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(54) **ICE MOLD SUPPLY SYSTEM FOR REFRIGERATION APPLIANCES**

EISFORMZUFUHRSYSTEM FÜR KÜHLGERÄTE

SYSTEME DE DISTRIBUTION DE MOULE A GLACE POUR APPAREILS DE REFRIGERATION

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Description

Field of the Invention

[0001] The present invention refers to a system to facilitate the filling of the ice molds provided in the freezer compartment of a refrigeration appliance, generally a combined refrigerator comprising a freezer compartment and a refrigeration compartment, which are separated by an intermediary wall and closed by respective front doors.

Prior Art

[0002] There are known from the state of art different systems for mounting the ice molds inside the freezer compartment of a refrigeration appliance.

[0003] In some of these arrangements, the ice molds are simply placed on a shelf or on the bottom of the freezer compartment.

[0004] In other constructions, the ice molds take the form of compartments that slide on rails affixed to the internal structure of the freezer compartment.

[0005] There are also known the arrangements in which the ice molds are rotatably seated on frames sliding on rails provided in the structure of the freezer compartment, in order to be rotated around their longitudinal axis and preferably submitted to a certain torsion upon completion of the rotation of about 90°, in order to release the load of ice cubes inside an ice cube collecting box which is also slidingly seated on rails and positioned under the ice molds. An arrangement of this type is described in Brazilian patent documents PI960391-9 and PI9603902-7. Another ice mold supply system is known from WO02/0522057.

[0006] Independently of the characteristics of the prior art arrangements concerning the procedures for removing the ice cubes from the molds and for storing said ice cubes inside the freezer compartment, the prior art mounting systems require the ice molds to be manually supplied, generally outside the freezer compartment, and to be subsequently carried to be positioned in the determined place, which can be defined by a shelf or by rails inside the freezer compartment. This operation of supplying the ice molds is uncomfortable, often resulting in water spillage or in said molds being only partially filled. Furthermore, in the cases in which the water supply is effected outside the freezer compartment, the user has to carefully carry it to the mounting place, trying to avoid the frequent and almost inevitable water spillage.

[0007] Besides the deficiency mentioned above, these known mounting systems are defined in the project, not allowing the user to modify their operational characteristics, as a function of the usage particularities to be imparted to the ice molds. The known mounting systems are not versatile, forcing the user to utilize the molds according to a single pattern defined by the manufacturer.

[0008] Object of the Invention

[0009] By reason of the disadvantages mentioned above, it is a generic object of the present invention to provide an ice mold supply system for refrigeration appliances, which promotes a correct, reliable and automatic supply, with no water spillage, of the molds with an adequate volume of water, when said molds are already positioned in their mounting places inside a freezer compartment, and which allows the ice molds to be manually and selectively rotated in their mounting places, in order to gravitationally release the ice cubes to the interior of a collecting box which can be detached from the inside of the freezer compartment.

Disclosure of the Invention

[0010] In order to comply with the object above, the invention provides an ice mold supply system for refrigeration appliances of the type comprising a freezer compartment, in whose interior is provided a support means, carrying at least one pair of median rails on which is slidingly and detachably seated at least one ice mold.

[0011] According to the invention, the support means carries at least one pair of upper rails, on which is slidingly and detachably seated a reservoir which is dimensioned to contain, when completely full, a volume of water corresponding to that required for adequately supplying the ice molds disposed immediately below, said reservoir being inferiorly provided with a discharge nozzle, positioned above the ice mold immediately below and in which is mounted an outlet valve which is constantly and resiliently forced to a closed position and automatically displaced to an open position when the reservoir is mounted to the support means.

[0012] In a preferred constructive form, the ice mold has its opposite ends horizontally rotatably seated on a frame which is slidingly and detachably seated on one of the pairs of median rails and upper rails, the ice mold being manually rotated around its longitudinal axis from a rest position, for freezing the volume of water supplied therein, to an inclined position for gravitationally releasing the ice cubes and in which the ice mold is submitted to a certain torsion.

[0013] The support means may further incorporate, particularly by applying the above-mentioned construction that uses rotatable ice molds, at least one pair of lower rails on which is slidingly and detachably seated an ice cube collecting box which is disposed immediately below at least one ice mold, in order to receive the ice cubes that are gravitationally released from an ice mold, which can be the one disposed immediately above which is displaced to the inclined position and submitted to a certain degree of torsion.

Brief Description of the Drawings

[0014] The invention will be described below, with reference to the enclosed drawings, given only by way of example and in which:

Figure 1 is an exploded perspective view of the present supply system in an embodiment operatively associated with a sliding frame carrying a pair of ice molds and with a lower collecting box;

Figure 2 is a front perspective view of the assembly illustrated in figure 1 when mounted in the freezer compartment of a partially illustrated refrigerator;

Figure 3 is a median longitudinal vertical sectional view of the assembly illustrated in figure 2;

Figure 4 is a cross-sectional view of a reservoir of the present supply system; and

Figure 5 is an enlarged front view of the supply system illustrated in figure 2.

