

(19) **DANMARK**

(10) **DK/EP 3558841 T3**



Patent- og
Varemærkestyrelsen

(12) **Oversættelse af
europæisk patentskrift**

-
- (51) Int.Cl.: **B 65 D 51/20 (2006.01)** **B 65 D 55/08 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2021-03-08**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2021-02-17**
- (86) Europæisk ansøgning nr.: **17822485.3**
- (86) Europæisk indleveringsdag: **2017-12-19**
- (87) Den europæiske ansøgnings publiceringsdag: **2019-10-30**
- (86) International ansøgning nr.: **NL2017050851**
- (87) Internationalt publikationsnr.: **WO2018117825**
- (30) Prioritet: **2016-12-20 WO PCT/NL2016/050898**
- (84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**
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- (54) Benævnelse: **Anti-forfalskningsbeholder**
- (56) Fremdragne publikationer:
WO-A1-2013/125941
WO-A1-2014/084721
WO-A1-2016/148587
WO-A2-2014/072455
GB-A- 2 506 429
US-A1- 2016 027 021
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DESCRIPTION

Field of the invention

[0001] The present invention relates to a container for food, especially for infant formula food, and more especially an anti-counterfeit container for infant formula food.

Background art

[0002] Food products to be sold need to be stored in packages that provide the necessary preservation conditions. The authenticity of the products is of utmost importance, so that the products that reach the consumers are not counterfeited.

[0003] Different authentication techniques are known in the art, such as anti-tampering means placed on the outside of the package and that need to be broken in order to open the package, and codes that are placed outside the package and that can be scanned to receive information about the product.

[0004] However, the anti-tampering means could be imitated and provided again in a product already opened and refilled with a different product from the original, and even if codes are used, these could be copied and used in another packaging. These are mere examples of different ways in which it would be possible to counterfeit products.

[0005] Such counterfeiting risks are daily faced by the food industry. These counterfeit actions can be date code fraud, label replacement, packaging reuse or content replacement, and imitation, among others. There are in the art authentication mechanisms that are quite successful in avoiding counterfeiting and in providing a good safety level in a cost-effective manner. Still, human ingenuity might make it possible to breach these safety measures.

[0006] There is therefore a need to provide cost-effective authentication and anti-counterfeit features to food containers that minimize the risk of fraud and that therefore further improve safety of the products that reach the consumers.

WO 2013/125941 A1 discloses a packaging for a powdered material comprising a container for receiving the material, having a base and a peripheral wall with a top edge, a membrane being attached at the top edge of the peripheral wall for separating the powdered material in the container from the environment, a lid assembly comprising a circumferential rim for connection over the top edge of the peripheral wall and defining a wide access opening, and a lid, hingedly attached to the rim for reclosing the access opening. The lid assembly comprises a circumferential lip extending inwardly of the peripheral wall and downwardly into the container to beyond the top edge thereof, such that the membrane is stretched by the lip in order to form a seal between the lip and the peripheral wall. The membrane further comprises an opening

region lying inwardly of the lip.

WO 2016/148587 A1 relates to a system for, or method of, packaging a product within a packaging bag, wherein the packaging bag includes an inner liner and an outer liner. The method includes the steps of marking the inner liner with a first marking means, filling the bag with the product, and subsequently marking the outer liner with a second marking means. The markings may be machine readable and/or randomly generated and stored in a database. The system may further include a machine reader, capable of accessing the database, and capable of reading the markings on the inner liner and/or the outer liner, to thus determine if an outer liner subsequently removed from an inner liner is/was the same outer liner associated with the same inner liner, at the time when the bag was filled and/or packaged.

US 6 446 794 B1 relates to a packaging unit designed to absorb and/or adsorb liquid that is being transported or was spilled or was released. The packaging unit has at least one sealing multilayer comprising a first water soluble film and an absorbent/adsorbent material. When the liquid contacts the water soluble film, the liquid passes through the water soluble film. When the liquid contacts the absorbent/adsorbent material, the absorbent/adsorbent material immobilizes the liquid material. This immobilization prevents the liquid from escaping from the packaging container.

Summary of the invention

[0007] It is an object of the present invention to provide improved authentication and anti-counterfeit features to food containers, preferably to infant formula food containers.

[0008] According to the present invention, a container for food such as infant food is provided, comprising a cover for closing the container; an outer scannable code provided on the container so as to be scannable from the outside (e.g. without opening the cover or unfastening any tamper-proof closure means); a gas-tight membrane seal inside the container for sealing a food content of the container prior to use; and an inner scannable code provided on the membrane seal so as to be only scannable after opening the container.

[0009] This container provides an improved authentication mechanism, because its layered approach consists of an outer scannable code placed on the outer surface of the container, and an inner code placed inside the container on a gas-tight membrane seal that protects the product. This structure adds extra security levels because the inner scannable code and the gas-tight membrane seal on which it is placed are difficult to counterfeit.

[0010] In an embodiment of the invention, the gas-tight membrane seal comprises a tear strip configured to be torn along a tear path and to leave a part of the membrane seal in the container. This opening mechanism leaves a part of the membrane seal in the container, and the membrane seal is therefore not completely removed when opened, which is advantageous because once it has been opened it is extremely difficult to remove the rest and replace it with a new one without this being noticeable.

[0011] In an embodiment of the invention, the gas-tight membrane seal comprises a plastic, metal or plastics-metal foil.

