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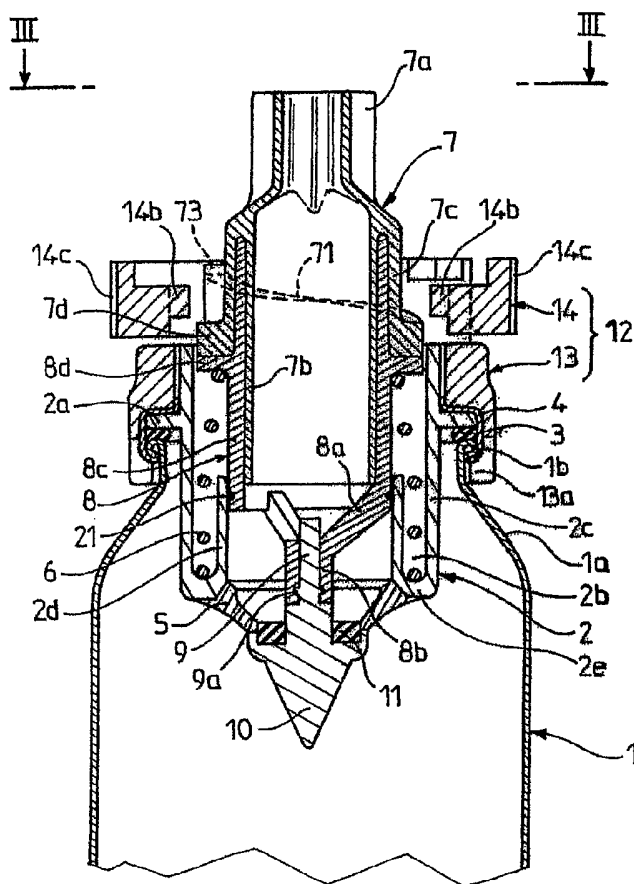
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(54) Title: PRESSURIZED RECEPTACLE FOR DISPENSING A VISCOUS PRODUCT



(57) Abstract: Pressurized receptacle for dispensing a viscous product comprising a container (1) equipped with a dispensing valve; the valve has a valve pot (2) and a valve element (10) secured to a translatable dispensing stack subjected to the action of a spring (6); the valve element cooperates with a seat (5) borne by the valve pot in order to close the valve under the action of the spring; the spring is compressed in order to open the valve by an operating means acting on the dispensing stack; the product to be dispensed is ejected from the receptacle through the valve and the dispensing stack. The dispensing stack bears on the side directed away from the valve at least one helical ramp (71, 72) of the same axis as the valve; the operating means is a rotary collar (12) fixed in translation with respect to the container, the said collar having at least one stud (14b) which can cooperate with the helical ramp or ramps in order to cause a translational movement of the dispensing stack when the collar is rotated.



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### **Pressurized receptacle for dispensing a viscous product**

The present invention relates to a pressurized receptacle for dispensing viscous products, this receptacle having a dispensing valve which, for the  
5 discharge of the product, provides the discharging flow with a large cross section.

The specific problem regarding the dispensing of a high-viscosity product, such as an ice-cream for example, arises from the fact that it is vital for the  
10 dispensing valve of the receptacle to provide, on opening, a passage cross section which is sufficient to minimize the pressure drops in the flow of the product. This is because, if the pressure drop in the discharging flow of the product is too large, the product throughput is insufficient, serving only to increase the pressure prevailing inside the receptacle containing the product.  
15 Now, such a pressure increase is incompatible with the safety regulations which must be complied with, especially with regard to the packaging of food products. The problem relating to this type of dispensing operation is perfectly explained in the PCT Patent Application published under No. WO 03/068632.

20 In Patent Application WO 03/068632 mentioned above, a pressurized receptacle for dispensing a viscous product is described, the said receptacle comprising a container equipped with a dispensing valve, the said valve having a valve pot fastened on the container by crimping and a valve  
25 element which is secured to a dispensing stack which can be moved translationally in a sealed manner with respect to the valve pot; the valve element is subjected to the action of a spring and cooperates with a seat borne by the valve pot in order to close the valve under the action of the spring; to open the valve, it is possible to compress the spring by a lever  
30 whose point of articulation is integral with the valve pot and whose point of action is integral with the dispensing stack. In such a valve, on opening of the valve the product to be dispensed is ejected from the receptacle by passing between the valve element and its seat and then through the dispensing stack. It is possible without difficulty to increase the diameter of  
35 the dispensing stack in order, on the one hand, to reduce the pressure drops during the passage of the product and, on the other hand, to increase the throughput of the dispensed product. The result of this is that the only location where a significant pressure drop occurs is the passage between the valve element and its seat; when opened by compression of the spring, the

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valve element may be sufficiently removed from its seat and consequently the pressure drop at this location is dependent only on the diameter of the valve-element seat, which is limited only by the size of the crimping bead which provides fastening of the valve.

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This type of valve is satisfactory from the point of view of product flow but has a major disadvantage as far as handling of the valve by the user is concerned. This is because, for opening purposes, the user must use one hand to move the lever by applying a force parallel to the axis of the receptacle and use his other hand to keep hold of the receptacle, this action not being appreciated by the users. Moreover, so that the lever can be operated even by children, it is necessary to provide the lever with a minimum length, which is disadvantageous because the lever then projects beyond the side of the receptacle, this projection being inconvenient for storing the receptacle and being unattractive as well. This observation is all the more pertinent because the force exerted by the spring to close the valve is necessarily high to allow closure to take place very quickly if the user releases his action on the lever, this measure being required to ensure the safety of the dispensing operation.