Detailed Description of the Invention

[0015] As illustrated, the present supply system is applied to refrigeration appliances of the type comprising a freezer compartment 1, which can be defined in the upper portion of a cabinet, in whose lower portion is formed a refrigeration compartment 2, as exemplarily illustrated and which is separated from the freezer compartment 1 by an intermediary wall 3.

[0016] The supply system of the invention comprises a support means 10, which can take the form of a frame made of injected plastic, presenting a cross section in the form of an inverted "U", and having an upper wall 11 from which vertically depend two opposite lateral walls 12, the longitudinal extension of said frame being dimensioned so as to be mounted inside the freezer compartment 1.

[0017] The support means 10 carries, internally and along the extension of its lateral walls 12, a pair of upper rails 20, two pairs of median rails 30, and a pair of lower rails 40, said pairs of rails being disposed in horizontal planes that are vertically spaced from each other by a certain gap.

[0018] It should be understood that the distribution of the pairs of rails mentioned above is illustrated only exemplarily, and that other arrangements with a different number of pairs of rails could be used, as long as they allow defining at least an upper level, a median level, and a lower level for supporting the elements to be described ahead.

[0019] The rails may be constructed in different manners, as separated pieces affixed to the support means 10, or as pieces incorporated to the lateral walls 12 of the support means 10.

[0020] In a constructive form according to figure 5, on the pair of upper rails 20 is slidably and detachably seated a reservoir 50 which is dimensioned to contain, when filled up, a volume of water corresponding to that required for adequately supplying an ice mold 60 disposed immediately below, as described below.

[0021] The reservoir 50, which is generally molded in plastic material, comprises: a body 51 in the form of a tray that is slidably seated on the pair of upper rails 20, a lid 52 in the form of a plate to be hermetically and detachably mounted to the body 51, in order to define an upper wall for the latter; and a small overlid 53 provided in the lid 52 and which is manually operated between an open position, for filling the reservoir 50, and a closed position, hermetically enclosing the volume of water inside the reservoir 50.

[0022] The overlid 53 is constructed in such a way as to facilitate the filling of the reservoir 50 and to provide the user with a visual indication of the water level to be reached for the adequate supply of a respective ice mold 60.

[0023] The reservoir 50 is inferiorly provided with a discharge nozzle 55 to be positioned, upon mounting the reservoir 50 to the support means 10, above a respective ice mold 60 immediately below, and in the discharge nozzle 55 is mounted an outlet valve 56 which is constantly and resiliently forced to a closed position and automatically displaced to an open position upon mounting the reservoir 50 in the support means 10.

[0024] It should be understood that the outlet valve 56 could be constructed to be opened only as a function of a specific operation made by the user, after the reservoir 50 has been correctly positioned inside the support means 10. In this case, the opening of the outlet valve 56 is not automatic.

[0025] In the embodiment in which the automatic opening of the outlet valve 56 is provided, the latter incorporates an actuating rod 57 disposed under the reservoir 50 and which is designed to interfere with the support means 10, generally with the closest upper rail 20, in order to actuate the outlet valve 56 when the reservoir 50 is introduced in the support means 10, promoting the displacement of the outlet valve 56 to the open position (see figure 3) and the consequent supply of the ice mold 60 disposed immediately below.

[0026] In the illustrated construction, the body 51 of the reservoir 50 is medianly divided in two body portions 51a, 51b, each incorporating a discharge nozzle 55 provided with an outlet valve 56 positioned above the respective ice mold.

[0027] The construction described above for the reservoir 50 is employed when, under the latter, two ice molds 60 are positioned side by side, each having its opposite ends horizontally rotatably seated on a frame 70 which is slidably and detachably seated on at least one of the two pairs of median rails 30. Thus, each ice mold 60 can be rotated around its longitudinal axis, from a rest position, for freezing the water volume supplied therein, to an inclined position, for gravitationally releasing the ice cubes and in which the ice mold 60 is submitted to a certain torsion.

[0028] It should be understood that the frame 70 can rotatably support only one ice mold 60, in which situation the body 51 of the reservoir 50 can be formed in a single piece provided with one or more discharge nozzles 55, each having a respective outlet valve 56.

[0029] Still in accordance with figure 5, the pair of lower rails 40 slidably and detachably support an ice cube col-

lecting box 80 which remains in a mounted condition, disposed immediately below the ice mold or molds 60 which are rotatably seated on the frame 70 in order to receive the ice cubes being gravitationally released from the ice molds 60 when the latter are rotated to the inclined position.

