LID WITH CAP FOR BEVERAGE RECEPTACLE

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ABSTRACT

Lid with cap for drink receptacles comprising at least one hole for the exit of liquid from the receptacle, at least one hole for the entrance of air into the receptacle, said air inlet incorporating a check valve allowing the entrance of air but not the exit of liquid therethrough; said valve being built into the body of the lid and having a plug element, by way of an axially sliding cap, allowing simultaneous front double closure of both holes, as well as an ergonomic swallowing of any liquid and aseptic use of the receptacle.
LID WITH CAP FOR BEVERAGE RECEPTACLE

OBJECT OF THE INVENTION

[0001] The present invention relates to a lid with cap for beverage receptacles or containers of the type that is coupled to an opening of the receptacle or container, such as PET bottles, although it also can be used in other types of containers, such as bottles used by cyclists or artists for example. Particularly, the lid with cap described in the application is applied to a liquid receptacle and comprises at least one hole for the exit of liquid from the receptacle and at least one hole for the entrance of air into the receptacle, said air inlet comprising a check valve allowing the entrance of air into the receptacle but not the exit of the liquid and a double plug element, or cap, in a single piece, axially movable. Said check valve is built into the lid thus forming part of the body of the lid, or in other words built into the same part of the lid, the same as the hole for the exit of liquid.

[0002] This invention applies to the sector of closures for liquid receptacles, and particularly those closures for receptacles for drinks, mainly water, isotonics, soft drinks, juices and dairy, among others.

BACKGROUND OF THE INVENTION

[0003] Closure devices for liquid receptacles or containers incorporating a hole for the exit of liquid from the receptacle and a hole for the entrance of air into the receptacle, such that said entrance of air aids in the exit of the liquid, are known in the state of the art. Examples of said closure devices are used in cups or bottles with a large diameter, used especially by young children and the elderly.

[0004] However, said devices are not widely applied to bottles, mainly to bottle lids for mineral water, soft drinks or isotonics drinks mainly due to the size of the lid and particularly to the surface of said lid. The inclusion of a hole for the entrance of air into the mentioned lids would cause the liquid to come out of the bottle both through the liquid outlet and through the air inlet due to the dimensions thereof. This is because the distance between both inlet and outlet is limited by the surface of the lid, making it necessary to arrange the inlet and outlet close to one another. When the surface of the closure device is larger, usually equal to or greater than 2.5 cm in diameter, it allows placing the liquid outlet and the air inlet at points spaced out from one another, so the aforementioned problem is not present or is present to a lesser extent.

[0005] The size of said surface also allows incorporating different mechanisms in the closure device to prevent the liquid from coming out through the air inlet. These mechanisms are formed by elements independent from the body of the lid of the receptacle per se, aiding the user or consumer in consuming the liquid. Said closure devices are primarily made up of different bodies or components coupled to one another forming an assembly, which further has different materials with different mechanical characteristics for the sole purpose of achieving the aforementioned objectives, primarily to aid young children or the elderly in consuming a liquid stored in the receptacle. The fact that the closure device is formed by different bodies or elements coupled to one another involves a manufacturing cost increase because the assembly and coupling of different components to the body of the lid must be added to the independent manufacture of the different components, sometimes with materials having specific characteristics such as latex or silicone. This means that these closure devices are intended to be reused due to their high cost compared with lids typically used in small volume PET bottles containing liquid for personal consumption and mainly used by children, the elderly and athletes. Likewise, these devices composed of different parts, have couplings among the different parts in which dirt, generated both by the use of the device and the moisture of the contained liquid, accumulates in them, forcing the disassembling of the device to proceed to clean separately each of the parts that make up said device. Obviously this accumulation of dirt/moisture is little hygienic, and can generate health problems to the person using the device, in addition to not being nice aesthetically. Therefore minimizing the number of components of the device is desired.

[0006] Unlike what has been described, the lid object of the present invention is designed for use in preferably single-use mass consumption products, mainly such as 0, 25 l, 0.33 l, 0.5 l, 0.75 l and up to 2.5 l PET recipients and normally used for mineral water, soft drinks or isotonics. However, this lid is particularly applied in small volume recipients, mainly up to 0.75 l, because they are normally used by users to drink directly from the recipient, and particularly children and athletes.