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In order to solve the problem set out hereinabove, the aim of the present invention is to propose a receptacle comprising a dispensing valve of the same type as described above; the solution to the problem set is provided by the fact that the operation of the said valve is carried out by means of a rotary actuator, which overcomes the disadvantage of the projecting lever of the prior-art system cited hereinabove while retaining the advantages relating to the low level of pressure drops during dispensing. Furthermore, the operation of the actuator of the receptacle according to the invention is appreciated by the users in terms of handling and requires only little effort to initiate opening because of the reduction mechanism that is provided by the use of a system of helical ramps. Finally, the receptacle proposed by the invention allows the dispensing operation to proceed safely, especially in the event of the viscosity of the product being accidentally reduced, for example in the case of ice-creams due to an increase in temperature: specifically, in such a case, according to the invention it is sufficient for the user to release the action of his fingers on the rotary actuator in order to terminate the dispensing operation by closing the valve under the action of a spring whose force may be large owing to the reduction obtained by the helical ramps as indicated hereinabove.

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The subject of the present invention is therefore a pressurized receptacle for dispensing a viscous product, the said receptacle comprising a container equipped with a dispensing valve, the said valve having a valve pot fastened  
5 on the container and a valve element which is secured to a dispensing stack which can be moved translationally in a sealed manner with respect to the valve pot and which is subjected to the action of a spring, the said valve element cooperating with a seat borne by the valve pot in order to close the valve under the action of the spring, it being possible to compress the spring  
10 in order to open the valve by an operating means which can be actuated by a user, the said operating means acting on the dispensing stack while bearing on the container such that the product to be dispensed is ejected from the receptacle through the valve and the dispensing stack, characterized in that, on the one hand, the dispensing stack bears on its outside, on the side  
15 directed away from the valve, at least one helical ramp of the same axis as the valve and in that, on the other hand, the operating means is a rotary collar fixed in translation with respect to the container, the said collar having at least one stud which can cooperate with the helical ramp or ramps in order to cause a translational movement of the dispensing stack when the collar is  
20 rotated.

In a preferred embodiment, the stud or studs of the collar can be moved substantially radially with respect to their helical bearing ramp or ramps between a first position in which there is cooperation of the stud with its  
25 associated ramp under the effect of an action by the user, and a second position in which there is no stud/ramp cooperation; the collar preferably consists of a base fastened on an attachment means for the container and of a support for the stud or studs; the collar can bear two diametrically opposed studs and the support for the stud or studs can have an elastic arm for each  
30 stud, it being possible for the user to act simultaneously on the two elastic arms to cause stud/ramp cooperation.

Advantageously, the dispensing stack has a body of revolution about an axis and the two helical ramps are symmetrical with respect to the said axis; each  
35 of the elastic arms of the collar can be joined by one of its ends to the base and can bear a stud at its other end.

Provision can be made for the region of the container where the valve is fastened to be a body of revolution about an axis and for the attachment

means for the container to be a crimping bead that is a body of revolution about the said axis, the said bead providing the connection between the container and a crimping flange of the valve pot.

5 In an advantageous embodiment, the dispensing stack consists of two coaxial cylindrical parts, one being a valve-element holder which is secured to the valve element and slides in a sealed manner in the valve pot, the other constituting a dispensing end-piece which forms a liner inside the valve-  
10 spring being a helical spring arranged between the said flange and the bottom of a cylindrical region of the valve pot in the form of a pocket, the sliding of the valve-element holder being guided with respect to the valve pot by that wall of the pocket which is closest to the axis of the stack, sealing being provided between the valve-element holder and the said wall of the  
15 pocket.

Provision can be made for the dispensing end-piece to bear on its outside the two helical ramps of the dispensing stack and to have a cylindrical housing in the form of a pocket which can be fitted over the part of the valve-element  
20 holder situated on that side of its flange where the valve element is not located; the flange of the valve-element holder can have at least one slot which receives a tongue integral with the dispensing end-piece, the said tongue providing, by snap-fastening, a removable coupling between the dispensing end-piece and the valve-element holder to allow uncoupling of  
25 the said end-piece.

Given that the action of the studs on the helical ramps during the rotation of the collar entails the risk of causing the dispensing stack to rotate in spite of the presence of the sealing provided between the said stack and the valve  
30 pot, provision is made for the dispensing stack and the valve pot to be able to be prevented from rotating relative to one another by an arrangement of grooves and ribs parallel to the axis of the said stack; the valve pot can have on its inside two diametrically opposed pairs of ribs and the dispensing stack can have, at its periphery, two corresponding pairs of grooves; the tongue of  
35 the dispensing end-piece can be positioned between the two grooves of a pair of grooves of the dispensing stack.

Advantageously, the collar bears on the inner face of its base a boss which is placed in a window made in the valve pot on that side of the crimping flange

where the valve element is not located; when the user rotates the collar, the boss comes out of its window by deformation of the base and the position of the said window on the valve pot corresponds, when the boss is housed therein, to a position of the collar in which the two studs are in line with the bottom points of the two helical ramps. Preferably, at least one helical ramp has at its top part a stop limiting the rotation of the collar: when, by rotation of the collar, the studs come into contact with the said stop, the dispensing stack and the valve element have been pushed down to the maximum extent, thus resulting in the maximum opening of the valve, which corresponds to the maximum throughput of the receptacle.

To provide a clearer understanding of the subject of the invention, a description will be given hereinbelow, by way of purely illustrative non-limiting example, of an embodiment represented in the appended drawing.

15

In this drawing:

- Figure 1 represents in axial section of the receptacle according to the invention in the position corresponding to a closure of the valve, the section being taken on I-I of Figure 3;
- 20 - Figure 2 represents in axial section the receptacle of Figure 1 in the position corresponding to a maximum opening of the valve, the section being taken on II-II of Figure 4;
- Figure 3 represents a plan view on III-III of Figure 1;
- Figure 4 represents a plan view on IV-IV of Figure 2;
- 25 - Figure 5 represents a detail V of an area of Figure 3;
- Figure 6 represents a section on VI-VI of the detail of Figure 5;
- Figure 7 represents an exploded perspective view of the three main subassemblies of the valve of the receptacle according to the invention;
- Figure 8 represents an elevation view of the dispensing end-piece on VIII-VIII of Figure 9;
- 30 - Figure 9 represents a plan view of the dispensing end-piece on IX-IX of Figure 8;
- Figure 10 represents a plan view of the dispensing end-piece on X-X of Figure 8;
- 35 - Figure 11 represents a view in axial section of the valve-element holder (not equipped with its valve element) on XI-XI of Figure 12;
- Figure 12 represents a plan view of the valve-element holder on XII-XII of Figure 11;
- Figure 13 represents a plan view of the rotary collar on XIII-XIII of

Figure 14;

- Figure 14 represents a sectional view of the collar of Figure 13 on XIV-XIV of Figure 13.