Claims

1. An ice mold supply system, for refrigeration appliances, of the type comprising a freezer compartment (1), in whose interior is provided a support means (10) carrying at least one pair of median rails (30), on which is slidingly and detachably seated at least one ice mold (60), **characterized in that** the support means (10) carries at least one pair of upper rails (20), on which is slidingly and detachably seated a reservoir (50) which is dimensioned to contain, when completely full, a volume of water corresponding to that required for adequately supplying the ice molds (60) disposed immediately below, said reservoir (50) being inferiorly provided with a discharge nozzle (55), positioned above the ice mold (60) immediately below and in which is mounted an outlet valve (56) which is constantly and resiliently forced to a closed position and automatically displaced to an open position when the reservoir (50) is mounted in the support means (10).
2. The system as set forth in claim 1, **characterized in that** the support means (10) further incorporates at least one pair of lower rails (40) on which is slidingly and detachably seated an ice cube collecting box (80) disposed immediately below at least one ice mold (60).
3. The system as set forth in claim 1, **characterized in that** the ice mold (60) has its opposite ends horizontally rotatably seated on a frame (70) which is slidingly and detachably seated on at least one of the pairs of median rails (30) and upper rails (20), in order to be manually rotated around its longitudinal axis from a rest position, for freezing the volume of water supplied therein, to an inclined position, for gravitationally releasing the ice cubes and in which the ice mold (60) is submitted to a certain torsion.
4. The system as set forth in claim 3, **characterized in that** the support means (10) carries: at least one pair of upper rails (20) supporting the reservoir (50), at least one pair of median rails (30) carrying a frame (70) on which is rotatably seated at least one manually rotatable ice mold (60); and at least one pair of lower rails (40) supporting the collecting box (80).
5. The system as set forth in claim 1, **characterized in that** the reservoir (50) comprises: a body (51) in

the form of a tray seated on at least one pair of upper rails (20) of the support means (10); a lid (52) which is detachably and hermetically mounted onto the body (51), in order to define an upper wall of the latter; and an overlid (53), provided on the lid (52) and which is disposed in such a way as to allow supplying the reservoir and visually indicating the adequate supply of the respective ice mold (60), the outlet valve (56) being mounted to a lower wall of the reservoir (50).

6. The system as set forth in claim 5, **characterized in that** the outlet valve (56) incorporates an actuating rod (57) which is designed so as to interfere with the support means (10) when the reservoir (50) is mounted in the support means (10), in order to provoke the displacement of the outlet valve (56) to the open position and the consequent supply of the ice mold (60) disposed immediately below.
7. The system as set forth in claim 5, **characterized in that** the body (51) of the reservoir (50) is medianly divided in two body portions (51a, 51b), each incorporating a discharge nozzle (55) which is provided with an outlet valve (56) positioned above a respective ice mold (60), with the opposite ends thereof being horizontally rotatably seated on a frame (70) which is slidingly and detachably seated on at least one pair of median rails (30) of the support means (10).
8. The system as set forth in claim 1, **characterized in that** the support means (10) comprises a frame with a cross section in the form of an inverted "U", with its lateral walls (12) internally affixing the pairs of upper rails (20), median rails (30), and lower rails (40), and with its upper wall (11) being attached against an upper wall of the freezer compartment (1).

Patentansprüche

1. Eisform-Befüllungssystem für Kühlgeräte des Typs, der ein Gefrierfach (1) besitzt, in dessen Innenraum ein Unterstützungsmittel (10) vorgesehen ist, das wenigstens ein Paar Mittelschienen (30) trägt, auf denen wenigstens eine Eisform (60) gleitend und abnehmbar sitzt, **dadurch gekennzeichnet, dass** das Unterstützungsmittel (10) wenigstens ein Paar oberer Schienen (20) trägt, auf denen ein Vorratsbehälter (50) gleitend und abnehmbar sitzt, der so bemessen ist, dass er, wenn er vollständig gefüllt ist, ein Wasservolumen enthält, das jenem entspricht, das für die geeignete Befüllung der direkt darunter angeordneten Eisformen (60) erforderlich ist, wobei der Vorratsbehälter (50) an seiner Unterseite mit einer Entleerungstülle (55) versehen ist, die über der direkt darunter befindlichen Eisform (60) positioniert ist