[0007] The lids used today in the aforementioned type of bottles or receptacles for mineral water, soft drinks, isotonics among others, only have one small hole for the exit of the liquid, so the consumer needs to suck to extract the liquid or compress the recipient or receptacle if the material thereof allows this to directly drink the stream coming out of the liquid outlet. If the consumer sucks, problems derived from said suction, such as the need to stop sucking to take a breath and be able to continue drinking and deformation of the receptacle due to collapse, being creased and/or crushed indiscriminately while sucking, causing a change in the shape of the receptacle, especially when it is made of PET, making it difficult to hold, will occur. These problems are worsened if the consumers are young children, convalescents or the elderly who need a break to take a breath, running the risk of drinking a lot of liquid since they cannot control the suction exerted with the subsequent risk of choking. A suction cup effect that is annoying for the consumer is created in lids of the state of the art when drinking.

[0008] By means of the present invention, it is possible to use in recipients or receptacles of the state of the art lids having the same cost or a cost very similar to that used today having a single outlet for bottles with the aforementioned capacity, but incorporating an added function, which is allowing consuming the liquid without the problems of lids currently used with a single hole.

[0009] In summary, in the state of the art, no closure device or lid for bottles or receptacles is known to have a small entrance surface, usually around 2.5 cm in diameter, incorporating on the surface of the same body of the lid or closure device a hole for the exit of the liquid and a hole for the entrance of air with a valve controlling the entrance of air into the receptacle and preventing the exit of the liquid contained therein, or check valve, said valve being built into the body of the lid or closure device forming a single body or part made from the same single material, i.e., said valve is part of the same part as the lid with its liquid outlet.

[0010] As mentioned before, the lids of the state of the art incorporating or describing check valves are made with several bodies in the sense that they are made up of several
elements coupled to one another, the valve being partially made from a material that is latex or silicone. These materials prevent manufacturing a lid in a single body with sufficient rigidity for being coupled to a recipient or receptacle by means of threading for example, not even by using simple and highly productive manufacturing processes that allow obtaining a product with a cost that is very similar or identical to that used today in the aforementioned recipients, i.e., with a cost similar to lids with a single liquid outlet.

Additionally, the caps used in containers for isotonic drinks have a single hole for the exit of the liquid that is closed via a closure device coupled to the cap. Said closure device moves axially to the hole for liquid outlet allowing opening or closing the cap with the mouth, without having to use the hands, which makes it particularly useful for use by athletes. However there is no knowledge of any lid incorporating said device and having a hole for the entry of air into the receptacle equipped with a valve.

A problem common to all known lids of the state of the art and with the characteristics of those previously described is that they do not guarantee the asepsis of the liquid included in the receptacle, since they do not have effective closure means to prevent the entry of air through the two holes, for liquid and air, with the consequent risk of infection of the content. This problem of infection can occur in different conditions:

During the practice of sport in adverse situations, more specifically when the athlete circulates by dirty areas such as e.g. muddy areas or swampy areas that can release unwanted items that are deposited on the lids of the receptacles.

During the use of the cap with dirty hands, or

During storage in the refrigerator, after having used the lid to cool the remaining content, since it prevents outside air from entering the receptacle, since lowering the temperature causes a depression by cooling inside the receptacle and air can enter by the air inlet through the valve if the hole is not tightly closed.

The former problem is usually avoided by incorporating a top or cover to the lid, which can be integral or not with the same, however said top or cover, which may be useful in certain circumstances, is quite useless in the receptacles used by athletes.

Likewise, another problem in the lids of small dimensions with two holes, one for liquid outlet and another one for air inlet, is that the user, when drinking through the liquid outlet can plug with their mouth the air inlet, what would prevent the correct operation of the lid since it prevents the entry of air into the receptacle, leading to the use of the lid as a lid with a single hole.

The lid with cap object of the invention that has two holes, one for liquid outlet and another one for air inlet, prevents the previous problems posed by the caps of the state of the art known thanks to the double plug element or cap with axial displacement arranged. Said axial displacement of the cap or plug element, therefore allows simultaneous closing of both holes in the lid.

DESCRIPTION OF THE INVENTION

The object of the present invention is therefore a lid formed by a single body or part with a top surface and a perimeter side wall which can be fitted on an opening of a liquid receptacle comprising at least one hole, which is preferably open, for the exit of liquid from the receptacle and at least one hole for the entrance of air into the receptacle, the lid having coupling means for coupling to said receptacle which are preferably located in the perimeter side wall of the lid, and a check valve for the entrance of air located in the air inlet, allowing the entrance of air into the receptacle but not the exit of the liquid, such that both said coupling means and said valve are built into the body of the lid forming a single body or part made from the same material, as well as a plug element or cap which moves axially with respect to the cross-section of both holes, producing the simultaneous, front individual opening or closure of said holes.