[0012] In an embodiment of the invention, the gas-tight membrane seal is attached to the container by ultrasonic welding. In an embodiment of the invention, the gas-tight membrane seal is attached to the container by induction sealing. These sealing mechanisms have the advantage of not requiring glue, which is preferred when working with infant formula food.

[0013] In an embodiment of the invention, the gas-tight membrane seal has a surface area of at least 50 square centimetres, or even at least 100 square centimetres.

[0014] In an embodiment of the invention, the inner scannable code is preferably located on the outer side of the membrane seal facing away from the container content.

[0015] In a further embodiment of the invention, the inner scannable code is placed on the membrane seal outside of the tear path.

[0016] In an embodiment of the invention, the inner scannable code is a laser marked visible code on the membrane seal. In an embodiment of the invention, the outer scannable code is a laser marked visible code on the outer surface of the container. Laser marking has an advantage over other marking techniques such as inkjet, which can be erased, in that the laser beam removes the top layer of the container material and it cannot be changed easily. In an alternative embodiment wherein inkjet printing is used, the scannable inkjet code is covered by a transparent finishing layer to protect the inkjet marking from being erased.

[0017] In an embodiment of the invention, the inner scannable code is placed on the gas-tight membrane seal outside of the tear path. In particular, the inner scannable code may be provided on a part of the gas-tight membrane seal on a side of the tear path opposite a container edge, so that the inner scannable code is on a part of the gas-tight membrane seal that will be removed when the container is opened.

[0018] In an embodiment of the invention, the inner and outer scannable codes are associated with each other. For example, a database may store that the two codes as belonging together. This ensures that the outer code indeed relates to the same product that is placed within the membrane seal in which the inner code is located.

[0019] In an embodiment of the invention, the inner and/or the outer scannable code is a QR code.

[0020] In an embodiment of the invention, each specific inner scannable code is a unique code. That is, only one container is produced wherein the specific inner scannable code is used.

[0021] In an embodiment, each specific outer scannable code is a unique code. Alternatively, it

is also possible that the outer scannable code is a general, non-unique code, which is used on more than one produced container. If both the inner scannable and the outer scannable codes are unique, then the association between inner and outer scannable code will be one-to-one. That is, one specific inner scannable code will be associated with one specific outer scannable code. If the outer scannable code is not unique, then the outer-to-inner scannable code association will be one-to-many, respectively. That is, one specific outer scannable code is associated with a plurality of specific inner scannable codes.

Brief description of the drawings

[0022] The present invention will be discussed in more detail below, with reference to the attached drawings, in which:

Fig. 1 depicts an overview of a container according to an embodiment of the present invention in which the different parts constituting the container are separately visible.

Fig. 2 illustrates a container according to an embodiment of the present invention in a closed position.

Fig. 3 illustrates a container according to an embodiment of the present invention in a position where the cover is open.

Fig. 4 is a top view of the container according to an embodiment of the invention when the cover is open.

Fig. 5 is a container according to an embodiment of the present invention in a position where the cover is open.

Fig. 6 is a top view of a container according to an embodiment of the invention when the cover is open.

Description of embodiments

[0023] Fig. 1 depicts an overview of a container according to the present invention in which the different parts constituting the container are separately visible.

[0024] A container 1 according to the present invention comprises a container body 10 in which food, preferably infant formula food, is to be placed. The container further comprises a lid or cover 30 that is configured to close the container and protect the food content. The cover 30 may comprise a closure means 32 that allows the cover to be opened and closed so that the container can then be closed for a future use and the food can therefore be protected. The cover 30 may according to an embodiment of the invention further comprise a tamper-proof

closure means 34 (not shown in this figure) to further secure the closure means 32, so that the closure means , or cover 30 itself, can only be opened for the first time after breaking or altering the tamper-proof closure means 34. If a consumer who is to open the cover for the first time sees that the tamper-proof closure means 34 is not intact, it is a sign that the product might have already been opened and that it might not be authentic. The tamper-proof closure means 34 may be a plastic shrink sleeve wrapped around the cover 30, so that the opening part of the cover as well as the frame below it can both be covered, and optionally the container body 10, or one or multiple stickers covering the opening part of the cover 30 so that they leave evidence behind once they have been tampered with.

[0025] The container may further comprise a membrane seal 20, which is preferably a gas-tight membrane seal, located under the cover 30 and which covers the food containing space, sealing the product prior to use. The membrane seal 20 is preferably attached to the container by mechanisms that do not require glue, which is of preferable in a container suitable for infant formula food. The membrane seal 20 may be attached to the container using ultrasonic welding or induction sealing, or any other mechanism if gluing is not desired or that is appropriate for infant formula food containers. The membrane seal 20 may be made of a material that makes it suitable for protecting food content and that also allows it to be attached to the container. The membrane seal 20 may comprise a plastic, metal or plastics-metal foil.

[0026] In order to access the food inside the container, the membrane seal 20 needs to be opened. In an embodiment of the invention, the membrane seal 20 may have a tear strip 24 configured to be torn along a tear path 26 and to leave a part of the membrane seal 20 in the container. With this opening mechanism, a part of the membrane seal 20 is left in the container when the tear strip 24 is torn, and the membrane seal 20 is therefore not completely removed when opened, which has the advantage that once the membrane seal 20 has been opened it is extremely difficult to remove the rest and replace it with a new one without this being noticeable.

[0027] The tear strip 24 may comprise a pull tab 28 that allows a consumer to easily pull the tear strip 24 to open the membrane seal 20.