5 With reference to the drawing, it can be seen that the metal container of the pressurized receptacle according to the invention has been denoted by 1. This container 1 has a cylindrical shape and it opens to the outside via the collar of a conical neck 1a, the said collar being configured with a crimping bead 1b which surrounds the circular opening through which the inside of  
10 the container 1 communicates with the outside in the absence of any device fastened on the said crimping bead. A dispensing valve which has a valve pot 2 of cylindrical shape is fastened on the container 1, the valve pot 2 being equipped with a crimping flange 2a which is intended to bear on the crimping bead 1b, with interposition of a seal 3. The valve pot 2 is fastened  
15 on the container 1 in a known manner by means of a metal washer which is crimped to form a ring 4; the said ring 4 clamps the crimping bead 1b, the seal 3 and the flange 2a while additionally extending a little way vertically along the cylindrical wall of the valve pot, which is adjacent to the crimping flange 2a, on that side where the crimping bead 1b is not located.

20 The valve pot 2 has in its bottom part, that is to say in its part which is inside the container 1, a region constituting a cylindrical pocket 2b delimited between the outer cylindrical wall 2c of the valve pot 2, an inner cylindrical wall 2d coaxial with the cylindrical wall 2c and a wall 2e constituting the  
25 bottom of the pocket 2b, the said wall 2e being substantially perpendicular to the common axis of the cylindrical walls 2c and 2d. The wall 2e is secured to a frustoconical valve-element seat 5. A helical spring 6 has been placed in the cylindrical pocket 2b, the upper part of which spring has a diameter which is slightly smaller than the diameter of the lower part, which is housed  
30 in the cylindrical pocket 2b.

The valve of the receptacle according to the invention additionally has a dispensing stack which consists of two parts, namely a dispensing end-piece denoted by 7 in its entirety and a valve-element holder denoted by 8 in its  
35 entirety. The valve-element holder 8 consists of a cylindrical wall 8c which bears at its lower part, that is to say to the inside of the container 1, three star-shaped arms 8a which originate from the cylindrical wall 8c of the valve-element holder 8 and terminate in a sleeve 8b whose axis is coincident with the axis of the cylindrical wall 8c of the valve-element holder 8. The

sleeve 8b receives the connecting stem 9 of a conical valve element 10, the said connecting stem 9 being held in the sleeve 8b by a snap-fastening bead 9a. The conical tip of the valve element 10 points downwards and the large base of the cone formed by the valve element 10 has a housing in which a  
5 seal 11 in the form of a circular washer is placed, the said washer surrounding the connecting stem 9. The cylindrical wall 8c cooperates, by way of its bottom end, with the cylindrical wall 2d, with interposition of an O-ring seal 21; the cylindrical wall 2d constitutes a sliding guide for the valve-element holder 8. The cylindrical wall 8c of the valve-element holder  
10 8 has on its outside a peripheral flange 8d which is located approximately halfway between the two ends of the said cylindrical wall 8c. The spring 6 is placed between the wall 2e of the cylindrical pocket 2b and the peripheral flange 8d; the spring 6 bears on the peripheral flange 8d in the region where the flange 8d joins the cylindrical wall 8c of the valve-element holder 8.

15 The dispensing end-piece 7 is the part which defines the outlet duct 7a of the dispensed product. In the embodiment represented in the drawing, this outlet duct 7a has a star-shaped passage cross section, but it is clear that the duct 7a can have any cross section. The dispensing end-piece 7 has a cylindrical wall  
20 7b which constitutes an inner liner for the valve-element holder 8. That part of the dispensing end-piece 7 which is located between the outlet duct 7a on the one hand and the level of the peripheral flange 8d on the other hand forms a cylindrical pocket in which is housed that part of the cylindrical wall 8c which is located above the peripheral flange 8d, that is to say on that side  
25 of this peripheral flange where the spring 6 is not located. The dispensing end-piece 7 can thus be assembled on the upper part of the valve-element holder 8; the reference 7c has been used to denote the outer cylindrical wall which, together with the inner cylindrical wall 7b, defines the cylindrical pocket in which the upper part of the valve-element holder 8 is placed. The  
30 base of the cylindrical wall 7c constitutes a ring 7d whose underside rests on the peripheral flange 8d. The upper side of the ring 7d forms two helical ramps 71, 72 which are symmetrical to one another with respect to the axis of the dispensing end-piece 7. Each of these helical ramps terminates at its top point in a stop 73.

35 The valve whose main elements have just been described is in the closed position when the spring 6 brings the seal 11 of the valve element 10 against the seat 5 under the action of the spring 6, which is represented in Figure 1. The valve moves to the open position (see Figure 2) when the spring 6 is

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compressed in order to lower the dispensing stack 7-8 into the valve pot 2, this action driving the valve element 10: the product to be dispensed then passes between the valve element 10 and the valve-element seat 5; it passes through the region where the arms 8a are arranged, rises in the duct defined by the cylindrical wall 7b and escapes to the outside via the outlet duct 7a.

In order to compress the spring 6, a collar denoted by 12 in its entirety is used to act on the helical ramps 71, 72. The collar 12 consists of two subassemblies connected to one another, namely a base denoted by 13 in its entirety and a support for studs which is denoted by 14 in its entirety. The two subassemblies 13 and 14 of the collar 12 are moulded in one piece to form the said collar 12 and are interconnected by two connection regions 15, the said connection regions 15 being clearly visible in Figures 2 and 7; outside the regions 15, the two sub-units of the collar 12 are separated from one another.

