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(54) **PROCESS FOR APPLYING A PROTECTIVE DEVICE TO BEVERAGE RECIPIENTS**

VERFAHREN ZUM ANBRINGEN EINER SCHUTZVORRICHTUNG AN GETRÄNKEBEHÄLTER

PROCÉDÉ DE MISE EN PLACE D'UN DISPOSITIF DE PROTECTION SUR DES RÉCIPIENTS DE CONDITIONNEMENT DE BOISSONS

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(73) Proprietor: **CBE - Companhia Brasileira de Embalagens S/A**
CEP: 01451-000, São Paulo - SP (BR)

(72) Inventor: **PONTES, Jacques**
CEP:01425-010 - São Paulo - SP (BR)

(74) Representative: **Burt, Matthew Thomas et al**
Abel & Imray
20 Red Lion Street
London WC1R 4PQ (GB)

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EP 2 354 013 B1

Description

[0001] The present invention refers to an innovative process for applying a protective device to beverage recipients, notably metal cans used for bottling beer, sparkling drinks, energy drinks, juices, etc.

[0002] The present invention also refers to a beverage recipient, exactly like a metal can, having at least a protective device applied by the above process.

Description of the state of the art

[0003] Nowadays, consumers have at their disposal an unlimited number of beverages available for consumption in aluminum and tin cans, which are practical means of packaging, easy to open and, more importantly, effective and viable for recycling.

[0004] Recently, there has been a big increase in the variety of products available in cans. In times past, the offer was limited to soft drinks and beers, yet today it is possible to find energy drinks, assorted juices, teas, vodkas, wines, water, sports drink, etc. This increase in the quantity of products available in cans makes this kind of market altogether attractive, as it involves enormous sums of money.

[0005] Unfortunately, there is a notorious possibility of contamination of the upper portion of the cans, where the opening for consumption is located, due to the precarious hygiene in packaging and storage once the can has left the factory.

[0006] Owing to the geometric format of the upper portion, which is manufactured by stamping as a result inevitably generates ribs that act as channels, there is a large accumulation of dirt particles (which at times is difficult to remove), meaning the can must at least be washed under running water before the drink is opened for consumption.

[0007] Besides the particles of dirt *per se*, said format of the upper portion of the cans facilitates the accumulation of moisture and consequently the proliferation of pathogenic micro-organisms.

[0008] In extreme cases, these contaminating agents may be harmful to the health of the consumer who drank the liquid from the contaminated can, especially considering that the vast majority of consumers overlooks this risk and simply does not clean the can at all prior to consuming the drink.

[0009] As a solution to this drawback, a series of protective seals has been proposed, such as those disclosed in Brazilian patents BRMU 8301816-6, BRMU 8303346-7 and BRMU 8501669-1, in German patent DE 43 13 3752, in patent WO 01/15990, in Japanese patent JP 3-148492 and in North American patents US 6,073,797, US 5,452,818, US 5,139,163, US 6,443,323 and US 5,346,088.

[0010] The very applicant proposed an innovative and efficient seal which, besides having a protective effect, also bears a revolutionary thermochromic property, enabling the identification of the ideal temperature of the can for consuming the beverage. This innovative seal is the object of international patent PCT/BR2008/000102, the description of which is incorporated herein for prompt reference.

[0011] The main characteristic of the seal that is the object of patent application PCT/BR2008/000102 is that it is manufactured separately (or in isolation), in a prior stage to that of its installation on the can. It is obtained preferably by injection and has its own structure.

[0012] Various currently known seals are formed differently, because they begin life as plastic films, positioned over the can and heated, thereafter forced to mold over its upper portion. That is to say, these seals are shaped as they are applied to the cans.

[0013] Seals having their own structure have the advantage of bearing more elaborate formats, allowing, for example, characters to be printed carrying the name of the drink whose can it will protect, etc., and may have a different appearance and a controlled surface finishing, among other properties, while the seals shaped as they are applied to the can are esthetically less elaborate and are designed merely to act as protection, with no additional function.

[0014] However, despite the greater or lesser efficiency of each of the seals proposed above, it is a fact that its inclusion in the drink cans means further cost to be sustained by the beverage manufacturer and/or end consumer. This extra cost is a highly sensitive issue for the manufacturers, because on a worldwide basis the annual consumption of beverages bottled in metal cans reaches hundreds of millions of units, and even the slightest of hikes in the value of the product at the end of the year has a huge impact on corporate finances.

[0015] Moreover, due to the high competitiveness on the beverages market, consumers are very demanding in terms of price and will often opt not to pay extra simply because the can has a protective element, notably in more popular market sectors (cheaper drinks), precisely where sales indices are greatest. Hence, passing on a cost increase to the consumer resulting from the placement of a protective seal must be carefully analyzed, otherwise the product may lose market share.

[0016] Even though the use of protective seals is beneficial from a consumer's perspective, the market reality in many cases is that the purchaser is not willing to pay extra for it.

[0017] Therefore, it is crucial for drink manufacturers to reduce costs as far as possible relating to production and the placement of protective seals so as to ensure the feasibility of industrial scale manufacturing. This cost reduction is sought on the one hand by the conception of the seals themselves (by studying the geometry of the part, material used, etc.) and on the other hand by maximum streamlining of the productive process of applying these seals on the beverage cans.

[0018] As a rule, it is an industry consensus that, given the enormous quantities of beverages manufactured

every day, no delay in the application of seals will be tolerated in the bottling process of canned drinks because this would slacken productivity. It is therefore necessary to develop processes of applying the seals designed for the tremendous speed of the production lines, something which has not been successfully achieved to-date.

[0019] The first process for applying a protective seal in beverage cans is disclosed in North American patent US 6,336,309. In essence, the process comprises the initial positioning of a thermoformable film over a plurality of lined cans, positioned on a specific item of equipment. After the thermoformable film is positioned over the cans and heated, at the same time in which it is compressed to contact the upper portion of the can, being shaped, sealing the can and preventing contact with ambient air.

[0020] Hence, although this process is technically functional, it cannot be used to apply already structured seals such as those developed by the applicant and the object of the aforementioned international patent application PCT/BR2008/000102 (which is produced separately and applied to cans already in their definitive arrangement) since the seal, let it be repeated, is formed by heating a thermoformable film that molds over the upper portion of the cans only on the point of application.

[0021] Document JP 2152607 refers to a process of applying seals on beverage cans in which seals are formed by heating a thermoformable film into molds and, after shaping them, expulsed from the molds by applying jets of pressurized air, at the same time in which they are positioned over the upper portion of the cans. Next, the cans are positioned on a moving device (such as a belt) to a circular station where the seals are compressed on the cans to effect correct interlocking.