The aforementioned material is preferably a plastic material such as polypropylene or polyethylene, which has flexibility in small thicknesses of material but not when such thicknesses increase. Said liquid can be any liquid which is stored in a receptacle for being consumed preferably by sucking directly on the recipient or receptacle through the exit hole located on the lid, for example, water, soft drinks, isotonic drinks or even juices and dairy. The liquid can also be consumed when pressing on the recipient, when it is compressible, such that a stream of liquid comes out through the outlet, so the consumer could drink the stream without coming into contact with the lid.

The valve of the lid is an air check or control valve allowing the entrance of air when sucking the liquid contained inside the recipient or receptacle but preventing the exit of the liquid when the liquid outlet is not sucked on, thus allowing the exit of the liquid only through the hole intended for such purpose. In other words, when the user sucks through the liquid outlet to drink, the valve opens allowing the entrance of air into the receptacle, thereby aiding in drinking the liquid. It is also important to stress again that said check valve is built into, forming part of the body or part of the lid, therefore being made from the same material as the body of the lid, the same plastic. In this way, when the consumer drinks, they can regulate the flow of liquid they want by controlling the suction and as a result the entry of air in the receptacle, i.e. the greater the suction, a greater flow is achieved and vice versa. When the suction stops, the valve is automatically closed, thus preventing both the entry of air and the exit of liquid.

The lid is fitted on the receptacle through the fixing or coupling means which are preferably a threading or pressure elements and they are preferably arranged on the inner surface of the perimeter or side wall of the lid, the wall located in the perimeter and perpendicular to the surface of the lid in which the liquid outlet and air inlet are located. Said fixing means may also be a bayonet, retention, sonotrode welding, gluing or other physical or chemical anchoring system for its attachment or fixation to the receptacle.

Preferably, said check or control valve, made of the same material as the rest of the body, is formed by a tubular body, not necessarily cylindrical, with two ends such that a first end is located in contact with the bottom surface of the lid, with the walls of the body or tubular conduit surrounding the air inlet on the bottom side of the lid, and the second end, which is free and opposite the first end, has walls in contact with one another closing the tubular body, such that a longitudinal section of the body of the valve in the closed position has an approximately triangular shape. Therefore when the lid is fitted on receptacle, said tubular body is inserted therein, such that in the rest position the tubular body is integral with the bottom surface of the lid is closed at its free end and in the working position when someone is drinking, said free end
opens, allowing the circulation of air into the receptacle, having an approximately rhomboidal longitudinal section.

[0024] Depending on the dimensions of the surface of the lid, said surface could include one or more holes for the exit of the liquid, as well as one or more holes for the entrance of the air. It should be pointed out that due to the small dimensions of the available surface in the lids, the possibilities of improving the exit of the liquid and of reducing the turbulence of the liquid during said exit are limited, however, by means of the present invention both objectives are achieved in comparison with the lids known in the state of the art which do not propose solutions to the mentioned problems.

[0025] The air inlet can have any transverse geometric configuration, such as for example, the form of a groove, of a circle, elliptical, etc., so that the tabular body can also have any geometric configuration, provided that the free end of the tubular body in the rest position is closed. The first end of the tubular conduit in contact with the surface of the lid can also coincide with the perimeter of the air inlet, such that the first end of the tubular body has the same shape as the air inlet, said tubular body being an extension of the lid into the receptacle. The air inlet is preferably a groove surrounded by the tubular body which in this case is not cylindrical, although it could be.

[0026] As mentioned above, the tubular body is built into the lid, forming a single part or body with the lid after the injection or other thermoplastic transformation of the part or body of the lid during the same manufacturing process. The second end or free end of the tubular conduit, opposite the end integral with the surface of the lid, has a cut or fissure therein allowing its automatic opening. This cut or fissure can be made during the injection process itself or it may be made by a cutting or insertion element during the injection or thermoplastic transformation process itself.

[0027] By means of the configuration of the lid with the check valve, the user wanting to drink the liquid from the receptacle through the liquid outlet will suck the liquid through the outlet. The valve allows the entrance of air into the receptacle because said suction created by the user causes a pressure drop inside the receptacle that forces the membrane-shaped walls of the second free end of the tubular body to separate, thereby allowing the entrance of air into the receptacle and therefore aiding the liquid in flowing through the liquid outlet without forming said receptacle and with a minimum controlled suction force. When the user stops sucking, the walls of the second end or free end come into contact with one another again, thereby closing the conduit of the tubular body and preventing both the entrance of air and the exit of liquid through the air inlet. Also due to the check valve, the lid object of the present invention allows the user to drink without needing to stop the consumption to take a breath and continue drinking, as occurs in lids with one liquid outlet currently used in PET receptacles, PET recipients or preferably PET bottles.