[0028] The container according to an embodiment of the present invention additionally comprises at least two scannable codes. In an embodiment of the invention, an outer scannable code 12 may be provided on the container so as to be scannable from the outside, so without opening the closure means 32 and without unfastening the tamper-proof closure means 34 (if present). This outer scannable code 12 may be placed on the outer part of the container body 10 or on the outer part of the cover 30, or on the outer surface of an outer box containing the container. The outer scannable code can be unique (e.g. used only on one container) or it can be used on a plurality of containers of the same type, or for a plurality of containers with the same content composition, the same batch number, the same expiration date, or other shared properties.

[0029] An inner scannable code 22 is furthermore provided on the membrane seal 20 so as to

be only scannable after opening the cover 30 through the closure means 32, and after breaking or altering the tamper-proof closure means 34 (if present). The inner scannable code 22 is therefore configured to be scanned only when the cover 30 has been opened. The inner scannable code may be unique (i.e. used only in one container).

[0030] The outer scannable code 12 and the inner scannable code 22 may be associated with each other. A more detailed explanation of the scannable codes will be explained in connection with the next figures.

[0031] Fig. 2 illustrates a container according to the present invention in a closed position. Fig. 2 therefore shows the container body 10 and the cover 30 with the closure means 32. The embodiment of fig. 2 furthermore comprises tamperproof closure means 34 which as an example has a form of a sleeve that is wrapped around the cover 30 and that does not allow the closure means 32 to be opened without the tamper-proof closure means 34 being broken or altered. Since the tamper-proof closure 34 cannot be put back intact once it has been altered, it allows a consumer to identify whether the product has been opened before purchasing it. In an alternative embodiment, the tamper-proof closure means is a sticker that goes over cover 30 and the underlying frame with which cover 30 connects and forms a closed system before the consumer opens the container for the first time.

[0032] When the product is in the store, a consumer may scan the outer scannable code 12 with a suitable code scanner, which can be implemented in a smartphone or tablet, or any other suitable device. The outer scannable code 12 may provide information about the product, and it therefore can be scanned before purchasing the product to obtain information such as the composition, the batch number, the expiration date, and other useful information.

[0033] The phrasing that the "outer scannable code is provided on the container" is also meant to include an outer box carrying the outer scannable code (12) which outer box contains the container (1) for infant formula food.

[0034] Fig. 3 illustrates a container according to the present invention in a position where the cover 30 is open. The inner scannable code 22 is preferably located in the membrane seal 20, more preferably on the outer part of the membrane seal 20 facing away from the food content.

[0035] In the embodiment of fig. 3 the inner scannable code 22 is placed on the outer part of the membrane seal 20. It can be seen that the inner scannable code 22 may only be scanned once the cover 30 has been opened, and therefore once the tamper-proof closure means 34, if present, has been irreversibly altered.

[0036] The inner scannable code 22, when scanned, may be used to obtain information, from e.g. a server connected to the Internet, indicating whether the code has already been scanned or not. The first time the inner scannable code 22 is scanned, the code scanner, which can be running in a smartphone, tablet, or other suitable reader, may send a message including the scanned inner scannable code to a server that stores information about the codes placed in

the different products, so that the server can record that the inner code has been scanned once. When the inner scannable code 22 is scanned a second time, and the code reader sends a message including the inner scannable code to the server, the server will recognize that the code has already been scanned before and will send a message back to the code reader with a warning. In this way, if a consumer scans the inner code and a warning is shown, he knows that the inner scannable code 22 has already been scanned once and that the product may therefore not be authentic.

[0037] If a counterfeiter would just make up an inner or outer scannable code, the server can reply, to the message including the inner or outer scannable code, that the scanned code does not exist and is therefore invalid.

[0038] If a counterfeiter would take two valid codes, one outer scannable code and one inner scannable code from different products and combine them (for example, combining the outer package, including outer scannable code, of a higher-cost product with the inner packaging and content, including the inner scannable code, of a lower-cost product) then, when the user scans the outer and inner scannable codes in succession, the server can indicate that the two scanned codes are not associated and that therefore the combined product is not authentic.

[0039] The inner scannable code 22 and the outer scannable code 12 may preferably be laser marked visible codes. This has the advantage that the marks left by laser marking cannot easily be changed since the laser beam removes the top layer. In another embodiment, the inner scannable code 22 and the outer scannable code 12 may be marked using inkjet. In this embodiment, a transparent finishing layer may cover the inkjet marking to protect it from being erased.

[0040] The inner scannable code 22 and the outer scannable code 12 may preferably be QR codes, but any other suitable code that is easy to read by a consumer device can also be used. The inner and outer scannable codes may codify a URL (Uniform Resource Locator) including a code value, so that the URL can be used by the scanning device to access a server via the Internet.

[0041] Fig. 4 is a top view of the container according to the invention when the cover is open. As it can be seen, the membrane seal 20 completely covers the space where the product is placed and it therefore seals it and protects it before use. The tear strip 24 can be torn so that the membrane seal 20 can be opened, leaving a part of the membrane seal 20 that is in contact with the container in place, and not removing it. The tear strip may comprise a pull tab 28 configured to be pulled by the consumer and to help the tear strip 24 to be torn.

[0042] The membrane seal 20 according to an embodiment of the invention may have a surface area of at least 50 square centimetres, or even at least 100 square centimetres.