[0022] The process disclosed in document JP 2152607 differs from the process that is the object of the present invention in that the seal continues to be formed instants before its installation, though not over the cans, and is not applicable for positioning over the packaging of already structured seals.

[0023] Finally, document JP2045331 also discloses a process of applying a thermoformable seal for drink cans, wherein the seal is shaped when it is applied to the can.

[0024] Accordingly, thus far, there has not been developed a process for applying a protective device, notably a device having its own structure such as that disclosed in patent application PCT/BR2008/000102, individually, on each of the cans produced on a large assembly line of a drinks manufacturer, with total efficiency and reliability and without causing delays or production jams that lead to a reduction in corporate profits.

Objectives of the invention

[0025] The objective of the present invention is a process for applying a protective device to beverage recipients which enables the position of devices having their own structure on each bottled recipient, with speed and ultra high efficiency, without causing any delay to the production line of beverages, that is, without causing any decline in productivity of the line due to the application thereof.

[0026] The objective of the present invention is also a process for applying a protective device to beverage recipients that enables the positioning of devices on a bottled recipient, practically without increase in cost, allowing the drink to be competitively placed on the consumer market.

[0027] Finally, an objective of the present invention is also a recipient, particularly a beverage recipient in the form of a metal can, having at least a protective element applied by the process described above.

Brief description of the invention

[0028] The objectives of the present invention are achieved by a process for applying a protective device to beverage recipients that comprises the following steps:

step (i): conveyance of at least a protective device from a protective device feeder to a protective device applicator;
step (ii): positioning of the protective device on an upper portion of a beverage recipient; and
step (iii): fastening the protective device on the beverage recipient by applying pressure on the protective device in contact with the beverage recipient.

[0029] Additionally, the objectives of the present invention are achieved by a recipient, particularly a beverage recipient, which comprises a seal applied according to the process defined in the prior paragraph.

Brief description of the drawings

[0030] The present invention will now be described in greater detail based on an example of execution represented in the drawings. The drawings show:

Figure 1 - is a side view of a production line of bottled drinks in with the beverage recipient,
the step (iii) being preceded by a step of synchronizing which enables the positioning of each protective device in relation to the beverage recipient), by means of an accelerating device capable of positioning the protective devices (1) adjacently together before they enter a first star (116) which houses and conducts the recipients.

[0031] Additionally, the objectives of the present invention are achieved by a recipient, particularly a beverage recipient, which comprises a seal applied according to the process defined in the prior paragraph.

Brief description of the drawings

[0032] The present invention will now be described in greater detail based on an example of execution represented in the drawings. The drawings show:

Figure 1 - is a side view of a production line of bottled drinks in recipients (cans), in which the protective device is associated to each beverage recipient by means of a process, object of the present invention.
Figure 2 - is an overhead view of the production line illustrated in figure 1;
Figure 3 - is a side view of a protective device feeder used by the process that is the object of the present invention;
Figure 4 - is an overhead view of the protective device feeder illustrated in figure 3;
Figure 5 - is a perspective view of a protective device applicator used by the process that is the object of the present invention;
Figure 6 - is an overhead view of the illustrated in figure 5, showing a set of stars and a screw shaft;
Figure 7 - is a side view of the protective device applicator illustrated in figure 5, showing how the protective device is fastened onto the beverage recipient;
Figure 8 - is a perspective view of a fastening mechanism comprised by the protective device applicator illustrated in figure 5;
Figure 9 - is a perspective view of two units of beverage recipient having the protective device applied in accordance with the process of the present invention;

[0033] Preliminarily, it is important to note that, preferably, the protective device 1 is idealized for application to beverage recipients 7 in the form of beverage cans having diverse formats and drinks, such as cans of beers, soft drinks, energy drinks, sports drinks, juices, teas, vodkas and assorted spirits, among others, but obviously it can be applied to another other kind of recipient, if necessary or desirable.

[0034] As can be seen in figures 10, 11 and 12, the protective device 1 developed for use in a beverage recipient 7 comprises a first portion substantially circular 2 from which there projects a second portion being substantially ring-shaped 3. The first portion defines a first inner surface 2a, facing the upper portion of the beverage recipient 7 (where the frangible opening for consuming the drink is located) and a second opposite surface 2b, facing the outside, which can optionally carry advertising messages, information on the drink, drawings, pictures, etc.

[0035] Optionally, the first portion 2 comprises a circular channel 2c which allows the stacking of a portion of beverage recipients 7 protected by the protective device 1.

[0036] The second ring-shaped portion 3, in turn, defines a third inner surface 3a facing the side wall of the beverage recipient 7 and a fourth opposite surface 3b, facing the outside, which may optionally comprise gripping grooves and at least a tab 60 for removing the seal. To cooperate correctly with the beverage recipient 7, the projection 3 may be substantially cylindrical, tronconical or any other kind, provided it is functional.

[0037] The space defined by the first inner surface 2a of the first circular portion 2 and by the third inner surface 3a of the second ring-shaped portion 3 corresponds to a cavity.

[0038] Since the protective device 1 is preferably shaped by injected plastic, in fact the circular and cylindrical portions 2, 3 are parts of a single whole.

[0039] Preferably, there is provided at least an interlocking means to contact the protective device 1 onto the upper part of the beverage recipient 7. Preferably, said means is a ring-shaped projection that cooperates with a ring-shaped projection existing in the beverage recipient 7 (resulting from the re-embedding of the upper portion of the can on its side wall), correctly contacting the protective device 1 in place.

[0040] When the protective device 1 is correctly positioned, which is provided by the process of the present invention, the aforementioned cavity perfectly accommodates the upper portion of the beverage recipient 7, particularly because the second ring-shaped portion 3 acts as a sleeve, protecting the side of the can, adjacently to its upper portion (which is where the consumer places his mouth to drink), against the entrance of dirt and contaminants. Consequently, the chance of the consumer coming into contact with any contaminating agent is negligible.

[0041] In order to further guarantee the safety of the can and of the consumer, the protective device 1 additionally has a seal 6, comprised by at least a frangible line, which makes clear and visible any violation of the protective device 1 and, if applicable, opening of the can, situations in which the protection against dirt can no longer be guaranteed. In other words, breaking the seal 6 is an indication that the region of the cavity may have been exposed to dirt and contaminants and that the sealing against this kind of substance can no longer be guaranteed.

[0042] Although the possible protective device 1 has been described, it is important to note that the scope of protection of the invention is not focused on its characteristics, but rather on the essentially innovative aspects of the process for applying this device to a recipient, such as the aforementioned metal beverage can.

[0043] In other words, any protective device may be applied to a can (such as, for example, the object of the patent application PCT/BR2008/000102 filed by the applicant itself, or any other) without the resulting invention straying from the scope of protection of the appended claims.