[0028] The lid and the cap or plug element object of the present invention have in addition, as an essential feature, the cap with closing elements, by way of plugs with axial displacement the purpose of which is, as mentioned above, to ensure the closing and opening of the two holes located on the lid, simultaneously, and preventing that during the use of the lid, the user plugs the air inlet, which could cause an undesired operation of said lid. The double plug element ensures, therefore, the correct operation of the lid, preventing the air inlet from being clogged or plugged in an unwanted manner during its use and it also ensures the asepsis of the liquid of the receptacle under adverse circumstances. The lid and cap system with plug elements, object of the invention, is of special application, although without limitation, in recipients or bottles of regular use by athletes that do not require a top or cover integral with or independent from the lid, to facilitate consumption of the liquid by moving the cap or plug with the mouth without using the hands. Then the consumer will be able to drink the liquid by sucking or the user could drink a stream.

[0029] The cap or plug element will move axially with respect to the cited liquid outlets and air inlets, along at least one guiding element which ensures the movement of the cap or plug to be axial with respect to said holes. The upward axial movement of the plug allows the opening of both holes whereby the consumer will be able to access the liquid in the receptacle, while the opposite movement closes both holes simultaneously at the user's will.

[0030] Said cap or plug element moves axially along a guiding element of the same, which is preferably arranged in the liquid outlet. Said guiding element, preferably coaxial with respect to the aforementioned liquid outlet, remains in that position by the action of at least three ribs that extend from the bottom of the surface of the lid to the bottom of the guiding element.

[0031] Likewise, and in order to achieve that the closure of both holes is carried out at the same time and also to prevent the user from plugging the air inlet during the use of the invention, the cap or plug has a surface that extends to cover the air inlet, said surface being slightly curved to make more comfortable its use by the user when placing the lips over it. Said surface that extends over the air inlet, comprises a bottom projection intended for plugging said hole. The cap or plug, also includes a tubular body, coaxial with the liquid outlet and introduced in it, the outer surface of the tubular body of the plug being in contact with the inside surface of the liquid outlet.

[0032] Particularly, the liquid outlet is surrounded by a coaxial wall located in the top part of the surface of the lid and has a guiding element with the same section as the liquid outlet, preferably coaxial cylindrical, although it could be elliptical or ovoid-shaped or other, located inside it and extending from the bottom part of the surface of the lid to above the coaxial wall located outside the outlet, said guiding element being secured to the bottom part of the surface of the lid by means of ribs. The guiding element thereby remains centred with respect to the liquid outlet as a result of said ribs, there preferably being three equidistantly separated from one another, although other technical variants of axial movement can be carried out. Said guiding element is plugged by its outer end. Like the valve described above and also built into the lid, this structure forms the body or part of the lid as it is built per se into the body of the lid and is made from the same material by means of, preferably, an injection process or other thermoplastic transformation.

[0033] The cap or plug of the lid is located on said cylindrical element, said plug of the lid having a body with the same section as the liquid outlet, preferably a hollow cylindrical tubular body open at its two ends, wherein the guiding element of the cap is inserted, said cap or plug being able to move along said guiding element. The movement of the plug causes, in a first position, the outer end of the guiding element to press against the outer opening of the body of the plug, so the lid would be closed, and in a second position, the lid would be open because the ends of the guiding element of the lid and
the tubular body of the plug or the plug itself are not in contact. When the lid is open, the liquid circulates between the outer surface of the guiding element of the lid and the inner surface of the tubular body of the plug or plug, the liquid thus coming out through the opening located at the top end of the tubular body of the plug or plug. The outer surface of the body of the plug is in contact with the inner surface of the wall determining the outlet of the lid and coaxial to said outlet, to the guiding body of the lid and to the body of the plug. Said body of the plug can have stops or elements limiting its movement to prevent it from coming out of its position between the guiding element of the lid and in the liquid outlet.

The cylindrical body of the plug incorporates, as mentioned above, an outer surface, which is deployed by way of a skirt from the top end or opening of the tubular body of the plug and around this, defining side, vertical and horizontal outer surfaces, preferably curved surfaces, which have a dual function. On one hand they accommodate the lips on said vertical outer surfaces when drinking, and on the other they prevent said lips from being able to plug the air inlet, and therefore the valve, when accommodated on the horizontal outer surfaces at the base, appendix or extension intended to cover the air inlet, which could entail improper operation of the lid and cap or plug assembly.

The top surface of the lid can be slightly recessed with respect to the perimeter wall such that the horizontal outer surfaces of the plug are inserted therein ensuring the closure of both the air inlet valve and of the liquid outlet without projecting above the body of the lid.