The base 13 is fitted over the upper part of the valve pot 2 at the periphery of the latter. The upper part of the base 13 surrounds the valve pot 2 in its part situated above the crimping flange 2a; the lower part of the base 13 constitutes a skirt which surrounds the crimping ring 4 and which, via an annular boss 13a, snap-fastens below the said crimping ring 4. The establishment of this snap-fastening of the base 13 on the crimping ring 4 is made possible by the presence of slits 16 which are arranged at regular spacings around the periphery of the base to give the skirt the required flexibility for snap-fastening. The base 13 is thus kept in place on the container 1 without the possibility of translational movement with respect to the axis of the container, but it is free to rotate about the said axis, the rotation taking place around the ring 4, which acts as a guide.

The support 14 for the studs has two elastic arms 14a which are symmetrical with respect to the axis of the collar 12. Each of these arms 14a is joined by one of its ends to one of the connection regions 15 and bears at its other end a stud 14b which is arranged radially in line with a press pad 14c intended for the user's fingers to act on the arms 14a; each arm 14a has a shape approximating that of a semicircle when seen in plan view along the axis of the collar 12. When the user is not pressing on the pads 14c, the elasticity of the arms 14a makes it impossible for the studs 14b to come into contact with the helical ramps 71, 72. By contrast, when the user exerts a radial pressure on the pads 14c, the studs 14b can come into contact with the said helical

ramps.

The connection regions 15 are extended by rigid fingers 15a (Figures 3, 4, 7 and 13) on that side directed away from each of the elastic arms 14a, these fingers, as shown in Figure 4, coming into contact with the arms 14a by lodging in the cutouts 14d (Figure 13) of complementary shape made in the inner wall of the arms 14a when the user exerts a radial pressure on the pads 14c. In this position of the arms, the fingers 15a act as stops to keep the elastic arms in a horizontal plane.

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The base 13 bears on its inner face, above the region where the slits 16 are located, a slight boss 13b, which is able to lodge in a slot 2f made at the same level in the cylindrical wall 2c of the valve pot 2, just above the border of the metal strip which provides external crimping at the ring 4. If the base 13 is caused to rotate with respect to the container 1, the slight boss 13b comes out of its housing 2f and bears on the cylindrical wall 2c of the valve pot 2. The boss 13b allows indexing of the angular position of the base 13 with respect to the container 1; this indexing corresponds to the studs 14b being positioned in line with the bottom points of the helical ramps 71, 72.

20

In order to move the dispensing stack 7-8 translationally with respect to the valve pot 2 so as to open the valve, the user presses on the pads 14c, which causes the latter to be brought into contact with the helical ramps 71, 72, and the user then performs a rotational movement in the direction in which the studs move along the said ramps towards the stops 73. In this case, given that the collar 12 is fixed in translation with respect to the container 1, the dispensing stack 7-8 moves downwards, that is to say causes the valve to open through the lowering of the valve element 10. It is essential in this rotation movement to prevent the studs 14b being raised vertically when they move with respect to the ramps 71, 72 under the effect of the pressure of the spring 6, in which case the collar 12 would no longer be fixed in translation with respect to the container 1 and the dispensing stack would not move downwards with respect to the valve pot. This function is carried out by the fingers 15a. It is also essential in this translational movement that the dispensing stack is unable to turn with respect to the valve pot. Consequently, there have been provided in the flanges 7d and 8d two respective pairs of grooves 17 and 17a which are parallel to the axis of the dispensing stack and cooperate with two pairs of ribs 18 formed on the inner face of the cylindrical wall 2c of the valve pot 2. One of the pairs of

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grooves/ribs (17, 18) and (17a, 18) is located on either side of the slot 2f which constitutes the housing of the slight boss 13b; a tongue 19 integral with the dispensing end-piece 7 has been formed between the two grooves (17, 17a) of this pair, which tongue penetrates a slot 20 made in the flange 8d; this tongue has a nib 19a at its free end. Placing the tongue 19 in the slot 20 makes it possible, by means of the nib 19a, for the dispensing end-piece 7 to be kept in place with respect to the valve-element holder 8; however, the dimensions of the nib 19a with respect to the slot 20 and to the play existing between the dispensing stack and the cylindrical wall 2c of the valve pot 2 make it possible, through the elasticity of the tongue 19, to uncouple the dispensing end-piece 7 from the valve-element holder 8 by pulling on the dispensing end-piece parallel to its axis. In this way the dispensing end-piece can be removed, allowing it to be cleaned between two successive dispensing operations.

The receptacle according to the invention is assembled by first of all fastening the valve pot on the container 1 by crimping. Next, the spring 6 is put in place followed by the valve-element holder 8 and, while compressing the spring 6, the valve element 10 is fixed in its retaining sleeve 8b. The compressing action on the spring 6 is released and the dispensing end-piece 7 is positioned on the valve-element holder 8, which entails snap-fastening of the tongue 19. The valve-element holder 8 and the dispensing end-piece 7 are installed with engagement of the ribs 18 in the grooves (17, 17a). The collar 12 is then fitted by snap-fastening the base 13 on the crimping ring 4, the boss 13b being placed in its slot 2f. The studs 14b now face the bottom points of the helical ramps 71, 72.

The receptacle which has just been described is put to use by the user acting on the pads 14c. When the valve is in the closed state, the studs 14b are released outwardly with respect to the helical ramps 71, 72 because of the elasticity of the arms 14a, this making it possible for the dispensing end-piece 7 to be removed for cleaning. When the end-piece 7 is repositioned after cleaning, the tongue 19 snap-fastens into the slot 20; the ribs 18 are engaged in the grooves (17, 17a), which prevents any rotation of the dispensing stack with respect to the valve pot 2. When the user presses on the pads 14c and exerts a rotational force on the collar 12, the studs 14b bear on the helical ramps 71, 72, which causes translational movement of the dispensing stack towards the inside of the container 1; however, the dispensing stack is unable to turn about its axis by virtue of the cooperation

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of the grooves (17, 17a) with the ribs 18. At the start of the movement, the slight boss 13b was housed in its slot 2f, which ensured that the studs were located in line with the bottom point of the helical ramps 71, 72. Rotating the collar 12 with respect to the container 1 causes the valve element 10 to be lowered, the sealing between the seal 11 and the valve-element seat 5 to be removed and, consequently, the product to be discharged under the effect of the pressure which exists in the container 1. Maximum opening is achieved when the studs 14b come into contact with the stops 73. If an excessive force is accidentally exerted by the user, causing the studs 14b to pass beyond the stop, these studs drop down in line with the bottom point of the helical ramp on which they were not initially located, which immediately causes the valve to close under the action of the spring 6: this arrangement allows the dispensing operation to be carried out safely.