[0044] Nevertheless, preferably the protective device has its own structure, that is, it is manufactured sepa-

rately (or in isolation), in a stage prior to its installation in the recipient. Even more preferably, the protective device 1 is manufactured by injection.

[0045] The process for applying a protective device 1 on the beverage recipients 7, object of the present invention, has as its first essential characteristic is to cause minimum impact on the conventional beverage production line, which in itself reduces the implantation cost.

[0046] For the process to be operational, a protective device feeder 100 should be used, illustrated in figures 1 to 4, capable of feeding the protective devices 1 on the production line, so that subsequently they can be fastened over the beverage recipient 7, which, in turn, travels normally along the recipient conveyor belt 101, after bottling the beverage and re-embedding of its upper portion (or "lid").

[0047] In essence, the process for applying a protective device 1 to beverage recipients 7 comprises the following steps:

step (i): conveyance of at least a protective device from a protective device feeder to a protective device applicator;
step (ii): positioning of the protective device 1 over an upper portion of a beverage recipient 7; and
step (iii): fastening the protective device 1 on the beverage recipient 7 by applying pressure to the protective device 1 to contact the recipient.

[0048] Before positioning the protective devices 1 over the beverage recipients 7, they preferably receive a sterilizing or sanitizing treatment, with a view to annihilating any pathogenic agents. Preferably, the protective devices 1 are submitted to the application of air at high temperatures, which is a highly efficient means and currently used by the food products industry for sterilization. Optionally, the protective devices 1 may receive the application of gamma (y) rays and/or EtO (ethylene oxide) gases. However, obviously other means can be used for sterilizing the protective devices 1, without the resulting invention straying from the scope of protection of the claims.

[0049] The upper portion of the beverage recipient 7 is preferably kept free of moisture, so as to avoid the proliferation of fungus, bacteria and mites after fastening the protective device 1 on the beverage recipient 7. The present invention provides a solution for completely drying the upper portion of the beverage recipient 7 by applying a certain amount of heat sufficient to provide the evaporation of all moisture which may be present in said upper portion of the beverage recipient 7. Preferably, the heat is provided by means of a hothouse 102 positioned on the recipient conveyor belt 101 itself, as can be seen in figures 1 and 2. This hothouse 102 can also be used in the sterilization and sanitization step of the beverage recipient 7 described above. Alternatively, there can also be provided an air flow by way of a ventilator to dry the upper portion of the beverage recipient 7.

[0050] As can be seen in the drawings, a recipient conveyor belt 101 is associated to at least a screw shaft 103, such that each beverage recipient 7 is accommodated between two consecutive threaded screws to be conveyed by the rotational movement of the screw shaft 103.

[0051] The screw shaft 103 is associated to a protective device applicator 104, so as to enable the conveyance of the beverage recipient 7 from the recipient conveyor belt 101 to said protective device applicator 104.

[0052] Concomitantly to the conveyance of the beverage recipient 7 by the recipient conveyor belt 101 and by the screw shaft 103, there is also the conveyance of at least a protective device 1 from the protective device feeder 100 to the protective device applicator 104 by means of a protective device conveyor 105 which, preferably, consists of a mechanism of drives and/or belt. Naturally, other devices, mechanisms and suitable means of conveyance could be used.

[0053] It must be noted that to guarantee that the fastening of the protective device 1 on the beverage recipient 7 is performed correctly, the protective device 1 should be positioned with its second portion being substantially ring-shaped 3 facing the upper portion of the beverage recipient 7. The present invention is capable of guaranteeing said correct positioning automatically by way of a correction drum 112 which is preferably comprised by the protective device feeder 100, as can be seen in figures 3 and 4.

[0054] Further according to figures 3 and 4, the protective device feeder 100 is provided with an upwards conveyor belt 107 capable of conveying the protective devices 1 to the correction drum 112, which, in turn, is associated to the protective device conveyor 105. This upwards conveyor belt 107 has a substantially open and inverted "C" format (mirrored) and is provided with a base portion 108, an upwards portion 109 and a delivery portion 110 jointly associated. The conveyance of the protective devices 1 on the upwards conveyor belt 107 is as follows: firstly, the base portion 108 receives the protective devices 1 and conducts them to the upwards portion 109, which in turn, conducts the protective devices 1 vertically towards the delivery portion 110, where the protective devices 1 are transferred to the correction drum 112 by gravity force.

[0055] The correction drum 112, capable of angularly moving in a rotational fashion around its geometric axis, comprises a plurality of flaps (not illustrated), disposed at angles in relation to the inner wall of the drum, arranged to receive the protective devices 1 coming from the upwards conveyor belt 107. If the protective device 1 is already positioned correctly in the flaps of the correction drum 112 (there is cooperation between the protective device 1 and the flaps), it is conveyed to an upper position in the correction drum 112 (see figures 3 and 4) so that it can be transferred to the protective device conveyor 105. On the other hand, if the protective device 1 is not accommodated in the flaps of the correction drum 112 correctly (there is no cooperation between the protective

device 1 and the flaps), it is not transferred to the protective device conveyor 105, and remains in the correction drum 112 until its position is corrected by the rotational angular movement of the correction drum 112. More specifically, when the protective device 1 reaches a highest maximum point in the correction drum 112 it falls into other flaps of the correction drum 112 (lowest minimum point) by gravity force, disposed diametrically opposite the flaps in which the protective device 1 was previously accommodated, as there is no cooperation between the protective device 1 and the flaps. In this last step, the positioning of the protective device 1 is corrected.

[0056] In any case, whatever the particular constitution of the protective device feeder 100, it is arranged so as to correct the position of the protective device 1 automatically.

[0057] As can be seen in figures 5 to 7, the protective device applicator 104 comprises a mechanism of three stars 115, namely, a first star 116, a second star 117 and a third star 118, capable of angularly moving in rotational fashion around its respective central geometric axes. Each star is provided with at least an accommodation capable of receiving at least a beverage recipient 7. Preferably, each star 116, 117, 118 has a plurality of accommodations to allow the simultaneous housing of a plurality of beverage recipients 7, providing great speed and rapidity to the process (process streamlining). Naturally, the protective device feeder 100 and the protective device conveyor 105 are arranged to provide a discharge of protective devices 1 compatible with the configuration and rotational speed of the three stars 116, 117, 118. The three stars 116, 117, 118 are both disposed adjacently and tangentially two by two (in pairs), so that the transfer of the protective devices 1 between the adjacent stars occurs precisely at their tangent points. It is important to note that the stars disposed adjacently together rotate in opposite directions.