In an alternative construction of the surfaces of contact between the lid and the cap or plug, restraint means are arranged between the tubular body of the cap or plug and the coaxial wall that surrounds the liquid outlet of the lid in order to allow different positions of the cap with respect to the lid to adjust the output flow rate of liquid. By means of these restraint means it is possible to achieve the comfort desired by the user while drinking since they are able to graduate the suction effort according to their needs.

Likewise, the lid can incorporate a top or cover covering the plug, said top or cover being integral to or independent from the body or part of the lid, and it could even become part of said piece or body.

DESCRIPTION OF THE DRAWINGS

To complement the description that is being made for the object of the invention and to aid in better understanding the features distinguishing it, a set of the following drawings is attached to the present specification which depict the following in an illustrative and non-limiting manner:

FIG. 1 shows an embodiment of a closed lid object of the present invention with a cap or plug.

FIG. 2 shows the lid of FIG. 1 open in which the flows of incoming air and liquid projection are shown.

FIG. 3 shows the lid of FIG. 2 being used by a user and showing the outside air flowing entering the inside of the container through the lid of the invention.

FIG. 4 shows a section of the partially open lid with a cap or plug.

FIG. 5 shows a section of the completely open lid with a cap or plug showing the flows of air and liquid.

FIG. 6 shows a detail of the section of FIG. 5.

FIG. 7 shows a bottom view of a lid with a cap or plug.

FIG. 8 shows a detail of a section of an alternative lid with a cap or plug, in which there are restraint means between the tubular body of the cap or plug and the coaxial wall that surrounds the liquid outlet of the lid.

PREFERRED EMBODIMENTS OF THE INVENTION

In view of the mentioned drawings, an example of preferred embodiment of the invention is described below.

FIGS. 1 to 7 show an example of embodiment of a lid according to the present invention, a lid 100 for preferred use by people practicing a sport since they allow drinking the content of the bottle without needing to remove a cover or top, the plug element 700 incorporated in the lid 100 for simultaneously opening or closing the lid 100 is moved axially simply using the mouth. It is evident that this lid can be used also in receptacles with liquids that are not isonic drinks, for example water drinks, since the contents of the receptacle do not affect the operation of the lid, as well as for other uses that are not the practice of sports.

Lid 100 has a liquid outlet 170 delimited by a coaxial wall 130 and an air inlet 300 with a valve 310 forming a single part or body of the lid 100. The cap, plug element or plug 700, moves axially with respect to both holes, plugging or opening the same at the same time. In this example, the diameter of the lid is approximately 3.9 cm, a typical diameter in 0.5 litre recipients containing isonic drinks, and the distance between the axis of symmetry of the liquid outlet 170 and the axis of symmetry of the air inlet 300 is approximately 1.4 cm, said distance being able to range between 1 and 1.7 cm, approximately. Likewise, the material used for the manufacture of the lid is, preferably, a low density polyethylene or polypropylene resin, with a density of between 0.85 and 1.2 g/cm³, most preferably between 0.9 and 0.95 g/cm³. Some of the materials that can be used are PP575P or PP412MN40 by SABIC, PR280P1M by IPSLEN (REPSOL) or IDPE LD 1043R by ExxonMobil.

The cap 100 has as fixing means a receptacle or bottle 60, a threading 21 on the perimeter wall 22 of the cap 100 to fit the neck of the bottle 60.

The lid 100 allows consumption of the drink inside the bottle 60 comfortably and without the risk that the liquid exits the same through an opening 710 in a cap or plug element 700 built into the plug. Thus, a consumer will suck through the opening 710 of the plug 700 after having displaced the same axially upwards, through which the liquid will exit passing through the liquid outlet 170, creating a depression in the interior of the bottle 60 which will cause the opening of the check valve 310 and therefore the entry of air inside the bottle 60 through the air inlet 300. When no depression is generated, because there is no suction, the valve 310 is closed and remains in this situation.

Valve 310 is part of the body or part of the lid 100, since it is manufactured in the same material as said lid and in the same manufacturing process, so that the various components of the lid form a single piece or body, obtained by a single stage of an injection or thermoplastic transformation method.