15 The important advantage of the receptacle according to the invention is that the product is discharged with very little pressure drop since the only passage where the cross section is slightly restricted is that which corresponds to the crossing of the valve-element seat 5. The pressure drop in the product as it exits is therefore minimum, which makes it possible to

20 dispense a high-viscosity product, such as an ice-cream, for example.

## Claims

1. Pressurized receptacle for dispensing a viscous product, the said receptacle comprising a container (1) equipped with a dispensing valve, the  
5 said valve having a valve pot (2) fastened on the container (1) and a valve element (10) which is secured to a dispensing stack which can be moved translationally in a sealed manner with respect to the valve pot (2) and which is subjected to the action of a spring (6), the said valve element (10) cooperating with a seat (5) borne by the valve pot (2) in order to close the  
10 valve under the action of the spring (6), it being possible to compress the spring (6) in order to open the valve by an operating means which can be actuated by a user, the said operating means acting on the dispensing stack while bearing on the container (1) such that the product to be dispensed is ejected from the receptacle through the valve and the dispensing stack,  
15 characterized in that, on the one hand, the dispensing stack bears on its outside, on the side directed away from the valve, at least one helical ramp (71, 72) of the same axis as the valve and in that, on the other hand, the operating means is a rotary collar (12) fixed in translation with respect to the container (1), the said collar (12) having at least one stud (14b) which can  
20 cooperate with the helical ramp or ramps (71, 72) in order to cause a translational movement of the dispensing stack when the collar (12) is rotated.

2. Receptacle according to Claim 1, characterized in that the stud or  
25 studs (14b) of the collar (12) can be moved substantially radially with respect to their helical bearing ramp or ramps (71, 72) between a first position in which there is cooperation of the stud (14b) with its associated ramp (71, 72) under the effect of an action by the user and a second position in which there is no stud/ramp cooperation.

30 3. Receptacle according to Claim 2, characterized in that the collar (12) consists of a base (13) fastened on an attachment means for the container (1) and of a support (14) for the stud or studs.

35 4. Receptacle according to Claim 3, characterized in that the collar (12) bears two diametrically opposed studs (14b) and the support (14) for the stud or studs has an elastic arm (14a) for each stud (14b), it being possible for the user to act simultaneously on the two elastic arms (14a) to cause stud/ramp

cooperation.

5        5.        Receptacle according to one of Claims 1 to 4, characterized in that the dispensing stack has a body of revolution about an axis and the two helical ramps (71, 72) are symmetrical with respect to the said axis.

10       6.        Receptacle according to Claims 4 and 5 taken simultaneously, characterized in that each of the elastic arms (14a) of the collar (12) is joined by one of its ends to the base (13) by a connection region (15) and bears a stud (14b) at its other end.

15       7.        Receptacle according to Claim 6, characterized in that the connection regions (15) are extended on the side directed away from each of the elastic arms (14a) by rigid fingers (15a) which act as stops for maintaining the elastic arms in a horizontal plane when the user actuates the operating means by rotating the collar (12).

20       8.        Receptacle according to either of Claims 3 and 4, characterized in that the region of the container (1) where the valve is fastened is a body of revolution about an axis and the attachment means for the container (1) is a crimping bead (1b) that is a body of revolution about the said axis, the said bead (1b) providing the connection between the container (1) and a crimping flange (2a) of the valve pot (2).

25       9.        Receptacle according to one of Claims 1 to 7, characterized in that the dispensing stack consists of two coaxial cylindrical parts, one being a valve-element holder (8) which is secured to the valve element (10) and slides in a sealed manner in the valve pot (2), the other constituting a dispensing end-piece (7) which forms a liner inside the valve-element holder (8).

30       10.       Receptacle according to Claims 5 and 9 taken simultaneously, characterized in that the valve-element holder (8) has a peripheral flange (8d), the spring (6) being a helical spring arranged between the said flange (8d) and the bottom of a cylindrical region of the valve pot (2) in the form of a pocket (2b), the sliding of the valve-element holder (8) being guided with respect to the valve pot (2) by that wall of the pocket (2b) which is closest to the axis of the stack, sealing being provided between the valve-element holder (8) and the said wall of the pocket (2b).

35

11. Receptacle according to Claim 5, taken alone or in combination with one of Claims 6 to 10, characterized in that the dispensing end-piece (7) bears on its outside the two helical ramps (71, 72) of the dispensing stack and has a cylindrical housing in the form of a pocket which can be fitted  
5 over the part of the valve-element holder (8) situated on that side of its flange (8d) where the valve element (10) is not located.

12. Receptacle according to either of Claims 10 and 11, characterized in that the flange (8d) of the valve-element holder (8) has at least one slot (20)  
10 which receives a tongue (19) integral with the dispensing end-piece, the said tongue (19) providing, by snap-fastening, a removable coupling between the dispensing end-piece (7) and the valve-element holder (8) to allow uncoupling of the end-piece (7).

13. Receptacle according to one of Claims 1 to 12, characterized in that the dispensing stack and the valve pot (2) are prevented from rotating relative to one another by virtue of an arrangement of grooves (17) and ribs  
15 (18) parallel to the axis of the said stack.

14. Receptacle according to Claim 13, characterized in that the valve pot (2) has on its inside two diametrically opposed pairs of ribs (13) and the dispensing stack has, at its periphery, two corresponding pairs of grooves  
20 (17).

15. Receptacle according to Claims 12 and 14 taken simultaneously, characterized in that the tongue (19) is positioned between the two grooves  
25 (17) of a pair of grooves of the dispensing stack.