[0058] As can be seen in the drawings, the first star 116 is associated to at least a screw shaft mechanism 103, already mentioned. In the first star 116, there occurs the indexation and synchronization of the protective devices 1 coming from the protective device feeder 100 in relation to the quantity of beverage recipients 7 coming from the recipient conveyor belt 101. Said synchronization, which occurs while the first star 116 moves angularly, is provided by means of an accelerating device capable of positioning the protective devices 1 adjacently together before they enter the first star 116. Accordingly, the first star 116 is capable of guaranteeing the perfect indexation or synchronicity, between the supply of protective devices 1 and the discharge of beverage recipients 7 which are conducted to the second star 117.

[0059] The second star 117 receives the protective device 1 of the first star 116 by means of a vacuum force or any other suitable means, to guarantee that it is correctly positioned over an upper portion of a beverage recipient 7. This positioning is only possible by the synchronicity provided by the first star 116. In other words, the first star 116 enables highly precise positioning of the protective device 1 over the surface portion of each beverage recipient 7 in the second star 117.

[0060] After the positioning of the protective device 1 on the beverage recipient 7, a fastening item of equipment 113, associated over a second star 117, exerts a pre-set pressure for it to be correctly fastened. As mentioned previously, preferably, fastening the protective device 1 over the beverage recipient 7 is by the cooperation of the already mentioned ring-shaped projection provided in the protective device 1 with a ring-shaped projection existing on the upper portion of the beverage recipient 7 (and resulting from the re-embedding of the upper portion of the can on its side wall). Said cooperation completely engages the seal on the can, such that the protective device 1 cannot be withdrawn from the can without violation (breaking of the seal 6).

[0061] As can be seen in figure 8, preferably, the fastening equipment 113 is provided with at least a plurality of re-embedding heads 114 capable of exerting a pressure of, for example, 1 atmosphere (atm) on the protective device 1 to contact the beverage recipient 7. Said pressure, which may naturally vary according to the type of protective device 1, can (beverage recipient 7) and equipment involved, fastens the protective device 1 definitively. More specifically, the fastening equipment 113 comprises upper inner rails, along which the re-embedding heads 114 move according to the angular rotational movement of the second star 117. Re-embedding occurs when the re-embedding head 114 passes through a cam, associated to the rail, capable of permitting an axial movement of the re-embedding head 114 downwards, so to exert a pressure on the protective device 1 and the beverage recipient 7.

[0062] By the angular rotational movement of the third star 118, associated to the second star, the beverage recipient already bearing the protective device 1 is conducted to a photoelectric cell, fiber optics or the like, for checking, and forwarded to the so-called shipment packing lung, for packing into cardboard boxes and/or application of plastic film.

[0063] Lastly, it is important to note that it is possible to have more than one protective device feeder 100 and more than one protective device applicator 104 for a single production line, as can be seen in figure 2.

[0064] A further invention that is new and inventive, included in the scope of protection of the appended claims, is a beverage recipient 7, which comprises the protective device 1 now described.

[0065] Having described examples of preferred embodiments, it should be understood that the scope of the present invention encompasses other possible variations, and is only limited by the content of the claims appended hereto, other potential equivalents being included therein.

Claims

1. Process for applying protective devices (1) to beverage recipients (7), comprising the following steps:

   step (i): conveyance of each protective device (1) from a protective device feeder (100) to a protective device applicator (104);
   step (ii): positioning of each protective device (1) over an upper portion of one corresponding beverage recipient (7); and
   step (iii): fastening each protective device (1) on the corresponding beverage recipient (7) by applying pressure to the protective device (1) to contact the beverage recipient (7), wherein

   the step (iii) is preceded by a step of synchronizing, which enables the positioning of each protective device (1) in relation to the corresponding beverage recipient (7), by means of an accelerating device capable of positioning the protective devices (1) adjacently together before they enter a first star (116) which houses and conducts the recipients.

2. Process according to claim 1, **characterized in that** the step (i) is preceded by a step of applying a certain amount of heat capable of evaporating the moisture present in said upper portion of the beverage recipient 7.

3. Process according to claim 1 or 2, **characterized in that** the step (i) is preceded by a sterilizing or sanitizing treatment step of the protective device (1).

4. Process according to claim 3, **characterized in that** the sterilization process comprises the application of air at high temperatures to the protective device (1).

5. Process according to any of the prior claims, **characterized in that** simultaneously to step (i) there is a conveyance step of at least a beverage recipient (7) to the protective device applicator (104).

6. Process according to any of the prior claims, **characterized in that** the step (i) is preceded by a step of automatically correcting the position of the protective device (1), if the protective device (1) is not correctly positioned.

7. Process according to any of the prior claims, **characterized in that** after step (iii), a checking step is performed whereby the recipient containing the device (1) passes by a photoelectric cell, fiber optics or the like.

8. Process according to any one of claims 1 to 7, **characterized by** the beverage recipient being a metal can.

Patentansprüche

1. Verfahren zum Anbringen von Schutzeinrichtungen (1) an Getränkebehältern (7), wobei das Verfahren folgende Schritte aufweist:

   Schritt (i): Zuführen der jeweiligen Schutzreinrichtung (1) von einer Schutzeinrichtungs-Zuführungsvorrichtung (100) zu einem Schutzeinrichtungs-Applikator (104);
   Schritt (ii): Positionieren der jeweiligen Schutzeinrichtung (1) über einem oberen Bereich von einem entsprechenden Getränkebehälter (7); und
   Schritt (iii): Befestigen der jeweiligen Schutzeinrichtung (1) an dem entsprechenden Getränkebehälter (7) durch Aufbringen von Druck auf die Schutzeinrichtung (1), damit diese mit dem Getränkebehälter (7) in Kontakt kommt,

   wobei dem Schritt (iii) ein Synchronisierungsschritt vorausgeht, der die Positionierung der jeweiligen Schutzeinrichtung (1) in Relation zu dem entsprechenden Getränkebehälter (7) ermöglicht, und zwar mittels einer Beschleunigungseinrichtung, die in der Lage ist, die Schutzeinrichtungen (1) in anliegender Weise zusammen zu positionieren, bevor sie in einen ersten Stern (116) eintreten, der die Behälter aufnimmt und führt.

2. Verfahren nach Anspruch 1,
   dadurch gekennzeichnet,
   dass dem Schritt (i) ein Schritt vorausgeht, in welchem eine bestimmte Wärmemenge aufgebracht wird, die in der Lage ist, die Feuchtigkeit zu verdampfen, die in dem oberen Bereich des Getränkebehälters (7) vorhanden ist.

3. Verfahren nach Anspruch 1 oder 2,
   dadurch gekennzeichnet,
   dass dem Schritt (i) ein Sterilisierungs- oder Reinigungsbehandlungsschritt der Schutzeinrichtung (1) vorausgeht.