[0043] The inner scannable code 22 according to the present invention is preferably placed on the membrane seal 20 outside the tear path, in order to avoid that the tear path may cause

imperfections in the code that make it not optimally scannable. In an exemplary embodiment, as shown in figure 4, the inner scannable code 22 is located on the part of the membrane seal which will be removed when the container is open, that is, on a side of the tear path opposite the side of a container's edge.

[0044] Fig. 5 is a container according to another embodiment of the present invention in a position where the cover is open, and fig. 6 is a top view of a container according to the invention when the cover is open.

[0045] The container represented in figures 5 and 6 has a different shape with respect to the embodiments of figures 1 to 4, but its components are to be interpreted as the same. The outer scannable code 12 may be placed on the outer surface of the container body 10, on the outer surface of the cover 30, or on the outer surface of an outer box containing the container, and the inner scannable code 22 may be placed on the membrane seal 20 so that it can only be scanned when the cover 30 is opened.

[0046] In the embodiment of fig. 5, the container may comprise tamper-proof closure means 34 also acting as closure means 32. In this embodiment, the first time the cover 30 is to be opened, the tamper-proof closure means 34 need to only partially be broken or torn, and from that moment, the tampering is evident and it is then configured to act as the closure means that allow the cover 30 to be closed and opened normally.

[0047] Fig. 6 shows that the shape of the container is different from the one in the first embodiment and therefore the size of the membrane seal 20 is also different, but it is always adapted to the shape of the container in order to seal and protect the product inside the container prior to use.

[0048] In an embodiment, the container according to the present invention has a container body 10 which is a circular metal can comprising an outer scannable code 12, a membrane seal 20, an inner scannable code 22, preferably positioned on the gas-tight membrane seal facing away from the infant formula content inside the container body, a pull-tab 28 to grab the membrane seal for easy removal thereof, a closure means 32 and preferably a tamper-proof closure means 34, most preferably in the form of a sticker that goes over cover 30 and the underlying frame with which cover 30 connects and forms a closed system before the consumer opens the container for the first time (all not shown). In this embodiment, the infant food container contains a peel-off seal which is a type of seal that is widely used in the infant formula industry that does not leave behind a part of the seal once it has been removed. In other words, such a seal type is fully removed from the container mouth which gives entry to the food contained in the container body 10. Such a gas-tight peel-off seal 20 does not leave a part of the membrane seal in the container.

[0049] The anti-counterfeit container of the present invention thus provides a layered authentication mechanism by which safety in the products is increased and a bigger hurdle for counterfeiters is posed. The outer and inner scannable codes 12 and 22 allow for a secure

authentication, but the specific places where these codes are located in the container make it more robust: the outer scannable code 12 may be scanned without the container being opened, but the inner scannable code 22, which is associated with the outer scannable code, can only be scanned when the cover 30 is opened and, if the container comprises tamper-proof closure means 34, when the tamper-proof closure means 34 is visibly and irreversibly broken or opened.

[0050] In the foregoing description of the figures, the invention has been described with reference to specific embodiments thereof. It will, however, be evident that various modifications and changes may be made thereto without departing from the scope of the invention as summarized in the attached claims.

[0051] In particular, combinations of specific features of various aspects of the invention may be made. An aspect of the invention may be further advantageously enhanced by adding a feature that was described in relation to another aspect of the invention.

[0052] It is to be understood that the invention is limited by the annexed claims and its technical equivalents only. In this document and in its claims, the verb "to comprise" and its conjugations are used in their non-limiting sense to mean that items following the word are included, without excluding items not specifically mentioned. In addition, reference to an element by the indefinite article "a" or "an" does not exclude the possibility that more than one of the element is present, unless the context clearly requires that there be one and only one of the elements. The indefinite article "a" or "an" thus usually means "at least one".

List of reference symbols

[0053]

1	Container
10	Container body
12	Outer scannable code
20	Membrane seal
22	Inner scannable code
24	Tear strip
26	Tear path
28	

30	Pull tab
32	Cover
34	Closure means
	Tamper-proof closure means

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- [WO2013125941A1 \[0006\]](#)
- [WO2016148587A1 \[0006\]](#)
- [US6446794B1 \[0006\]](#)

Patentkrav

1. Beholder (1) til modermælkserstatningsfødevarer, omfattende:
et låg (30) til lukning af beholderen;
5 og en gastæt membrantætning (20) inden i beholderen til forsegling af et fødevareindhold i beholderen før anvendelse; **kendetegnet ved, at** den endvidere omfatter:
en udvendig scanbar kode (12), der er tilvejebragt på beholderen, således at den er scanbar fra ydersiden;
10 og en indvendig scanbar kode (22), der er tilvejebragt på den gastætte membrantætning (20), således at den kun er scanbar efter åbning af beholderen (1).
2. Beholder (1) ifølge krav 1, hvor den gastætte membrantætning (20) omfatter
15 en afrivningsstrimmel (24), der er udformet til at blive afrevet langs en afrivningsbane og efterlade en del af membrantætningen i beholderen.
3. Beholder (1) ifølge et af kravene 1 eller 2, hvor den gastætte membrantætning (20) omfatter et plastik-, metal- eller plastik-metalfolie.
20
4. Beholder (1) ifølge et af de foregående krav, hvor låget (30) omfatter et manipulationssikret lukningsmiddel (34) til lukning af beholderen, som ikke kan åbnes uden permanent brud på en del af lukningsmidlet;
5. Beholder (1) ifølge et af de foregående krav, hvor den gastætte membrantætning (20) er fastgjort til beholderen med ultralydssvejsning.
25
6. Beholder (1) ifølge et af kravene 1 til 3, hvor den gastætte membrantætning (20) er fastgjort til beholderen med induktionsforsegling.
30
7. Beholder (1) ifølge et af de foregående krav, hvor den gastætte membrantætning (20) har et overfladeområde på mindst 50 kvadratcentimeter eller sågar mindst 100 kvadratcentimeter.