16. Receptacle according to Claim 3, taken alone or in combination with one of Claims 4 to 15, characterized in that the collar (12) bears on the inner face of its base (13) a boss (13b) which is placed in a window (2f) made in the valve pot (2) on that side of the crimping flange (2a) where the valve  
30 element (10) is not located.

17. Receptacle according to Claims 4, 5 and 16 taken simultaneously, characterized in that, when the user rotates the collar (12), the boss (13b) comes out of its window (2f) by deformation of the base (13), the position of the said window (2f) on the valve pot (2) corresponding, when the boss  
35 (13b) is housed therein, to a position of the collar (12) in which the two

studs (14b) are in line with the bottom points of the two helical ramps (71, 72).

18. Receptacle according to one of Claims 1 to 17, characterized in that at  
5 least one helical ramp (71, 72) has at its top part a stop (73) limiting the rotation of the collar (12).

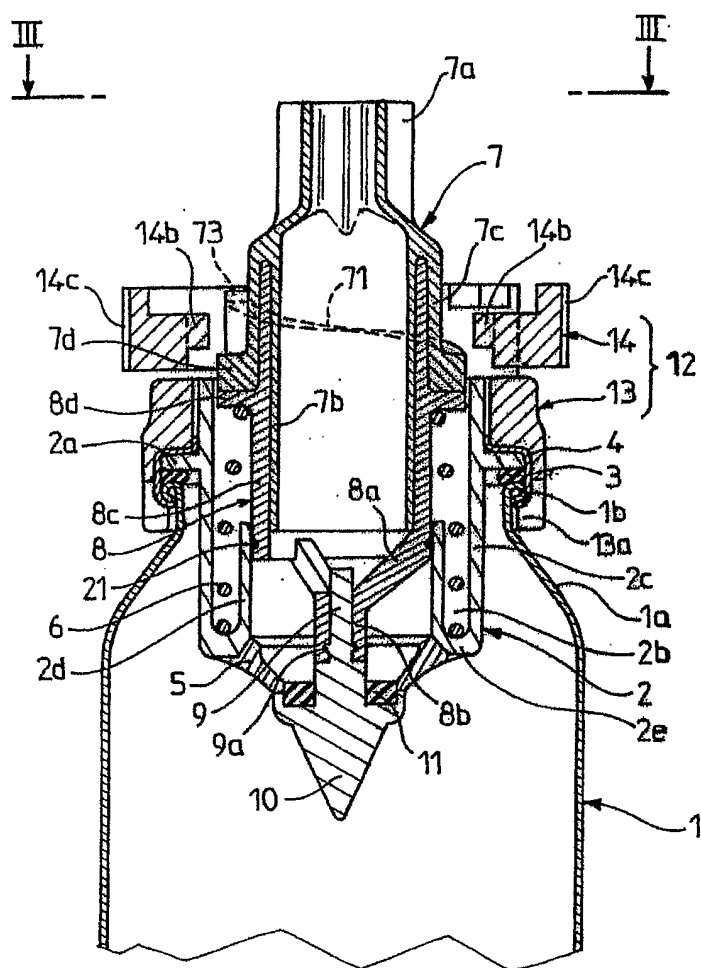
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FIG.1

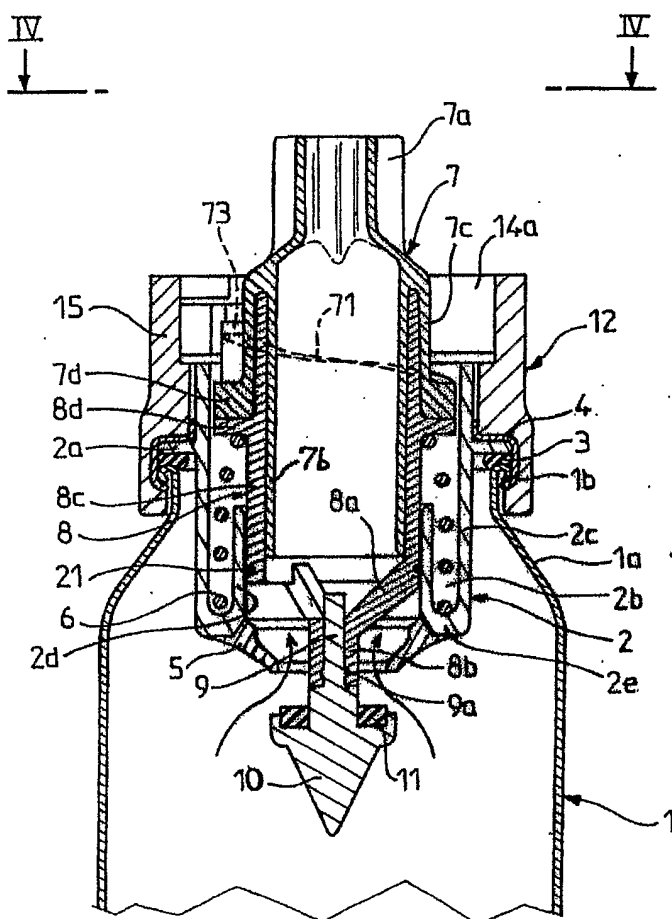


FIG. 2

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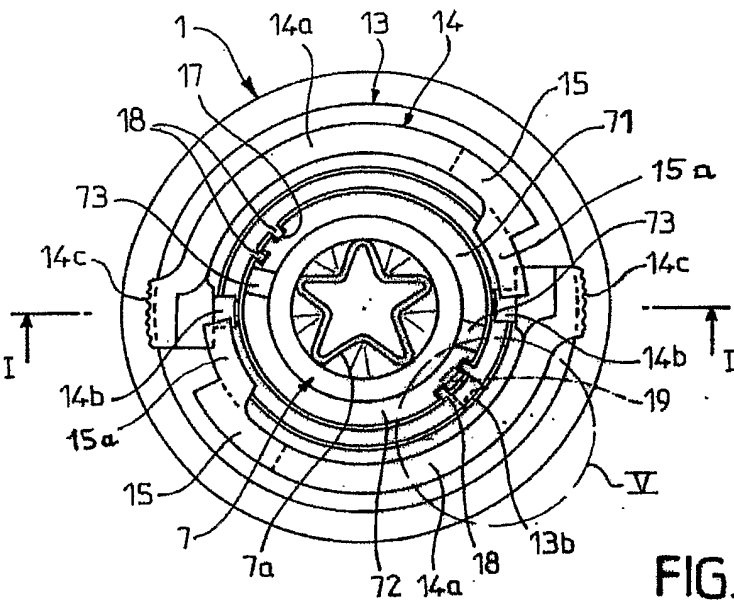