4. Verfahren nach Anspruch 3,
   dadurch gekennzeichnet,
   dass der Sterilisierungsvorgang das Aufbringen von Luft bei hohen Temperaturen auf die Schutzeinrichtung (1) umfasst.

5. Verfahren nach einem der vorhergehenden Ansprüche,
   dadurch gekennzeichnet,
   dass gleichzeitig mit dem Schritt (i) ein Förderschritt von mindestens einem Getränkebehälter (7) zu dem

Schutzeinrichtungs-Applikator (104) stattfindet.

6. Verfahren nach einem der vorhergehenden Ansprüche,
dadurch gekennzeichnet,
dass dem Schritt (i) ein Schritt vorausgeht, bei dem die Position der Schutzeinrichtung (1) automatisch korrigiert wird, wenn die Schutzeinrichtung (1) nicht korrekt positioniert ist.

7. Verfahren nach einem der vorhergehenden Ansprüche,
dadurch gekennzeichnet,
dass nach dem Schritt (iii) ein Prüfschritt durchgeführt wird, in welchem der Behälter, der die Schutzeinrichtung (1) aufweist, an einer photoelektrischen Zelle, einer Faseroptik oder dergleichen vorbeiläuft.

8. Verfahren nach einem der Ansprüche 1 bis 7,
dadurch gekennzeichnet,
dass der Getränkebehälter eine Metalldose ist.

Revendications

1. Procédé pour appliquer des dispositifs protecteurs (1) à des récipients de boisson (7), comprenant les étapes suivantes :

étape (i) : transport de chaque dispositif protecteur (1) d'un dispositif d'alimentation de dispositif protecteur (100) à un applicateur de dispositif protecteur (104) ;
étape (ii) : positionnement de chaque dispositif protecteur (1) au-dessus d'une partie supérieure d'un récipient de boisson (7) correspondant ; et
étape (iii) : fixation de chaque dispositif protecteur (1) sur le récipient de boisson (7) correspondant en appliquant une pression au dispositif protecteur (1) pour venir en contact avec le récipient de boisson (7),

dans lequel l'étape (iii) est précédée d'une étape de synchronisation, qui permet le positionnement de chaque dispositif protecteur (1) par rapport au récipient de boisson (7) correspondant, au moyen d'un dispositif d'accélération capable de positionner les dispositifs protecteurs (1) au voisinage les uns des autres avant qu'ils pénètrent dans une première étoile (116) qui reçoit et conduit les récipients.

2. Procédé selon la revendication 1, **caractérisé en ce que** l'étape (i) est précédée d'une étape d'application d'une certaine quantité de chaleur capable de faire évaporer l'humidité présente dans ladite partie supérieure du récipient de boisson (7).

3. Procédé selon la revendication 1 ou 2, **caractérisé en ce que** l'étape (i) est précédée d'une étape de traitement de stérilisation ou d'assainissement du dispositif protecteur (1).

4. Procédé selon la revendication 3, **caractérisé en ce que** le procédé de stérilisation comprend l'application d'air au dispositif protecteur (1), à des températures élevées.

5. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** simultanément à l'étape (i), il existe une étape de transport d'au moins un récipient de boisson (7) jusqu'à l'applicateur de dispositif protecteur (104).

6. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'étape (i) est précédée d'une étape de correction automatique de la position du dispositif protecteur (1), si le dispositif protecteur (1) n'est pas correctement positionné.

7. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**après l'étape (iii), une étape de vérification est réalisée, en sorte que le récipient contenant le dispositif (1) passe par une cellule photoélectrique, une fibre optique ou analogue.

8. Procédé selon l'une quelconque des revendications 1 à 7, **caractérisé en ce que** le récipient de boisson peut être une canette en métal.