The check valve 310, consists of a tubular body that forms part of the body or part of the cap 100 itself, with the walls of the first end of said tubular body surrounding the air inlet 300, and the walls of the second end of said body, in contact with each other, by way of membranes, closing the duct of the tubular body 300.
The liquid outlet 170 is circular, and it may have other configurations, such as an ellipse, ovoid, among others, and is surrounded by a coaxial wall 130, cylindrical in this example, demarcating it and located at the top or outer part of the surface 120 of the cap 100. Said liquid outlet 170 has a coaxial guiding element 110 located inside of it and extending from the bottom or inner part of the surface 120 of the lid 100 to above the top end of the coaxial wall 130 of the outlet 170. Said guiding element 110 is coaxial to the liquid outlet 170 and therefore to the coaxial wall 130, due to the arrangement of equidistant ribs 140, at least three and preferably four, keeping it in said position. The ribs 140 extend from the bottom part of the surface of the cap 120, in particular from the liquid outlet 170 perimeter, to the bottom or inner end of the cylindrical guiding element 110 of the lid where a protruding ring 160 is arranged. The cylindrical guiding element 110 is plugged on its outer top end, since in addition to guiding the cap or plug element 700 in its axial displacement, it also collaborates with this to cause the closing or opening of the two holes 170, 300.

This structure, together with the valve 310 communicating with the air inlet 300, forms the body or part of the lid, i.e. one single part construction, since it is built into the body of the lid per se and is made from the same material by means of the same injection process.

As mentioned before, on the lid 100 there is a cap or plug element 700 that has two main functions; to ensure the asepsis of the liquid contained in the recipient on which the cap is arranged when moving axially with respect to both holes 170, 300, and to prevent that a user unintentionally plucks the air inlet 300 when drinking, as for example with the mouth or with a finger, preventing the proper operation of the lid.

Said plug element 700, has a tubular body, 740, 760, complementary with the coaxial wall 130 that surrounds the liquid outlet 170 and that moves inside to this, the exterior wall of the tubular body 740, 760 being in contact with the inner surface 150 of the coaxial wall 130 of the lid 100. Said cap 700, has at its upper end an opening 710 through which the liquid will flow during its exit from the receptacle. From said opening 710 the cap 700 has a surface 770 that surrounds the tubular body 740, 760 and on which the user will place their lips to drink. Said surface 770 extends from the opening 710 of the cap or plug, surrounding the tubular body 740 and separating from it as it moves away from said top end or opening 710 by way of a skirt. The outside of said surface 770 has soft and curved shapes so that the user places their lips on the surface comfortably. Likewise, this surface has an appendix or extension 730, which moves away from the tubular body 740, 760 to about half the length of said body and which is intended to cover the air inlet 300. Said appendix or extension 730 is intended to allow the plugging of the air inlet 300 simultaneously with the plugging or closure of the liquid outlet 170, and also to prevent that the lips of the user plug the air inlet 300 when said user is drinking.

The plug element 700 of the lid 100 is coaxially located around the cylindrical guiding element 110 serving as a vertical guide for the axial movement of the plug 700 along the guiding element 110. Said plug element 700 comprises, as mentioned before, a hollow 740, 760 cylindrical body complementary with the cylindrical wall 130 open at its two ends, and inside of which the cylindrical guiding element 110 of the lid 100 is inserted, the plug 700 being able to move axially along said cylindrical guiding element 110 between two limit positions, of maximum opening when the plug 700 is located raised with respect to the body or part of the lid 100 and closing when the plug 700 is descended with respect to the body or part of the lid, as well as with other intermediate opening positions.

When the lid 100 is closed the cap or plug 700 moves downwards, such that both holes are closed and, particularly, the liquid outlet 170 is closed due to that the outer or top end of the cylindrical guiding element 110 presses against the outer opening 710 of the cylindrical body 740, 760 of the plug 700. Likewise, in this closing position and to ensure the closure of the air inlet 300 on the inside of the receptacle, the plug element 700 has on the bottom part of the appendix 730 of the surface 770, a projection 720 complementary with the shape of the air inlet 300 such that when the cap or plug 700 is in closed position, the projection 720 is inserted into the inlet 300.

In the opening position, the cap or plug 700 moves axially upwards along the guiding element 110, such that the outer opening 710 of the plug 700 is raised with respect to the outer or top end of the cylindrical guiding element 110 and the projection 720 is separated from the air inlet 300.

When the lid 100 is open, i.e. the cap or plug 700 is raised with respect to the lid 100, the liquid L circulates between the outer surface of the cylindrical guiding element 110 of the lid 100 and the inner surface of the cylindrical body 740, 760 of the plug 700, the liquid L thus coming out through the opening 710 at the outer end of the cylindrical body 740 of the plug 700. The outer surface of the cylindrical body 740 of the plug 700 is in contact with the inner surface of the wall of the lid 130 coaxial to the outlet. Said plug 700 can have at the bottom end of the tubular body 760 stops 750, by way of wedge, that limit the axial movement of the plug 700 and preventing the plug 700 itself from coming out of its position and disengaging from the part or body of the lid 100. Said stops 750 are introduced along with the tubular body 740, 760 in the liquid outlet hole 170, such that when they are fully introduced they contact the bottom of the surface 120 of the lid 100, in particular they contact the periphery of the liquid outlet 170.

