- - page 13, line 16 *
* page 14, line 36 - page 16, line 14 *
* page 20, lines 25-35; figures 1-11,16,17 *;
JPH04106380 A 19920408
[Y] (NIPPON STEEL CORP)
[Y] 1-12
* abstract *;
JPH06346860 A 19941220
[Y] (SANKYO SEIKI SEISAKUSHO KK)
[Y] 11,12
* paragraphs [0003] - [0013]; figure 1d *;



JPS55158461 A 19801209
[DA] (GO KATSUO)
[DA] 1,6
* the whole document *;
US4669271 A 19870602
[A] (NOEL PAUL [CA])
[A] 2,7
* column 3, line 6 - column 4, line 18; figure 1 *;
EP0034930 A2 19810902
[A] (VENCRAFT CORP [US])
[A] 1,6
* page 2, paragraph 4 - page 5, paragraph 1 *
* page 7, paragraph 2 - page 8, paragraph 2 *;
JPH01123969 A 19890516
[DA] (DAIKIN IND LTD)
[DA] 1,6
* abstract *;
US4990169 A 19910205
[A] (BROADBENT JOHN A [US])
[A] 1,6
* the whole document *;
EP0448625 A1 19911002
[A] (BROAD RESEARCH [US])
[A] 1,6
* page 5, line 28 - page 7, line 33 *;
DE2626507 A1 19770113
[A] (KING SEELEY THERMOS CO)
[A] 1,6
* the whole document *;
US3940232 A 19760224
[A] (STOCK MALCOLM D)
[A] 2,7
* the whole document *

CCI - F25C1/18 ; F25C1/22

CCA - Y02P60/855

PA - (A1 A4)
SOMURA KATSUZO [JP]

TI - (A1 A4)
METHOD AND APPARATUS FOR PRODUCING STEREOSCOPIC ICE OF TRANSPARENT SPHERE OR THE LIKE

AB - (A1)
The process and equipment,

according to this invention, for manufacturing clear, solid **ice** of **spherical** and other shapes are capable of making clear ice balls and block ice of other shapes in the **mold** quickly, efficiently, and with effective energy utilization. This process is characterized in the steps of: a) preparing a **mold** for making ice balls and block ice of other shapes, which comprises an upper **mold** (24a) made of an insulating material and provided with a vertical injection hole (23) drilled therein and a water-injection nozzle (22) fitted in the hole; and a lower **mold** (24b) made of a water-freezing block (26) having coolant pipe (25) embedded therein; b) preparing for a domed lid (21a) or the lid of a different shape made of an insulating sheet, said lid (21a) having a shape that fits in with the surface shaped for the upper **mold** (24a) and being provided with a cylinder for being fitted into the vertical injection hole (23); and a shaped hemispherical cup (21b) of the same insulating sheet, which similarly fits in with the shaped surface of the lower **mold** (24b); c) assembling both halves of the **mold** (24) after the lid (21a) and the cup (21b) have been attached tightly to each other and placed in the **mold**; d) then, keeping the liquid to be frozen cooled at a predetermined temperature and spraying the liquid intermittently in the direction of the water-freezing block (26) that has been cooled to a predetermined freezing temperature; e) repeating the spraying operation to freeze the sprayed liquid in the **container**

(21), layer by layer, until clear ice balls (20) or block ice of other shapes are formed; and f) disassembling the halves of the **mold** under the ice-releasing effect, which the ice **container** (21) has on the ice-making **mold** (24), and immediately taking out the shaped ice balls (20) or the block ice of a different shape.
<IMAGE>

40/41 © EPODOC / EPO

PN - **DE2500230** A1 19750904

PR - SE19730012788 19740228

AP - DE19752500230 19750104

DT - *; Rep

CCI - **F25C1/24**

PA - LUNDGREN STIG GUNNAR INGEMAR

TI - Compound ice cube tray - doubles as storage bottle before conversion to ice tray

AB - An ice tray may be initially sold as a e.g. squash bottle with screw top. After use, the end wall is cut away and the **container** filled with water to a specified mark. This is just sufficient volume to fill all the semi-**spherical ice**-cube compartments. The whole tray/bottle is made from e.g. polyester and is thus a dual purpose **container**. The semi-**spherical ice** cube compartments may be conical shaped.