8. Beholder (1) ifølge et af de foregående krav, hvor den indvendige scanbare kode (22) er anbragt på ydersiden af membrantætningen (20), der vender væk fra beholderens indhold.

5 **9.** Beholder (1) ifølge et af kravene 2 til 8, hvor den indvendige scanbare kode (22) er placeret på den gastætte membrantætning (20) uden for afrivningsbanen.

10 **10.** Beholder (1) ifølge et af kravene 9, hvor den indvendige scanbare kode (22) er placeret på den gastætte membrantætning (20) på en side af afrivningsbanen modsat en beholderkant.

15 **11.** Beholder (1) ifølge et af de foregående krav, hvor den indvendige scanbare kode (22) er en lasermarkeret synlig kode på den gastætte membrantætning (20).

20 **12.** Beholder (1) ifølge et af de foregående krav, hvor den udvendige scanbare kode (12) er en lasermarkeret synlig kode på beholderens udvendige overflade.

13. Beholder (1) ifølge et af de foregående krav, hvor den indvendige scanbare kode (22) og udvendige scanbare kode (12) er associeret med hinanden.

25 **14.** Beholder (1) ifølge et af de foregående krav, hvor den indvendige scanbare kode (22) og/eller den udvendige scanbare kode (12) er en QR-kode.

15. Beholder (1) ifølge et af de foregående krav, hvor den udvendige scanbare kode (12) er scanbar uden at bryde en del af det manipulationssikrede lukningsmiddel.

