Aseptic closing cap for liquid containers

An aseptic closing cap for liquid containers comprising a main body (11), provided with a threaded ring, to be associated with a neck of a container (12), from which a tubular projection (13) extends coupled with an upper cap (14), in which a step extends from an inner wall (20) of the projection (13) defining a through hole (21) that is controlled by a flow control element (23), towards the top of side walls of which at least one opening (24) for the liquid to pass through is formed, the flow control element (23) being monolithic and coaxial with respect to the upper cap (14), which has a tubular structure and is able to slide axially along the projection (13) from a raised position, closing off the through hole (21) by the sealing of the flow control element (23) against the wall (20), to a lowered position opening up the hole (21) for the liquid to pass through, elastic elements (32) being arranged between the main body (11) and the upper cap (14) that at rest keep the upper cap (14) in raised closed position.
Description

[0001] The present invention refers to an aseptic closing cap for liquid containers.

[0002] In the field of containers for drinks there is the need to make aseptic caps that, whilst achieving good closing and reclosing seals, make it possible to withdraw part of the liquid contained therein.

[0003] For such a purpose, for example, the aseptic cap object of the patent EP 1065150 is known, which foresee a flow control element which must be moved from a lowered closed position to a raised open position. In such a cap the flow control element is like a cylindrical mushroom that can be moved between the aforementioned positions either by pulling by hand or by the user gripping it with his teeth.

[0004] A cap of this type, however, has some drawbacks which can firstly be identified by the need of its movement both in the open position and in the closing or reclosing position. In such a way it is possible for the container to be accidentally left open and for the liquid or the liquid drink to come out. It is even possible for it to not be completely reclosed and for the drink, if added with carbon dioxide, to lose such a gas and its taste to degrade with respect to the initial one.

[0005] Secondly, especially in the case in which the flow control element is held with the teeth, there is the possibility that it is removed from the tubular projection on which it is slidingly arranged and is swallowed by the user leading to the risk of suffocation.

[0006] Moreover, in these types of caps a covering capsule is foreseen that covers the flow control group and protects it from possible deposited substances or dusts since that is the part which is placed in the mouth of the user.

[0007] The purpose of the present invention is that of avoiding the aforementioned drawbacks and in particular that of devising an aseptic cap that is always perfectly closed, once the user has drunk the desired amount of drink.

[0008] Another purpose of the present invention is that of making an aseptic cap that keeps an optimal seal so as to prevent gas, that has been added to the drink contained in the container equipped with such a cap, from coming out.

[0009] A further purpose of the present invention is that of making an aseptic cap that in any case avoids the removal, even accidental, of the flow control element, thus avoiding its possible swallowing by the user and his suffocation.

[0010] These and other purposes according to the present invention are achieved by making an aseptic cap as outlined in claim 1.

[0011] Further characteristics of the device are object of the dependent claims.

[0012] The characteristics and the advantages of an aseptic cap according to the present invention shall become clearer from the following description, given as an example and not for limiting purposes, with reference to the attached schematic drawings, in which:

- figure 1 is a side elevational view, half-sectioned, of an aseptic cap according to the invention in the closed position, without the protective covering capsule;
- figure 2 is a perspective view from below, partially in section of the cap shown in figure 1;
- figure 3 is a further perspective view from above of the cap of figure 1, provided with a covering capsule;
- figure 4 is a perspective view partially sectioned and exploded of the cap of figure 3;
- figure 5 is a view similar to that of figure 2 showing the cap in its open position; and
- figure 6 is a perspective view from above of a second embodiment of the main body of an aseptic cap according to the invention.

[0013] With reference to the figures, an aseptic closing cap for liquid containers is shown, wholly indicated with reference numeral 10.

[0014] The aseptic cap 10 comprises a main body 11, provided with a threaded ring inside, to be associated with a neck of a container 12, externally threaded in a matching manner. From the main body 11 a tubular projection 13 extends upwards coupled with an upper cap, wholly indicated with reference numeral 14.