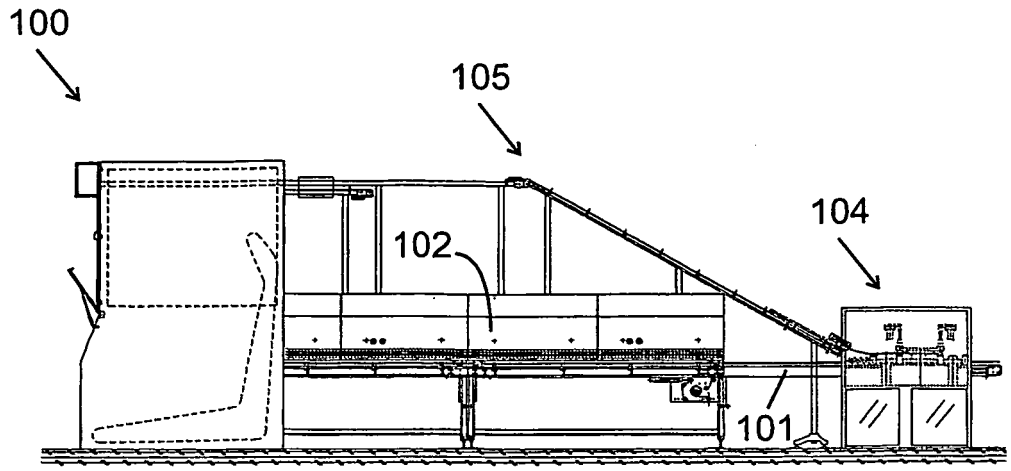

100
105
104
102
101

Fig. 1

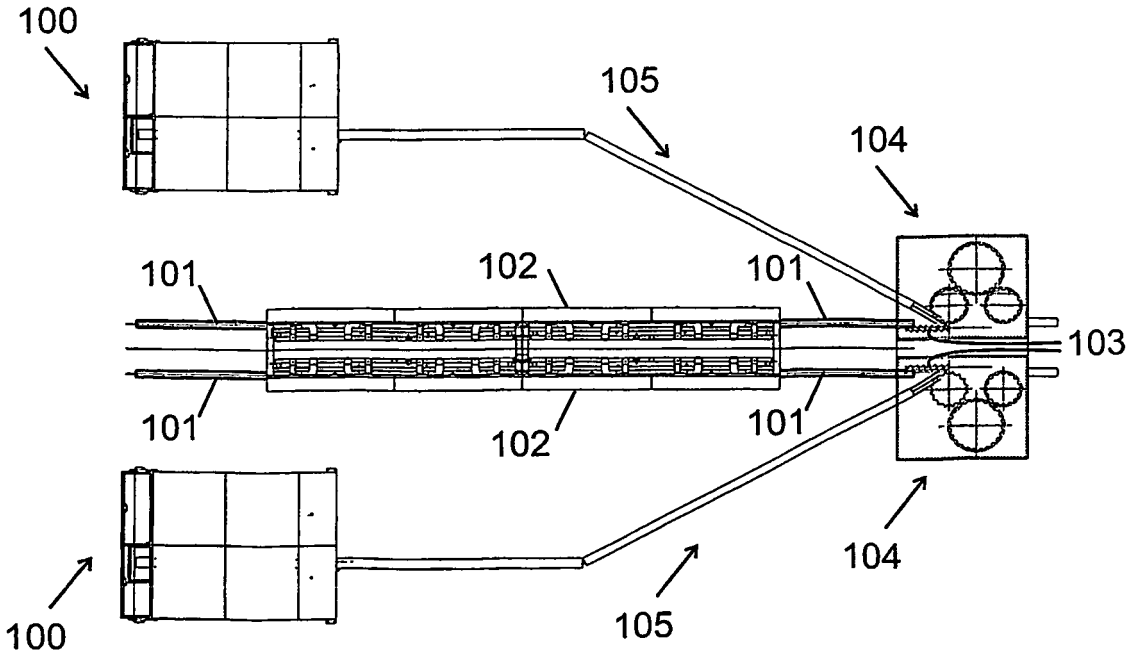

100
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Fig. 2

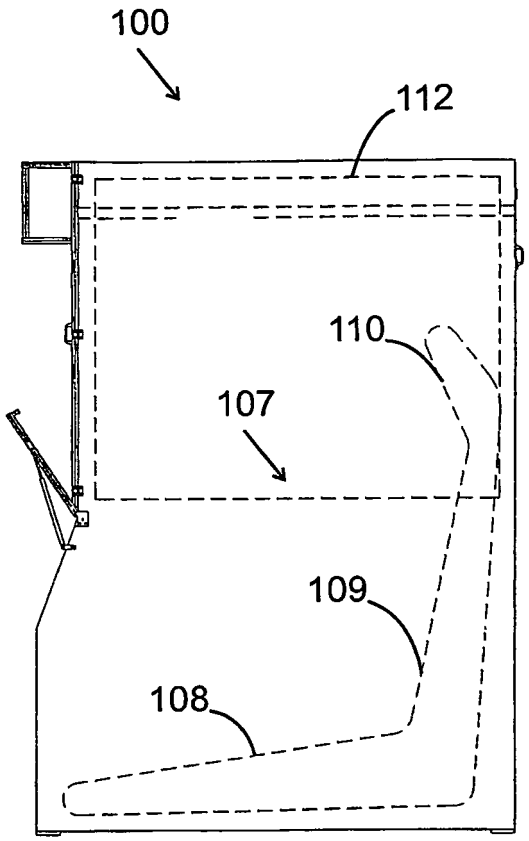


Fig. 3

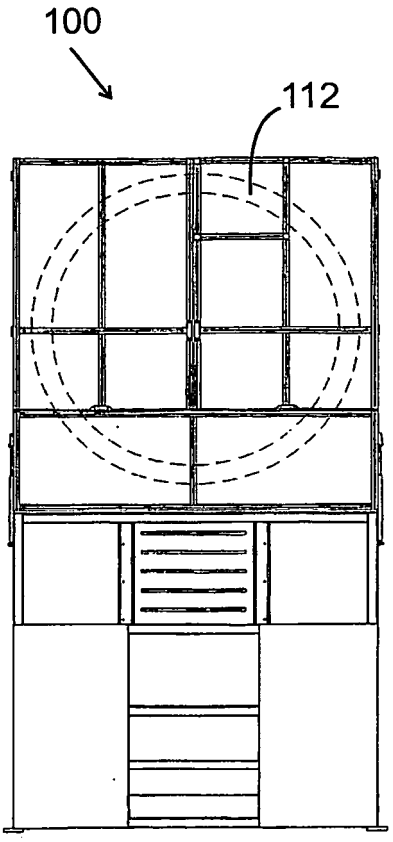