When the lid 100 is closed, i.e. the plug is descended, the bottom end 760 of the cylindrical body 740 of the plug 700 rests on a protruding ring 160 arranged at the inner or bottom end of the cylindrical guiding element 110.

To use this lid 100 with plug 700, the user, with their mouth, moves axially outwards or upwards the plug 700, such that the liquid L will circulate between the tubular body of the plug 740 and the guiding element 110 of the lid 100, through the liquid outlet 170, and the air A can circulate from the outside, when necessary, through the valve 310 and the air inlet 300, since both holes 170 and 300, have been opened at the same time. By sucking through the outlet 710 of the plug 700 the valve 310 is opened allowing the entry of air inside the bottle or receptacle from the outside. When the user does not want to drink any more, they can push the plug 700 down, causing the closure of both holes 170, 300 simultaneously and therefore ensuring the asepsis of the contents of the receptacle.

As mentioned above, to facilitate and make more comfortable the use of the cap or plug by the user, said plug 700 incorporates a vertical surface 770 externally surrounding the cylindrical body 740, 760, which is preferably curved, for the purpose of accommodating the lips on said surface. Likewise, at the bottom or base of the surface 770 of the cap
or plug 700 there is arranged an appendix 730 of the surface, slightly curved and horizontal for, in addition to allowing support for the lips, preventing the lips from plugging the air inlet 300, and therefore that the valve 310 prevents the air A from entering the bottle.

[0065] As shown in the figures, the top surface 120 of the lid 100 can be slightly recessed with respect to the top perimeter wall 180 of the same such that the bottom ends 775 of the surface 770 of the plug 700 are introduced in said recess, resting on the surface 120, when the lid 100 is closed, that is, with the plug 700 descended.

[0066] The lid 100 with the cap or plug 700 may additionally have a top or cover (not shown) that rests on the body or part of the lid 100, covering the cap or plug, and this cover forming part of the body of the lid 100, forming a single part with the same, or conversely, being an independent part. To help close the top or cover over the lid 100, this can include a shoulder 190 on its top perimeter wall 180.

[0067] FIG. 8 shows an alternative construction to the one detailed above of the contact surfaces between the lid 100 and the cap or plug 700, in particular it shows a detail of a section of a lid 100 with cap or plug 700, having restraint means (135, 765) between the tubular body (760) of the cap or plug (700) and the coaxial wall (130) that surrounds the liquid outlet (170) of the lid (100). Unlike the previous sections, in this, the air inlet is not shown since the section of the lid-cap represents an orthogonal to the previous ones. In the example shown, this restraint means consist of fissures (765) made on the tubular body (760) of the cap or plug (700) in which is housed a projection (135) existing on the top end of the coaxial wall (130) that surrounds the liquid outlet of the lid (100). These restraint means determine intermediate positions of opening of the lid with cap object of the invention, by blocking the situation of the cap or plug (700) with respect to the lid (100), in particular, of the tubular body (760) of the cap or plug (700) with respect to the coaxial wall (130) of the lid (100). In the example of the figure, four fissures (765) are arranged on the tubular body (760) in which the projection (135) of the coaxial wall (130) will be housed, determining four positions of an element with respect to the other, a position of total opening, one of total closure and two intermediate positions. The location of the cap or plug (700) with respect to the lid (100), regulates the flow rate of liquid output from the receptacle (60) also graduatin the suction effort of the user. This alternative construction allows adapting the flow rate of liquid to the demands or needs of the user, controlling the flow rate depending on the suction effort. A lid (100) with cap or plug (700) with four possible positions is represented in FIG. 8:

[0068] The position shown in the figure does not allow the passage of liquid, being the extreme position of blockage or closure, and the cap or plug (700) being located in the lowest position with respect to the lid (100), so that the projection (135) of the coaxial wall (130) of the lid (100) is housed in the top fissure (765) of the tubular body (760) of the cap (700).

[0069] Another position would consist of placing the projection (135) in the second fissure (765) situated immediately below the previous one. In this position the flow rate of liquid output when the user sucks would be small, this being a position suitable for users who want a small flow rate.

[0070] The next position would place the projection (136) in the third fissure (765), after the previous one, such that the flow rate of liquid would be greater than the former.

[0071] The last position is the one for total opening and maximum flow rate, placing the projection (135) in the last fissure (765). This position is ideal for an athlete undergoing a hard effort and requiring a rapid rehydration and therefore a greater flow rate.