[0015] More precisely above the main body 11 an annular plane 15 is foreseen from which an annular shaped portion 16 extends to a second annular plane 17, closing it off, where the tubular projection 13 is arranged. From the annular shaped portion 16, an annular lip 18 extends coaxially outwards, suitable for housing a downward-facing final extension 19 of the upper cap 14.

[0016] The second annular plane 17 extends inside the tubular projection 13 in an inner wall 20 of said projection, generating a step.

[0017] In said inner wall 20 a through hole 21 is formed, provided with a cylindrical peripheral portion 22 facing upwards. Inside the through hole 21 and the cylindrical peripheral portion 22 a flow control element 23 is slidingly arranged, in upward facing side walls of which at least one window shaped opening 24 for the liquid to pass through, is formed.

[0018] The flow control element 23 is monolithic and coaxial to the upper cap 14; moreover, the flow control element 23 has a tubular structure and is able to slide axially inside the through hole 21, i.e. inside the projection 13. In particular, outside the projection 13, in a position at the top end, an annular flap 25 is foreseen, projecting radially outwards, suitable for abutting with a further annular flap 26, projecting radially inwards inside the body of the upper cap 14. These two annular flaps 25 and 26 defining the maximum stroke of the flow control element 23 inside the projection 13. In particular, the flow control element 23 can slide and move from a raised position, in which it closes off said through hole 21 sealing the flow...
The invention is extremely simple and advantageous. The container, to which the cap is applied, with the drink.

To completely sterilize the cap before its use and to fill bridges 37. The presence of this cover makes it possible to position opening up said hole.

Portion 22 that extends above the hole 21, to a lowered position opening up said hole.

The operation of the aseptic cap according to the invention is extremely simple and advantageous.

The cylindrical wall 29 extends in a radially outwards widened portion 30 inside the upper cap 14. In such a way in a position at rest between the upper cap 14 and the annular plane 17 positioned above the main body 11, an annular chamber 31 is defined.

According to the invention it can also be seen that in the annular chamber 31, elastic elements are arranged that at rest keep the upper cap 14 in its raised closed position. In the example shown in figures 1-5, the aforementioned elastic elements are made through a series of tabs or teeth 32 that extend downwards below the widened portion 30 of the upper cap 14. In particular, such tabs 32 are arranged inclined so as to promote their elastic contrasting action with the annular plane 17 of the main body 11.

Alternatively, as shown in figure 6 the tabs or teeth 32 are formed above the annular plane 17 of the main body 11, from which they extend to react this time against the widened portion 30 inside the upper cap 14 in the annular chamber 31.

It can also be seen how the main body 11, once screwed on the neck of the container 12, is fixed there by a tear-away ring 33, connected through breakable bridges 34 to the body 11 itself. The tear-away ring 33 ensures the integrity of the container and of the liquid contained in it. Furthermore, the aseptic cap 10 is sealed before it is opened and before it is used thanks to the presence of a covering capsule 35 that is arranged above the upper cap 14. The covering capsule 35 is fixed to the main body 11, more precisely at the annular lip 18, by a tear-away ring 36 connected to it through breakable bridges 37. The presence of this cover makes it possible to completely sterilize the cap before its use and to fill the container, to which the cap is applied, with the drink.

The operation of the aseptic cap according to the invention is extremely simple and advantageous.

The cylindrical wall 29 extends in a radially outwards widened portion 30 inside, extending in the flow control element 23, has a structure which can be defined as a double tube. More precisely it extends from an upper end plane 28 in a outer cylindrical wall 29, inside which the aforementioned further annular flap 26 is arranged.

The cylindrical wall 29 extends in a radially outwardly widened portion 30 which ends with the final extension 19, also cylindrically shaped. In such a way in a position at rest between the upper cap 14 and the annular plane 17 positioned above the main body 11, an annular chamber 31 is defined.

According to the invention it can also be seen that in the annular chamber 31, elastic elements are arranged that at rest keep the upper cap 14 in its raised closed position. In the example shown in figures 1-5, the aforementioned elastic elements are made through a series of tabs or teeth 32 that extend downwards below the widened portion 30 of the upper cap 14. In particular, such tabs 32 are arranged inclined so as to promote their elastic contrasting action with the annular plane 17 of the main body 11.