Fig. 4

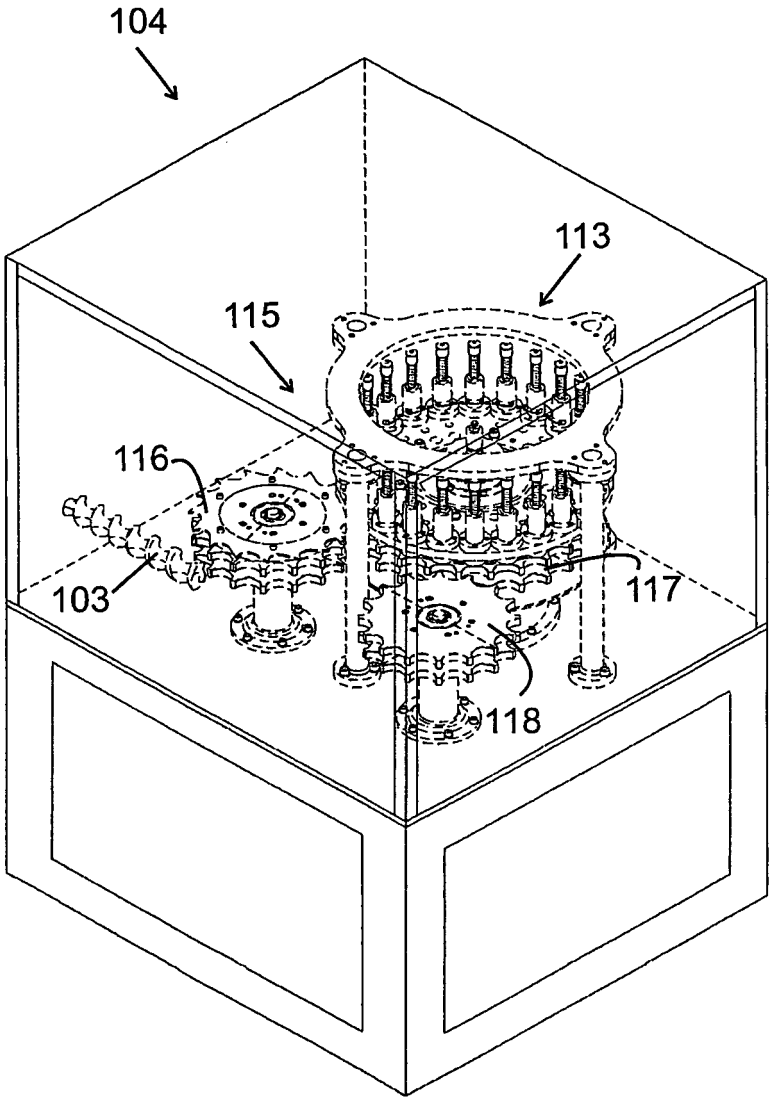


Fig. 5

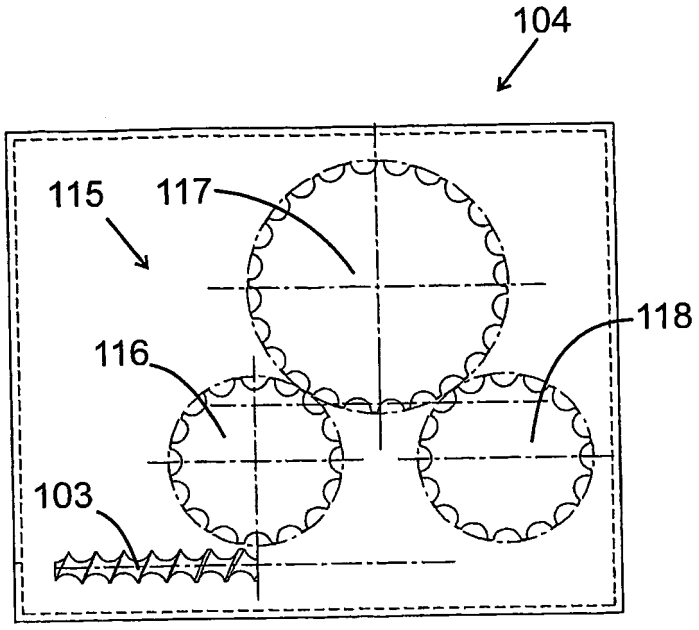


Fig. 6

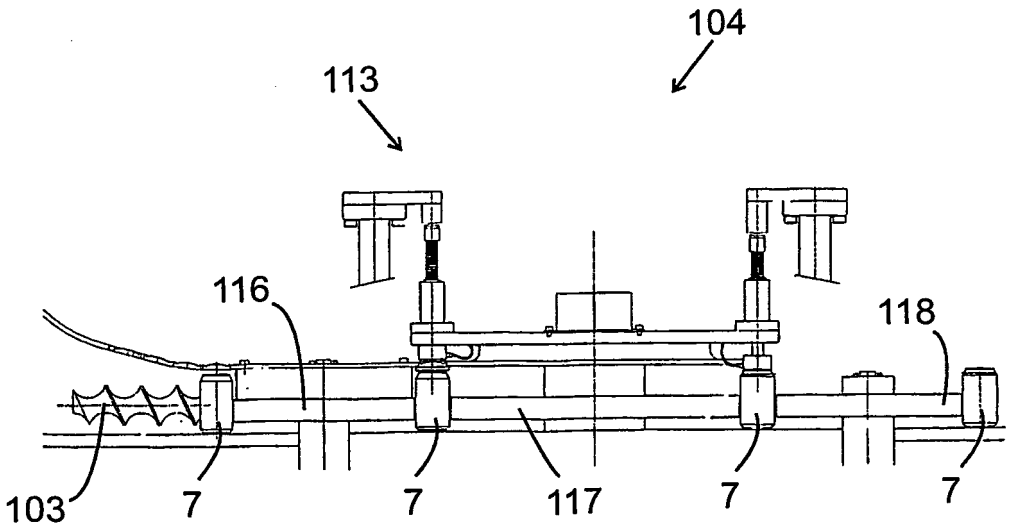


Fig. 7

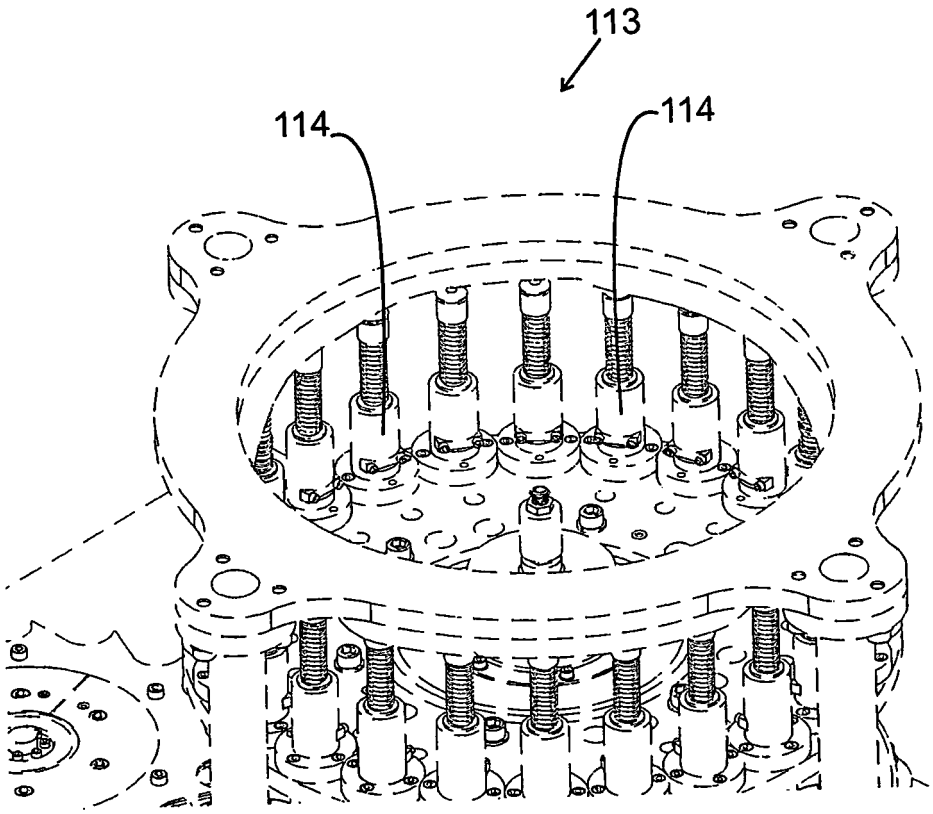


Fig. 8

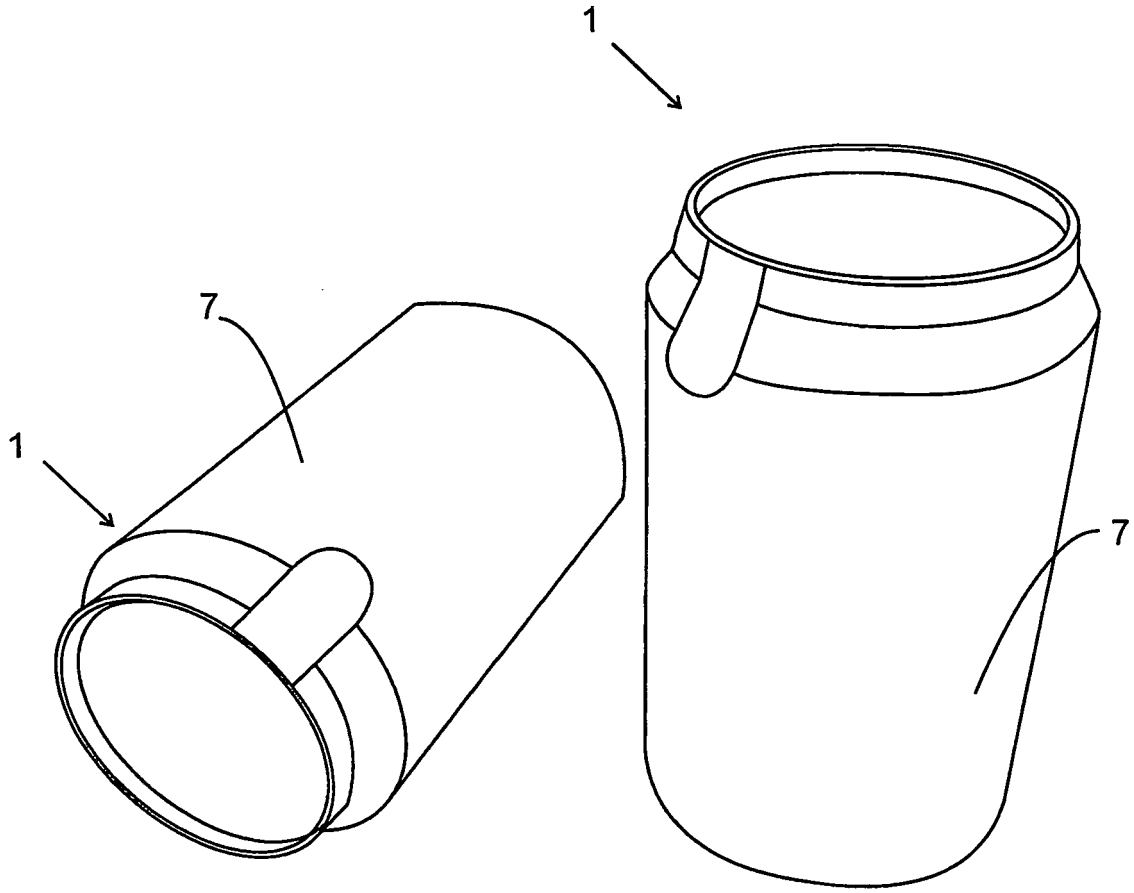