- und in der ein Auslassventil (56) angebracht ist, das dauernd und elastisch in eine geschlossene Stellung gedrängt wird und automatisch in eine geöffnete Stellung verlagert wird, wenn der Vorratsbehälter (50) in dem Unterstützungsmittel (10) angebracht wird.
2. System nach Anspruch 1, **dadurch gekennzeichnet, dass** das Unterstützungsmittel (10) ferner wenigstens ein Paar unterer Schienen (40) umfasst, auf denen ein Eiswürfelsammelkasten (80), der direkt unter wenigstens einer Eisform (60) angeordnet ist, gleitend und abnehmbar sitzt.
3. System nach Anspruch 1, **dadurch gekennzeichnet, dass** die Eisform (60) mit ihren gegenüberliegenden Enden horizontal drehbar auf einem Rahmen (70) sitzt, der seinerseits auf dem Paar mittlerer Schienen (30) und/oder dem Paar oberer Schienen (20) gleitend und abnehmbar sitzt, um aus einer Ruhelageposition, in der das ihm zugeführte Wasservolumen gefroren wird, manuell in eine geneigte Position gedreht zu werden, um durch die Eiswürfel die Schwerkraft freizugeben, wobei in dieser Position die Eisform (60) einer bestimmten Torsion unterworfen wird.
4. System nach Anspruch 3, **dadurch gekennzeichnet, dass** das Unterstützungsmittel (10) trägt: wenigstens ein Paar oberer Schienen (20), die den Vorratsbehälter (50) unterstützen, wenigstens ein Paar mittlerer Schienen (30), die einen Rahmen (70) tragen, auf dem wenigstens eine manuell drehbare Eisform (60) drehbar sitzt; und wenigstens ein Paar unterer Schienen (40), die den Sammelkasten (80) unterstützen.
5. System nach Anspruch 1, **dadurch gekennzeichnet, dass** der Vorratsbehälter (50) umfasst: einen Körper (51) in Form eines Tablett, das auf wenigstens einem Paar oberer Schienen (20) des Unterstützungsmittels (10) sitzt; einen Deckel (52), der auf den Körper (51) abnehmbar und abdichtend angebracht ist, um eine obere Wand des Letzteren zu definieren; und einen Überdeckel (53), der auf dem Deckel (52) vorgesehen ist und in der Weise angeordnet ist, dass er die Befüllung des Vorratsbehälters und die visuelle Anzeige der geeigneten Befüllung der jeweiligen Eisform (60) zulässt, wobei das Auslassventil (56) an einer unteren Wand des Vorratsbehälters (50) angebracht ist.
6. System nach Anspruch 5, **dadurch gekennzeichnet, dass** das Auslassventil (56) einen Betätigungsstab (57) umfasst, der so entworfen ist, dass er mit dem Unterstützungsmittel (10) in Wechselwirkung tritt, wenn der Vorratsbehälter (50) in dem Unterstützungsmittel (10) angebracht wird, um die Verlagerung des Auslassventils (56) in die geöffnete Stellung und die daraus resultierende Befüllung der Eisform (60), die unmittelbar darunter angeordnet ist, hervorzurufen.
7. System nach Anspruch 5, **dadurch gekennzeichnet, dass** der Körper (51) des Vorratsbehälters (50) in seiner Medianebene in zwei Körperabschnitte (51a, 51b) unterteilt ist, wovon jeder eine Entleerungstülle (55) aufweist, die mit einem Auslassventil (56) versehen ist, das über einer entsprechenden Eisform (60) positioniert ist, wobei die gegenüberliegenden Enden hiervon auf einem Rahmen (70), der auf wenigstens einem Paar mittlerer Schienen (30) des Unterstützungsmittels (10) gleitend und abnehmbar sitzt, horizontal drehbar sitzen.
8. System nach Anspruch 1, **dadurch gekennzeichnet, dass** das Unterstützungsmittel (10) einen Rahmen mit einem Querschnitt in Form eines umgedrehten "U" umfasst, an dessen Seitenwänden (12) innen die Paare oberer Schienen (20), mittlerer Schienen (30) und unterer Schienen (40) befestigt sind und dessen obere Wand (11) an einer oberen Wand des Gefrierfachs (1) befestigt ist.

Revendications

1. Système d'alimentation de bacs à glaçons, pour appareils de réfrigération, du type comprenant un compartiment de congélation (1), à l'intérieur duquel est disposé un moyen de support (10) supportant au moins une paire de rails centraux (30), sur lesquels repose, coulissant et amovible, au moins un bac à glaçons (60), **caractérisé en ce que** le moyen de support (10) supporte au moins une paire de rails supérieurs (20), sur lesquels repose, coulissant et amovible, un réservoir (50) qui est dimensionné pour contenir, une fois complètement plein, un volume d'eau correspondant à celui requis pour alimenter de manière appropriée les bacs à glaçons (60) disposés juste en dessous, ledit réservoir (50) étant pourvu, en sa partie inférieure, d'une buse de décharge (55), positionnée au-dessus du bac à glaçons (60) se trouvant juste en dessous et dans laquelle est montée une vanne de sortie (56) qui est forcée, constamment et élastiquement, jusqu'à une position fermée et est automatiquement déplacée jusqu'à une position ouverte lorsque le réservoir (50) est monté dans le moyen de support (10).
2. Système selon la revendication 1, **caractérisé en ce que** le moyen de support (10) inclut, en outre, au moins une paire de rails inférieurs (40) sur lesquels repose, coulissant et amovible, un bac collecteur de glaçons (80) disposé juste en dessous d'au moins un bac à glaçons (60).