Alternatively, as shown in figure 6 the tabs or teeth 32 are formed above the annular plane 17 of the main body 11, from which they extend to react this time against the widened portion 30 inside the upper cap 14 in the annular chamber 31.

It can also be seen how the main body 11, once screwed on the neck of the container 12, is fixed there by a tear-away ring 33, connected through breakable bridges 34 to the body 11 itself. The tear-away ring 33 ensures the integrity of the container and of the liquid contained in it. Furthermore, the aseptic cap 10 is sealed before it is opened and before it is used thanks to the presence of a covering capsule 35 that is arranged above the upper cap 14. The covering capsule 35 is fixed to the main body 11, more precisely at the annular lip 18, by a tear-away ring 36 connected to it through breakable bridges 37. The presence of this cover makes it possible to completely sterilize the cap before its use and to fill the container, to which the cap is applied, with the drink.

The operation of the aseptic cap according to the invention is extremely simple and advantageous.

As soon as the user eliminates the pressure on the upper cap 14 the tabs 32, compressed, tend to return to the resting position, raising the upper cap 14. This raising causes the flow control element 23 to slide inside the through hole 21 to completely sealingly close it.

From what has just been seen it should be clear that there is no way for the upper cap 14 to be swallowed accidentally by the user since it is not pulled, but instead compressed during ingestion of the drink. Moreover, the upper cap cannot in any case be removed from the main body 11 thanks to the presence both of the mutually abutting annular flaps 26 and 25 and the engagement between the sealing portions of the flow control element 23 and the cylindrical peripheral portion 22.

The presence of the elastic elements in the form of tabs 32 also achieves a closure or automatic reclosure of the aseptic cap as soon as there is no longer the pressing on the upper cap 14.

From the description made, the characteristics of the aseptic cap object of the present invention are clear, as the relative advantages are also clear.

Finally, it should be clear that the aseptic cap thus conceived can undergo numerous modifications and variants, all covered by the invention; moreover, all the details can be replaced by technically equivalent elements. In practice the materials used, as well as the sizes, can be any according to the technical requirements.

Claims

1. Aseptic closing cap for liquid containers comprising a main body (11), provided with a threaded ring, to be associated with a neck of a container (12), from which a tubular projection (13) extends coupled with an upper cap (14), in which a step extends from an inner wall (20) of said projection (13) defining a through hole (21) that is controlled by a flow control element or shutter (23), towards the top of side walls of which at least one opening (24) for the liquid to pass through is formed, said flow control element (23) being monolithic and coaxial with respect to said
upper cap (14), which has a tubular structure and is able to slide axially along said projection (13) from a raised position, closing off said through hole (21) by the sealing of said flow control element (23) against said wall (20), to a lowered position opening up said hole (21) for the liquid to pass through, elastic elements (32) being arranged between said main body (11) and said upper cap (14) that at rest keep said upper cap (14) in raised closed position.

2. Aseptic closing cap according to claim 1, characterised in that said elastic elements are tabs or teeth (32) that extend either from said main body (11) or from said upper cap (14).

3. Aseptic closing cap according to claim 1, characterised in that at said through hole (21) a cylindrical peripheral portion (22) is foreseen that extends upwards and that is equipped with an end (22a) towards the inside.

4. Aseptic closing cap according to claim 1, characterised in that said flow control element (23) foresees an end (23a) that is widened towards the outside.

5. Aseptic closing cap according to claim 1, characterised in that said main body (11) foresees an annular plane (15) from which an annular lip (18) extends upwards to define a housing for a downward-facing final extension (19) of the upper cap (14).

6. Aseptic closing cap according to claim 1, characterised in that an annular flap (25) is foreseen formed at an end of said tubular projection (13) and facing outwards and an annular flap (26) is foreseen projecting radially inwards in an outer cylindrical wall (29) of said upper cap (14).
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The present search report has been drawn up for all claims.

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**Date of completion of the search:** 22 September 2010  
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ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex: see Official Journal of the European Patent Office, No. 12/82
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