DRAWINGS

Fig. 1

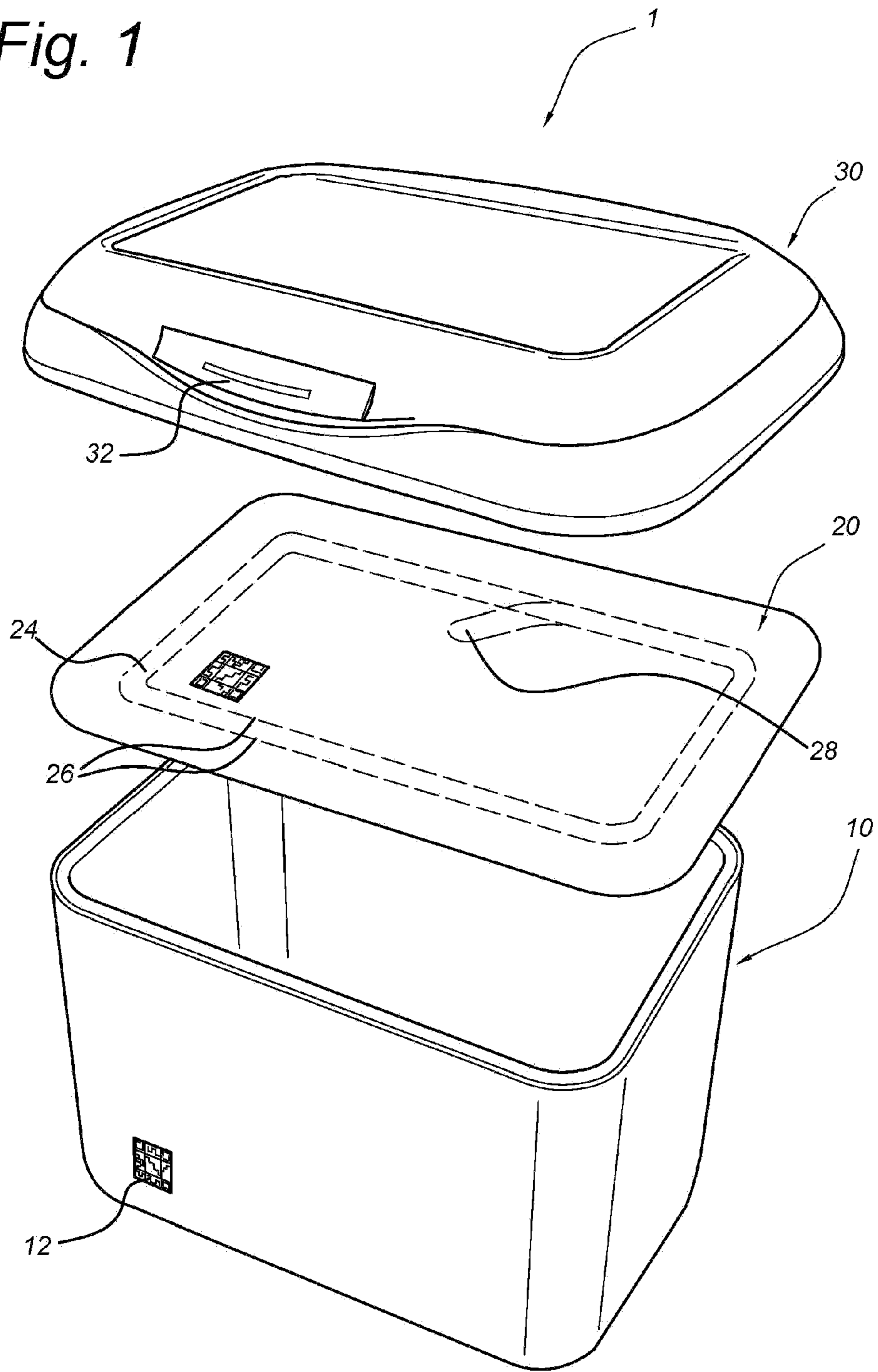


Fig. 2

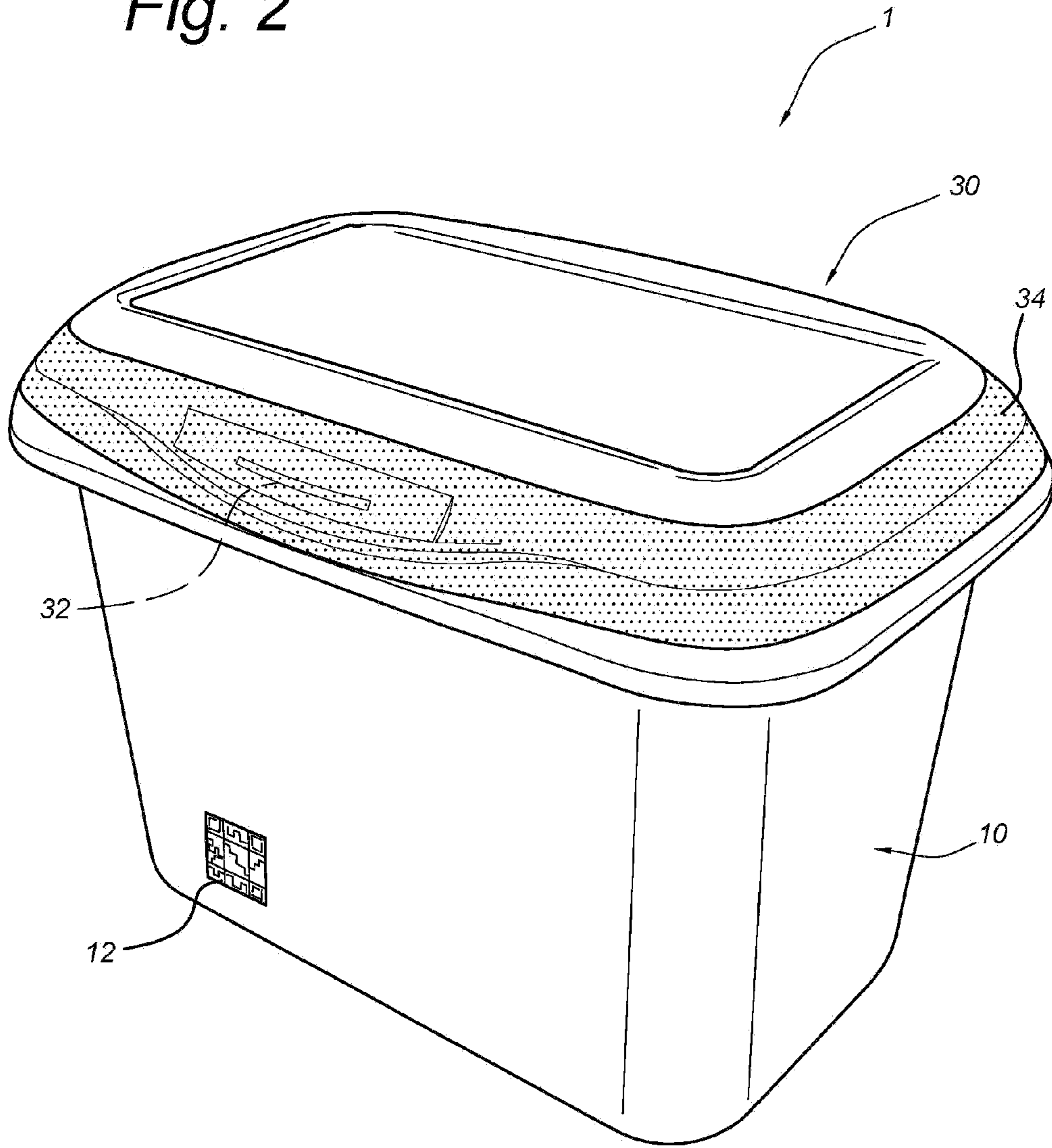