3. Système selon la revendication 1, **caractérisé en ce que** le bac à glaçons (60) a ses extrémités opposées reposant, en rotation horizontale, sur un châssis (70) qui repose, coulissant et amovible, sur au moins l'une des paires de rails centraux (30) et rails supérieurs (20), afin d'être tourné manuellement autour de son axe longitudinal depuis une position de repos, pour congeler le volume d'eau fourni en son sein, jusqu'à une position inclinée, pour libérer par gravité les glaçons, et dans laquelle le bac à glaçons (60) est soumis à une certaine torsion. 5 10

4. Système selon la revendication 3, **caractérisé en ce que** le moyen de support (10) supporte : au moins une paire de rails supérieurs (20) supportant le réservoir (50), au moins une paire de rails centraux (30) supportant un châssis (70) sur lequel repose, en rotation, au moins un bac à glaçons (60) à rotation manuelle ; et au moins une paire de rails inférieurs (40) supportant le bac collecteur (80). 15 20

5. Système selon la revendication 1, **caractérisé en ce que** le réservoir (50) comprend: un corps (51) sous la forme d'un plateau reposant sur au moins une paire de rails supérieurs (20) du moyen de support (10) ; un couvercle (52) qui est monté, hermétiquement et de manière amovible, sur le corps (51), afin de définir une paroi supérieure de ce dernier ; et un surcouvercle (53), disposé sur le couvercle (52) et qui est disposé de manière à permettre l'alimentation du réservoir, et indiquant visuellement l'alimentation adéquate du bac à glaçons (60) respectif, la vanne de sortie (56) étant montée sur une paroi inférieure du réservoir (50). 25 30 35

6. Système selon la revendication 5, **caractérisé en ce que** la vanne de sortie (56) inclut une tige d'actionnement (57) qui est conçue pour interférer avec le moyen de support (10) lorsque le réservoir (50) est monté dans le moyen de support (10), afin de provoquer le déplacement de la vanne de sortie (56) jusqu'à la position ouverte et l'alimentation résultante du bac à glaçons (60) disposé juste en dessous. 40

7. Système selon la revendication 5, **caractérisé en ce que** le corps (51) du réservoir (50) est divisé centralement en deux parties de corps (51a, 51b), chacune incluant une buse de décharge (55) qui est pourvue d'une vanne de sortie (56) positionnée au-dessus d'un bac à glaçons (60) respectif, les extrémités opposées de celui-ci reposant, en rotation horizontale, sur un châssis (70) qui repose, coulissant et amovible, sur au moins une paire de rails centraux (30) du moyen de support (10). 45 50 55

8. Système selon la revendication 1, **caractérisé en ce que** le moyen de support (10) comprend un châssis ayant une section transversale sous la forme d'un

"U" inversé, ses parois latérales (12) fixant intérieurement les paires de rails supérieurs (20), rails centraux (30) et rails inférieurs (40), et sa paroi supérieure (11) étant fixée contre une paroi supérieure du compartiment de congélation (1).