FIG. 3

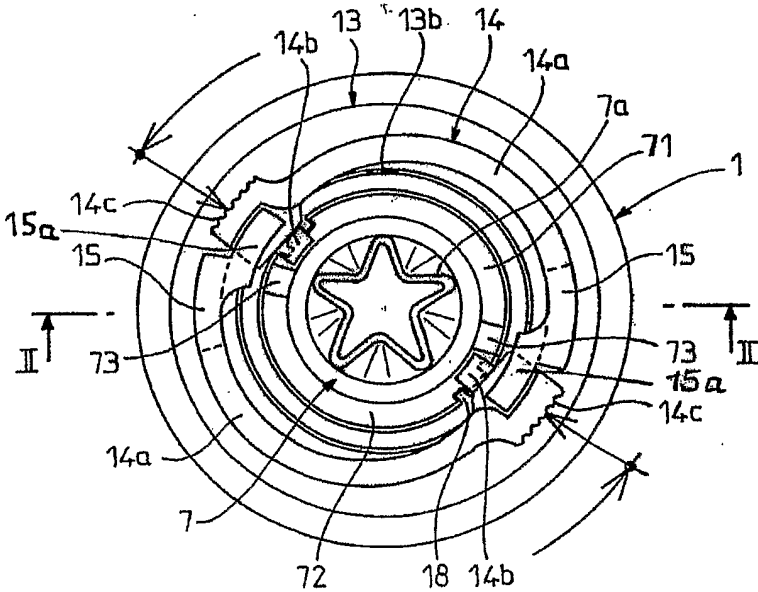


FIG. 4

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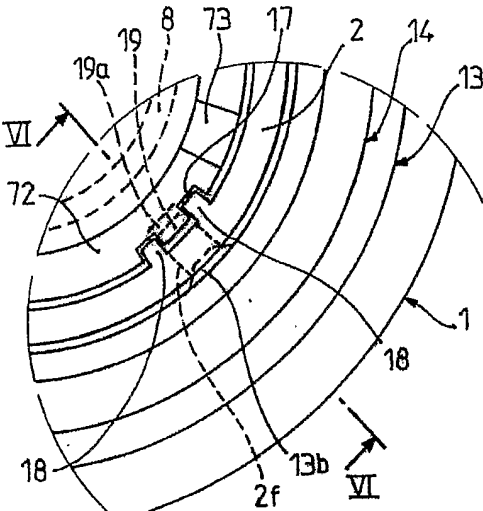


FIG. 5

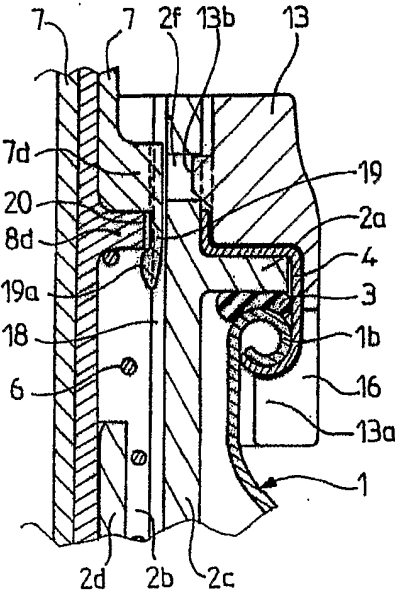


FIG. 6

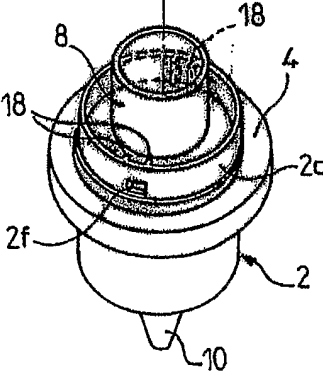
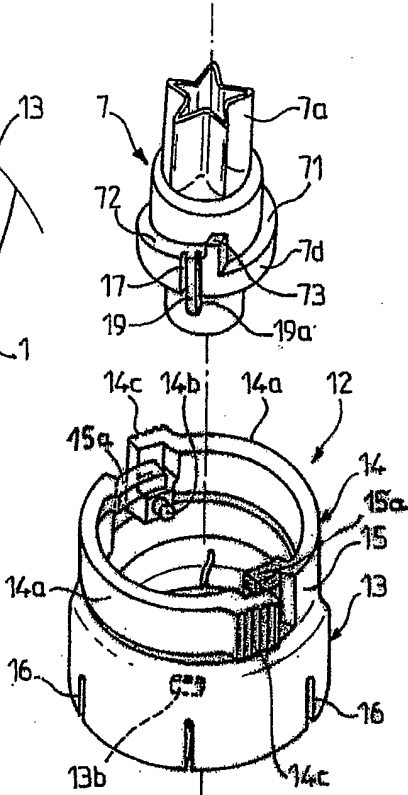


FIG. 7

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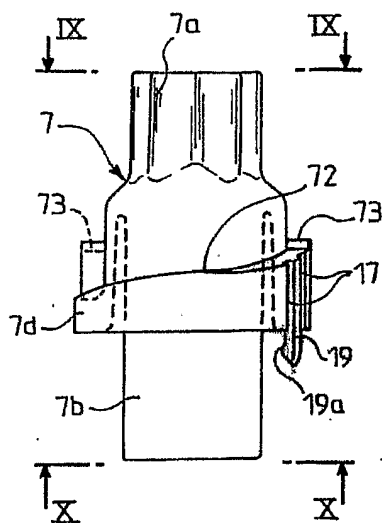