[0072] It is clear that different number of fissures can be arranged, from one, to determine an intermediate position between maximum openness and total closure, to an undetermined number, although two intermediate positions seems more than enough due to the length of the cap or plug (700) with respect to the lid (100). By means of these restraint means it is possible to achieve the comfort desired by the user while drinking since they can graduatue the suction effort according to their needs.

[0073] Said restraint means, in their fully closed position, also contribute to increase the tightness between the lid (100) and the cap or plug (700), and hence to ensure asepsis and cleanliness of the contents of the recipient (60) in which the lid with cap object of the present invention is placed.

[0074] The components of the aforementioned restraint means could be inverted with respect to what has been detailed above, i.e., the fissure in the coaxial wall (130) of the lid (100) and the projection on the tubular body (760) of the cap or plug (700). Likewise, said restraint means may be different or include additional elements, such as for example snap rings incorporated into fissures made in the tubular body of the cap or plug that will fit in other fissures made on the coaxial wall of the lid.

[0075] By means of the present invention are achieved the objectives for which it was designed, i.e. achieving simultaneous opening and closing of the liquid outlet and air inlet for improved ergonomics of swallowing, ensuring the asepsis of the contents of the recipient or receptacle, and preventing blockage of the air inlet when the lid is being used for drinking by the user.

1. A lid (100) with cap (700) for drinks receptacle (60) formed by a top surface (120) and a perimeter wall (22), which can be adjusted to an opening of a receptacle (60), with at least one hole for the exit of liquid (170) from the receptacle (60) and at least one hole for the entrance of air into the receptacle (60), characterized in that it comprises:
   a. a valve (310) for the entrance of air (A) located in the air inlet to allow the entrance of air (300) and built into the lid (100) forming a single part, and
   b. a cap or plug or plug element (700) to plug or close the previous holes (170, 300), which is axially movable on said holes (170, 300), allowing the simultaneous opening and closure of both holes.

2. Lid according to claim 1, characterized in that it comprises a coaxial wall (130) that surrounds the liquid outlet (170) and a guiding element (110) of the plug element (700) with respect to which said plug element (700) moves axially.

3. Lid, according to claim 2, characterized in that the guiding element (110) is kept coaxial or centred with respect to the liquid outlet (170) by the action of at least three ribs (140) extending from the bottom part of the top surface (120) of the lid (100) to the bottom end (160) of the guiding element (110).
4. Lid according to claim 1, characterized in that the plug element (700) has a surface (730) that extends to cover the air inlet (300).

5. Lid, according to claim 4, characterized in that the surface (730) of the plug element (700) that extends over the air inlet (300), comprises a bottom projection (720) intended to plug said air inlet (300).

6. Lid, according to claim 1, characterized in that the plug element (700) comprises a tubular body (760), coaxial with the liquid outlet (170) and inserted in it, the outer surface of the tubular body (760) of the plug element (700) being in contact with the inner surface (150) of the coaxial wall (130) that surrounds the liquid outlet (170).

7. Lid according to claim 1, characterized in that said valve (310) comprises a tubular body with two ends, such that a first end is located in the air inlet (300) with its walls surrounding it, and the second end, opposite to the first end, has contacting walls closing the tubular body when at rest or when exerting external pressure on the receptacle and its walls are separated opening the tubular body when in use or when creating depression inside the receptacle.

8. Lid, according to claim 7, characterized in that the tubular body (760) of the plug element (700) extends towards the inside of the receptacle.

9. Lid according to claim 1, characterized in that it comprises coupling means for coupling to said receptacle (60) forming a single part.

10. Lid, according to claim 9, characterized in that said coupling means are a threading (21) located in the perimeter wall of the lid (100) for fixing it to the receptacle (60).

11. Lid, according to claim 9, characterized in that said coupling means are a bayonet, retention, welding, gluing or other physical or chemical anchoring system for its fixation to the receptacle.

12. Lid, according to claim 1, characterized in that the plug element (700) has a surface which slides until plugging the hole that supplies the liquid, clogging said output of liquid.

13. Lid, according to claim 6, characterized in that between the coaxial wall (130) of the lid (100) and the tubular body (760) of the plug element (700) there are arranged restraint means.

14. Lid, according to claim 13, characterized in that said restraint means comprise at least one fissure (765) and a projection (135) intended to be housed at said at least one fissure (765).

15. Lid, according to claim 14, characterized in that at least one fissure (765) is located at the outer wall of the tubular body (760) of the plug element (700) and the projection is located at the coaxial wall (130) of the lid (100).