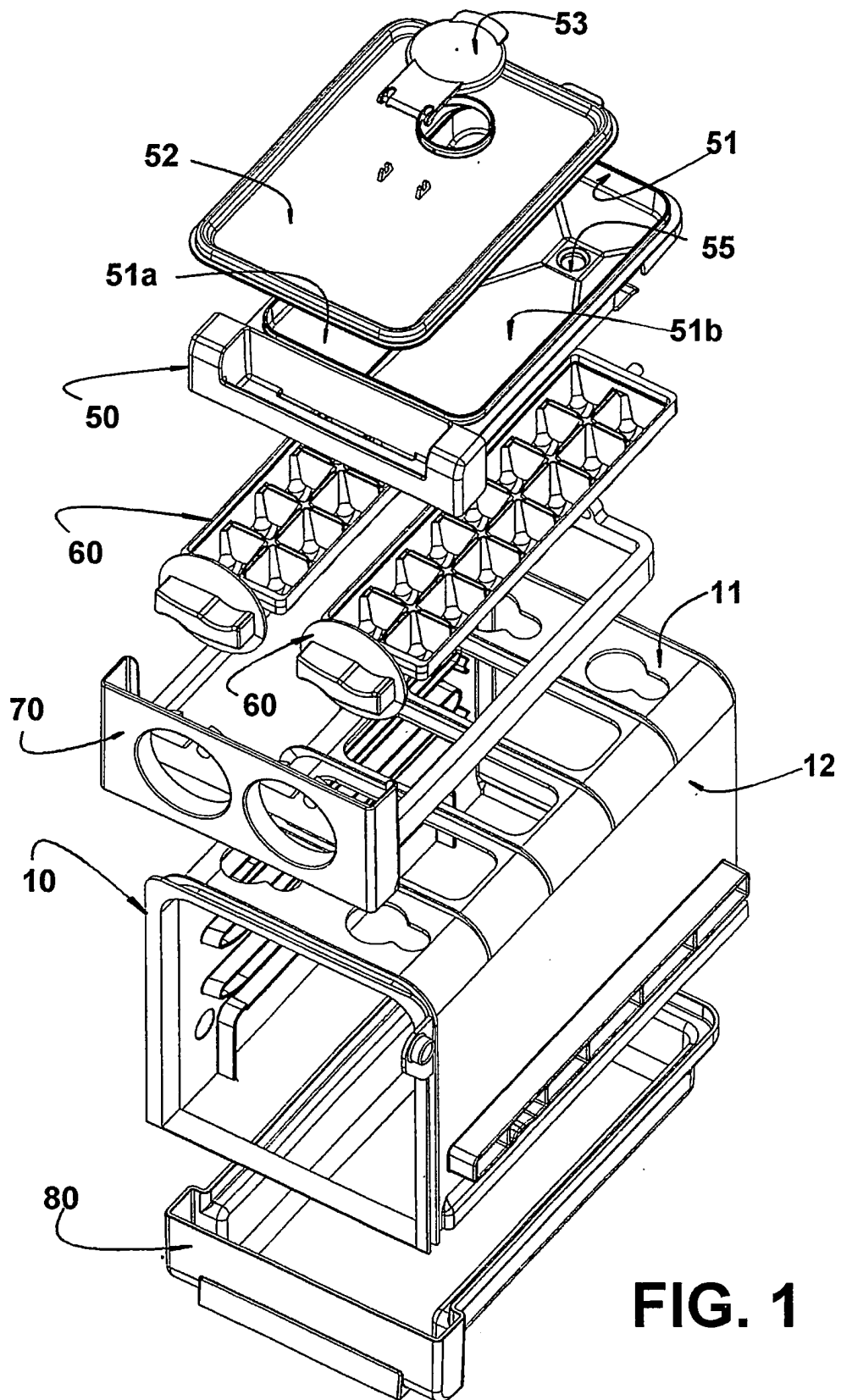


FIG. 1

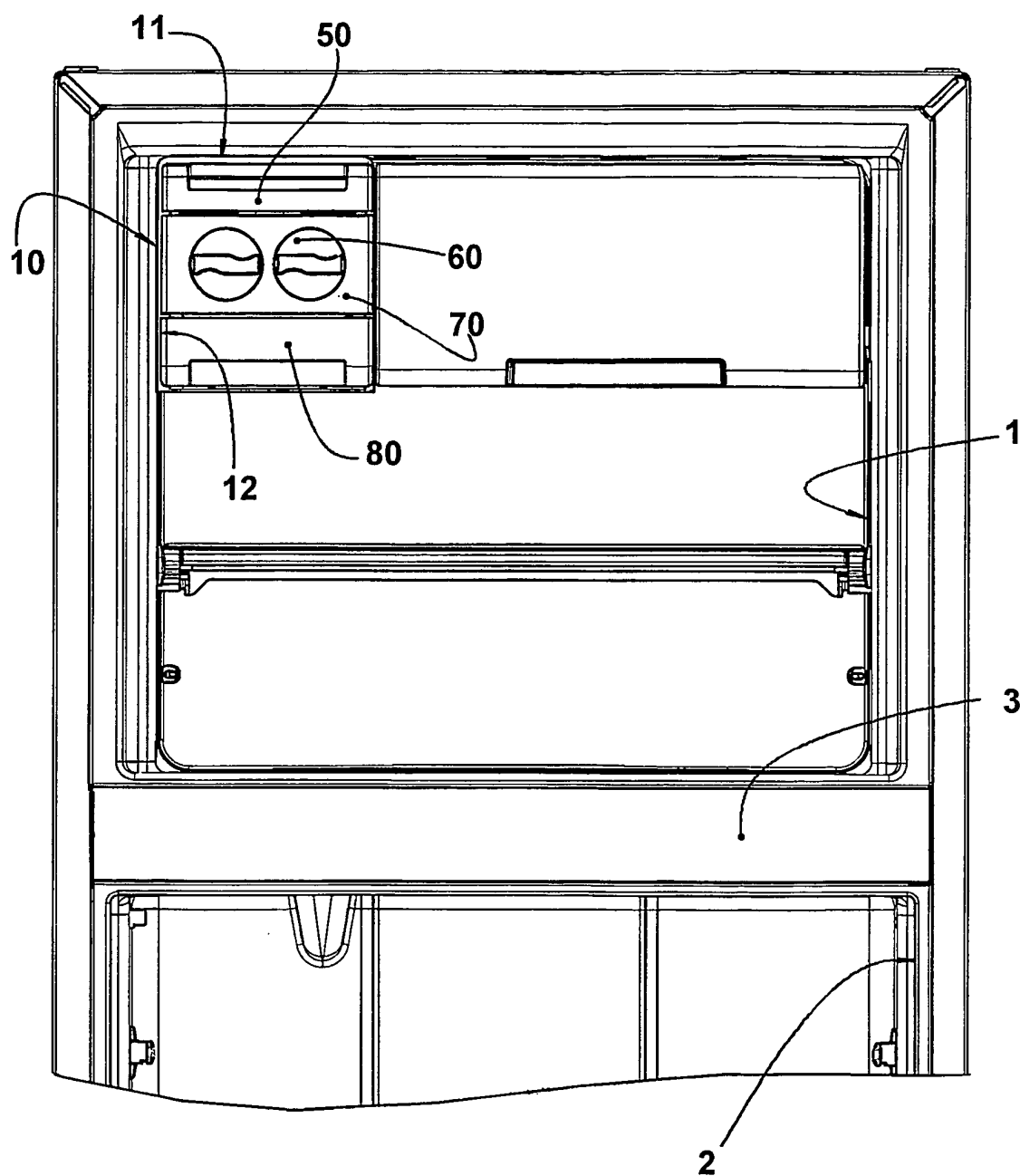