FIG. 8

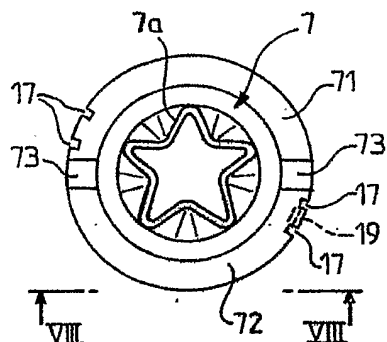


FIG. 9

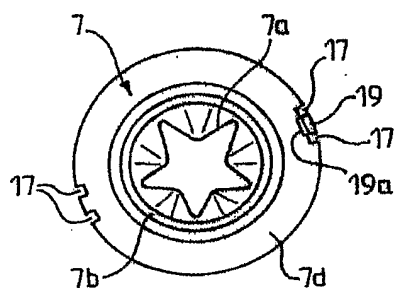


FIG. 10

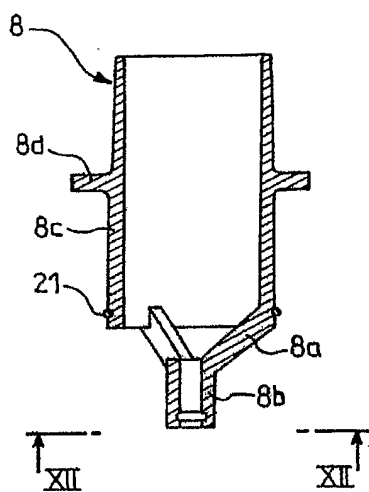


FIG. 11

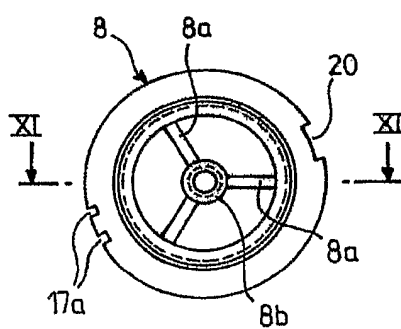


FIG. 12

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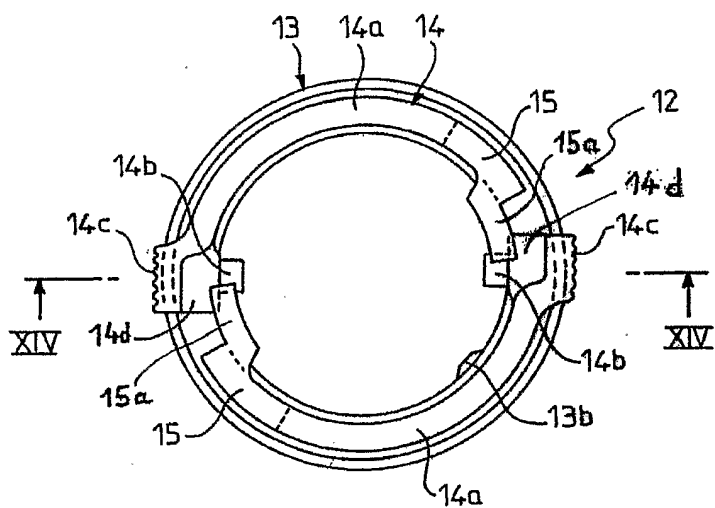


FIG.13

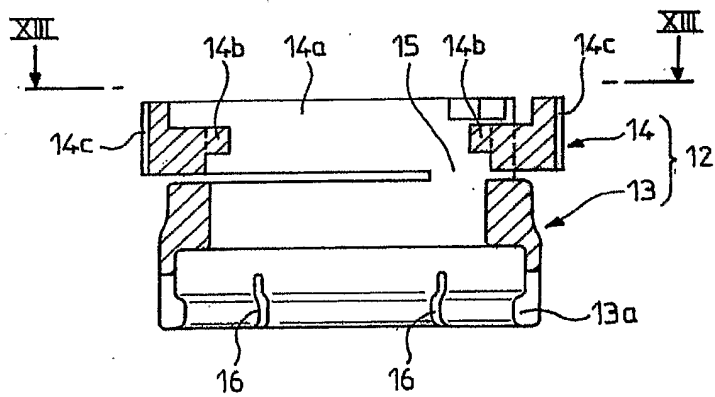


FIG.14

# INTERNATIONAL SEARCH REPORT

Int. Application No  
PCT/EP2005/002580

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B65D83/14

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages                                              | Relevant to claim No. |
|------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| A          | US 5 027 986 A (HEINZEL IRVING C ET AL)<br>2 July 1991 (1991-07-02)<br>the whole document                                       | 1-18                  |
| A          | WO 03/068632 A (RACKWITZ INGO ; THOMAS GMBH (DE)) 21 August 2003 (2003-08-21)<br>cited in the application<br>the whole document | 1-18                  |
| A          | US 3 844 448 A (SETTE J)<br>29 October 1974 (1974-10-29)<br>the whole document                                                  | 1-18                  |
| A          | US 3 804 296 A (WEBSTER M)<br>16 April 1974 (1974-04-16)<br>the whole document                                                  | 1-18                  |
|            | -/--                                                                                                                            |                       |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

1 June 2005

Date of mailing of the international search report

17/06/2005

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Pernice, C

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Int'l Application No  
PCT/EP2005/002580

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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|------------|---------------------------------------------------------------------------------------------------|-----------------------|
| A          | US 3 534 890 A (IANNACONE ANTHONY)<br>20 October 1970 (1970-10-20)<br>the whole document<br>----- | 1-18                  |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No  
PCT/EP2005/002580

| Patent document<br>cited in search report |   | Publication<br>date | Patent family<br>member(s)                                                                             | Publication<br>date                                                              |
|-------------------------------------------|---|---------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
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| WO 03068632                               | A | 21-08-2003          | DE 10206077 A1<br>AU 2003208807 A1<br>BR 0303071 A<br>CA 2475907 A1<br>WO 03068632 A1<br>EP 1474344 A1 | 28-08-2003<br>04-09-2003<br>15-06-2004<br>21-08-2003<br>21-08-2003<br>10-11-2004 |
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