Fig. 9

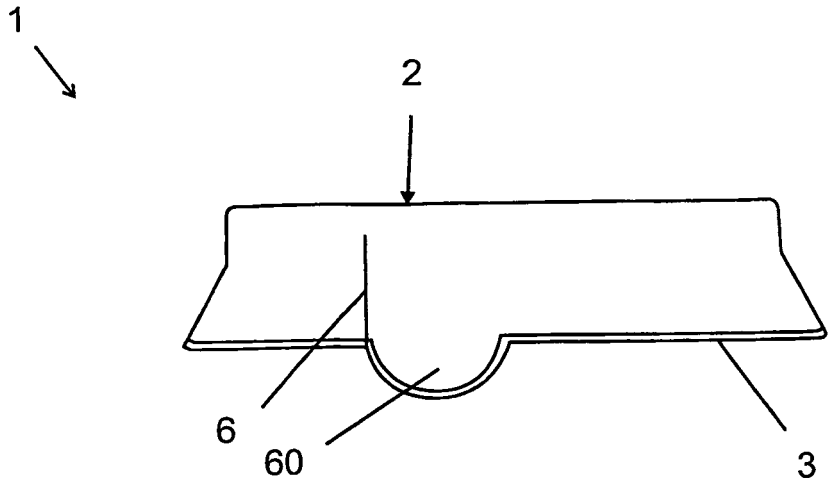


Fig. 10

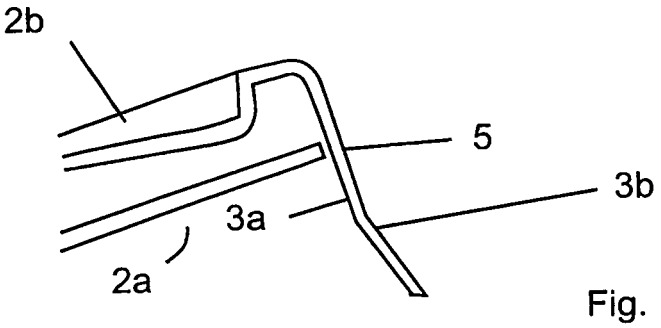


Fig. 11

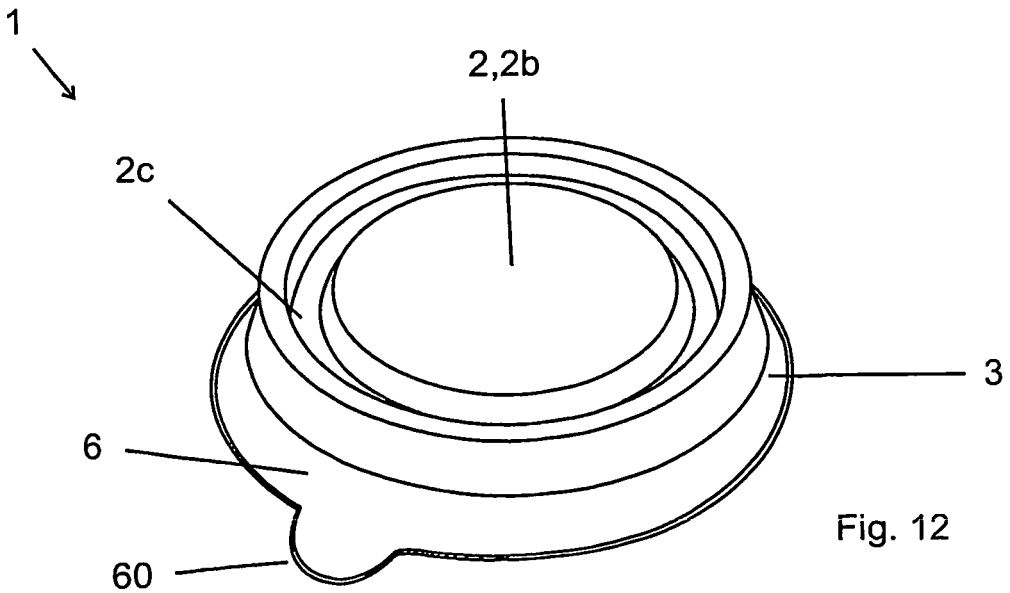


Fig. 12

REFERENCES CITED IN THE DESCRIPTION

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