FIG. 2

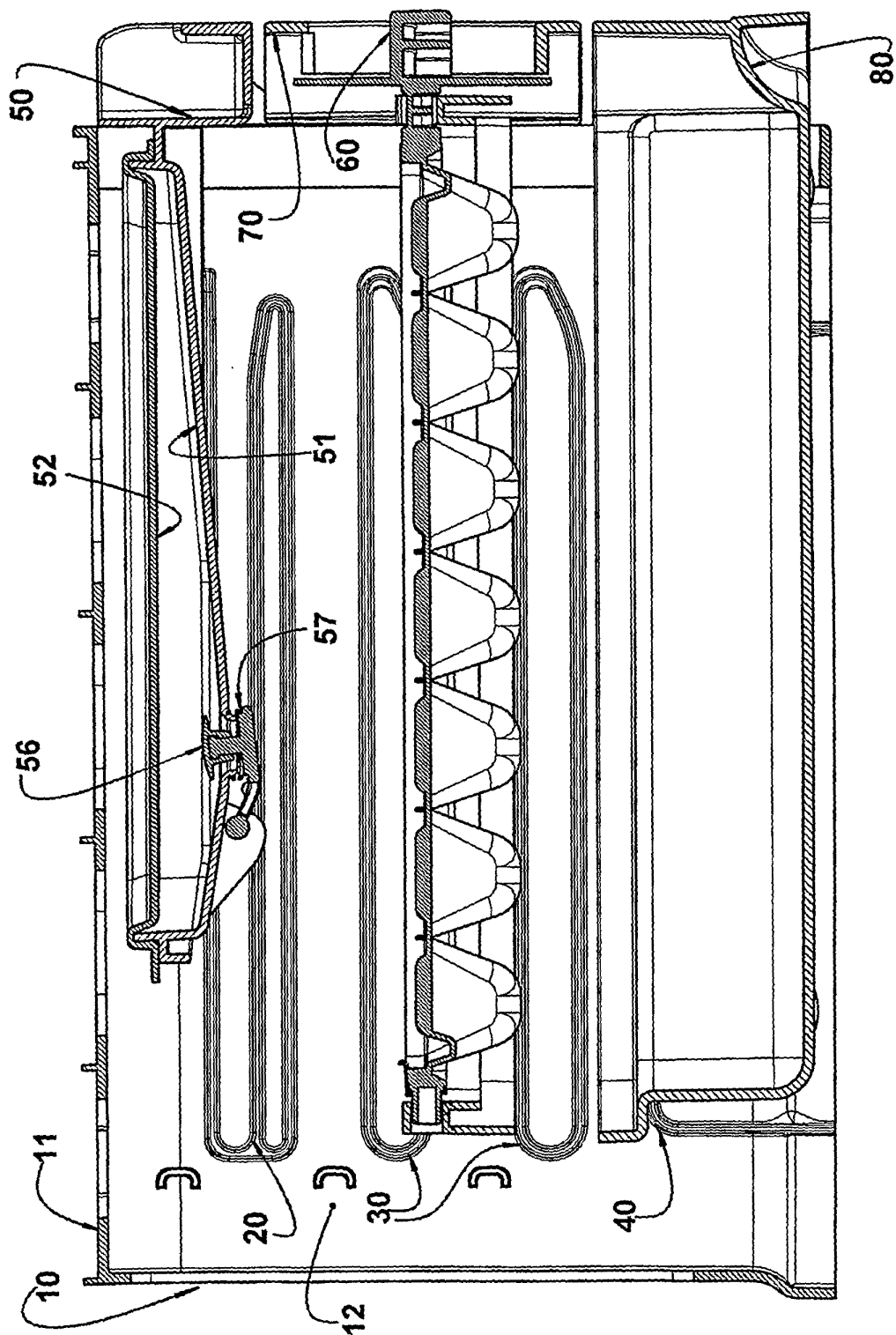


FIG. 3