Fig. 3

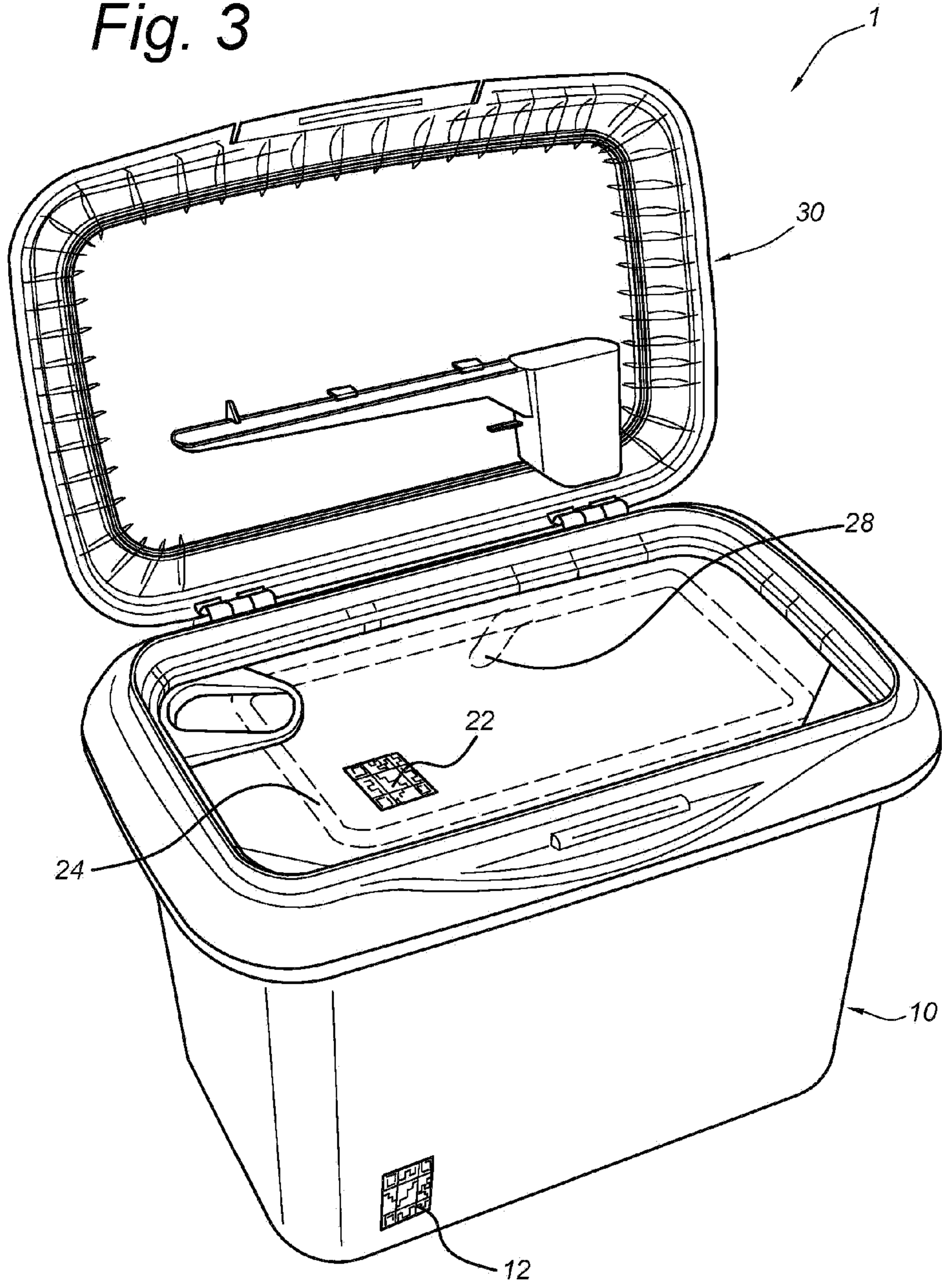


Fig. 4