41/41 © EPODOC / EPO

PN - CA2420965 A1 20030228

PNFP - CA2420965 C 20070109

PR - JP20000265037 20000901; WO2001JP07599 20010903

AP - CA20012420965 20010903

DT - I

CCI - F25C1/18 ; F25C1/22

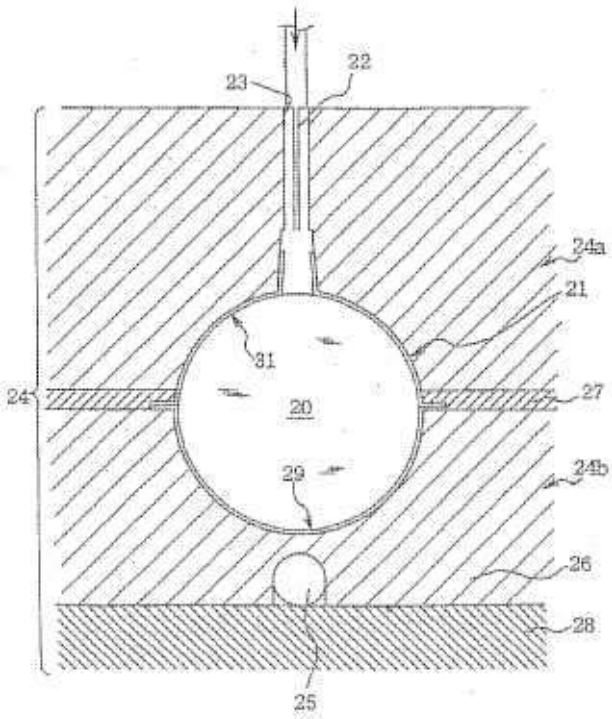
CCA - Y02P60/855

PA - (A1 C)
SOMURA KATSUZO [JP]

TI - (A1 C)
METHOD AND APPARATUS FOR PRODUCING CLEAR, SOLID **ICE** OF **SPHERICAL** AND OTHER SHAPES

AB - (A1)
A technique for producing stereoscopic ice of a transparent sphere or the li ke in a **mold** is used in a method and an apparatus for producing a stereoscopic shape such as a sphere by means of quickly-produced, high-efficiency heat. A **mold** (24) is constructed to include: a **mold** upper half (24a) as an insulatin g material layer having an injection vertical hole (23) assembled with a fountain nozzle (22); and a **mold** lower half (24b) as a regenerative disc (26) having a cooling-medium pipe (25) buried therein. a stereoscopic tray upper member (21a) and a stereoscopic tray lower member (21b) each having the injection vertical hole (23) and a fitting cylindrical portion (23a) are closely fitted on the molding faces of the upper and lower halves and are th en assembled. After this, a freezing liquid regulated to a predetermined temperature is intermittently injected toward the regenerative disc (26) cooled to the predetermined freezing

FIG. 1



temperature, to laminate and freeze the injected liquids sequentially thereby to produce a stereoscopic ice (20) of a transparent sphere or the like. By the **mold** separating effect of the tray members (21), the **mold** is disassembled, and the stereoscopic ice (20) of a completed sphere or the like is instantly extracted.

- (C)
The process and equipment, according to this invention, for manufacturing clear, solid **ice** of **spherical** and other shapes are capable of making clear ice balls and block ice of other shapes in the **mold** quickly, efficiently, and with effective energy utilization. This process may include: a) preparing a **mold**, which comprises an upper **mold** made of an insulating material and provided with a vertical injection hole drilled therein and a water-jet nozzle fitted in the hole; and a lower **mold** made of a water-freezing block having coolant pipe embedded therein; b) preparing a lid made of an insulating sheet, said lid having a shape that fits in with a surface shaped for the upper **mold** and being provided with a bottom flange and a cylinder for being fitted into the vertical injection hole; and a cup of a same insulating sheet, which similarly fits in with a shaped surface of the lower **mold** and is provided with a top flange; c) assembling the upper **mold** and the lower **mold** of the **mold** after the lid and the cup have been attached tightly to each other to form a **container** and placed in the **mold**; d) keeping liquid to be frozen

cooled at a predetermined temperature and spraying the liquid intermittently in a direction of a water-freezing block that has been cooled to a predetermined freezing temperature; e) repeating a spraying operation to freeze the sprayed liquid in the **container**, layer by layer, until clear ice is formed; and f) disassembling the **mold** under an ice-releasing effect, which the **container** has on the **mold**, and immediately taking out the ice.

[SS 3]