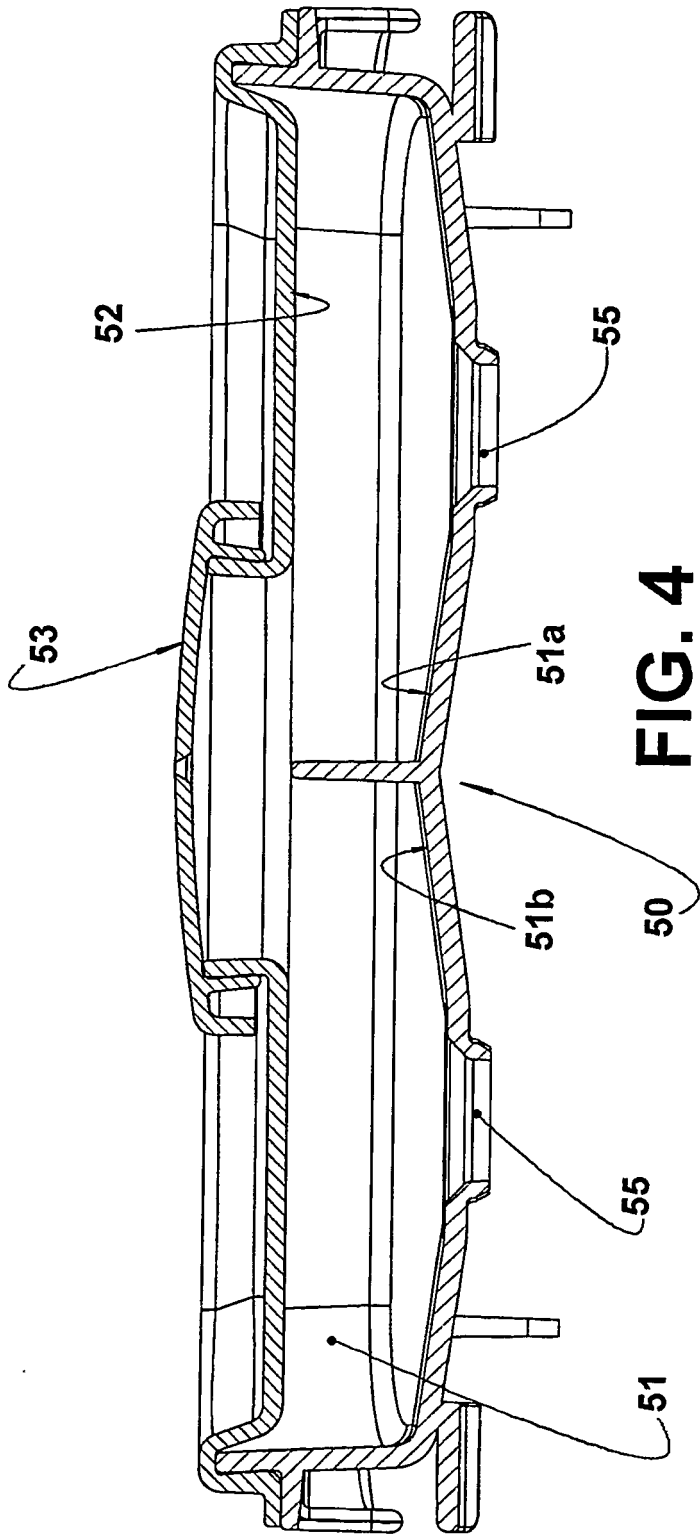


FIG. 4

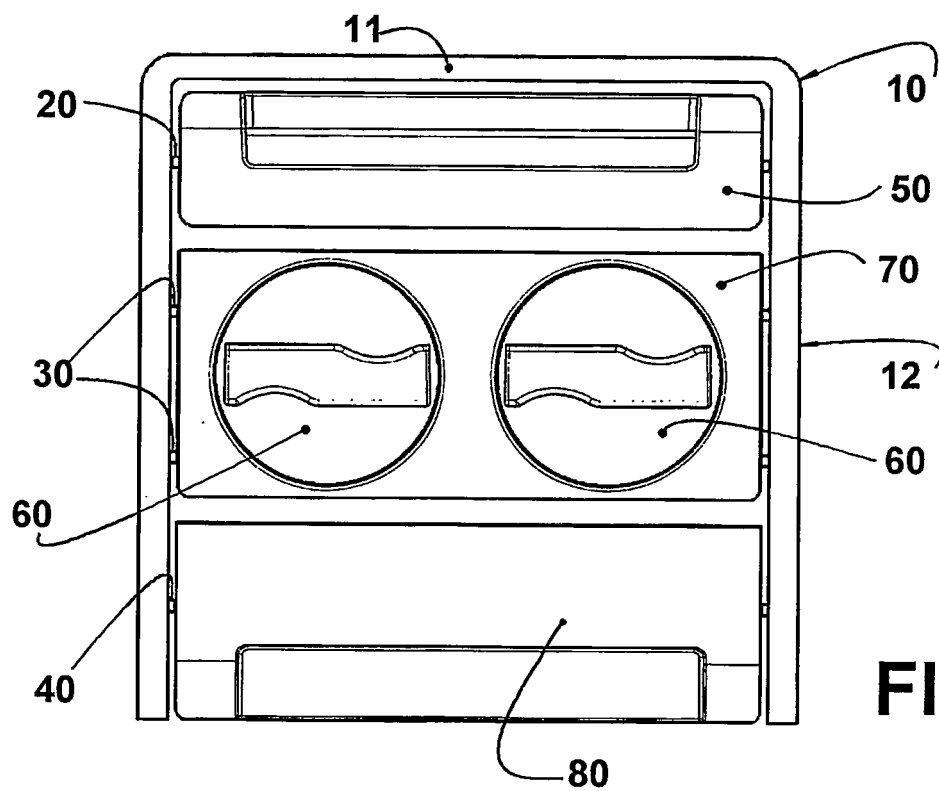


FIG. 5