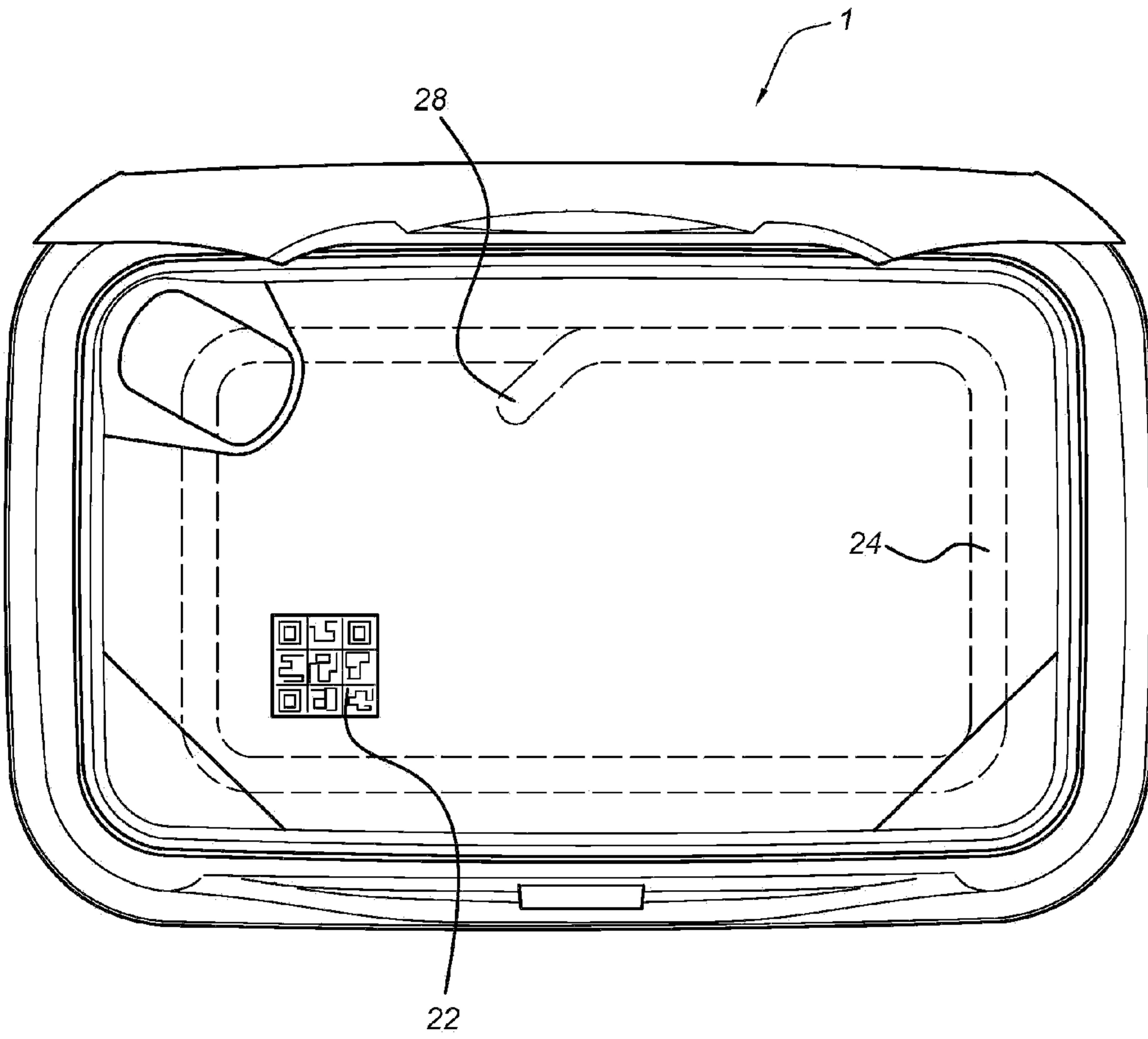


Fig. 5

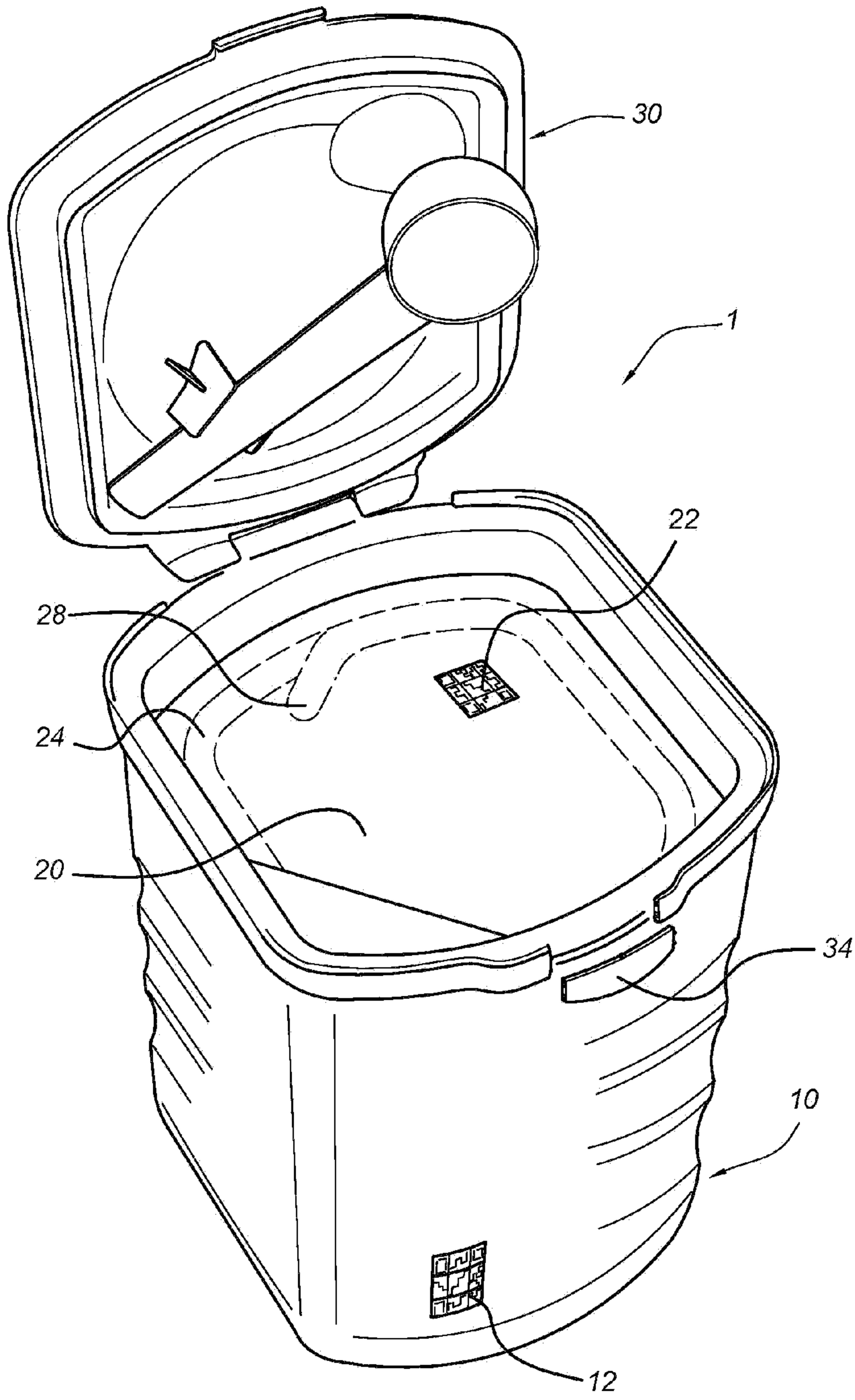


Fig. 6

