A plastic tamper-evident screw closure is disclosed for containers and bottles. An exemplary tamper-evident screw closure includes a screw cap, which has a cylindrical jacket with an internal thread, and an annular tamper-evident strip which is connected to a free edge of the jacket by breaking webs or the like and is equipped with locking elements. The tamper-evident strip can have a smaller outside diameter than the jacket of the screw cap. The locking elements can be configured as undercut regions in the tamper-evident strip which in each case run between two adjacent breaking webs as a ring segment, and extend from a cylindrical inner wall to an outer wall of the tamper-evident strip.
TAMPER-EVIDENT SCREW CLOSURE FOR CONTAINERS AND BOTTLES, ESPECIALLY FOR PLASTIC BOTTLES

[0001] The invention relates to a tamper-evident screw closure for containers and bottles, especially for plastic bottles, as claimed in the preamble of claim 1.

[0002] The metal caps which were used in the past for closing of containers and bottles, so-called crown corks, for removal of which a separate tool was necessary, are being increasingly replaced by plastic screw closures. These plastic closures are generally produced in an injection molding process or in a diecasting process. Generally the plastic closures are made as so-called tamper-evident screw closures. For this purpose the actual screw cap of the closure is connected to a ring-shaped, tamper-evident strip which is connected to the free edge of the jacket of the screw cap by breakaway webs. Intactness of the connection of the tamper-evident strip to the screw cap is designed to indicate that the closure has not been opened since the container or bottle was filled and sealed.

[0003] In the known version of tamper-evident screw closures, projections protrude from the inside wall of the ring-shaped tamper-evident strip and by a blocking interaction with the corresponding profiling on the wall of the neck of the bottle they provide for the tamper-evident strip not being able to follow the rotary motion of the closure cap when the tamper-evident screw closure is unscrewed, but the breakaway sites are sheared off. Generally, on the neck of the bottle there is additionally a peripheral flange which prevents the tamper-evident strip which has been separated from the screw cap from falling off the neck of the bottle. When the tamper-evident screw closure is unscrewed, the peripheral flange generally to a certain extent also provides for the tamper-evident strip not being able to follow the axial motion of the screw cap and the breakaway sites being additionally broken open by the tensile loading between the screw cap and the tamper-evident strip.

[0004] In known tamper-evident screw closures, the projections protruding from the inside wall of the tamper-evident strip are generally made wedge-shaped in the closing direction of rotation. This is designed to facilitate the tamper-evident screw closure being screwed on. For reasons of production engineering, the protrusion of the projections over the inside wall of the tamper-evident strip is however only relatively small. On the other hand, the tamper-evident strip must be made relatively narrow so that the projections protruding to the inside engage the corresponding projections on the wall of the neck of the bottle. For reasons of construction, this results in a relatively great screw-on force which must be applied so that when the tamper-evident screw closure is screwed for the first time onto a container or bottle the tamper-evident strip can be pressed with the protruding projections over the peripheral flange. So that the breakaway webs do not break when the tamper-evident screw closure is screwed on for the first time, they must be made relatively stable. This results in turn in a comparatively large unscrewing force which must be applied so that when the tamper-evident screw closure is unscrewed, the tamper-evident strip is separated from the screw cap.

[0005] It can happen that when the tamper-evident screw closure is unscrewed the breakaway webs are only partially broken or not at all. When the breakaway webs are only partially broken off it is necessary to pull repeatedly at the screw cap until the tamper-evident strip completely detaches. Then the tamper-evident strip often runs in part above the flange which runs peripherally on the neck of the bottle; this is an obstacle when the screw cap is being screwed on again to close the container or bottle. If the tamper-evident strip does not detach completely from the screw cap, for larger dimensional tolerances of the neck it can happen that the entire tamper-evident screw closure is unscrewed intact. In this case the tamper-evident screw closure fails completely with respect to its function of indicating intactness, and the impression can be engendered in the consumer that the contents of the container or bottle could have been tampered with. In many known tamper-evident screw closures, after unscrewing the screw cap and screwing it back onto the container or bottle again it is not directly apparent that the container or bottle has already been opened once and the tamper-evident strip has already been separated. For the consumer this can lead to confusion which should be avoided.

[0006] EP-A-0 916 587 discloses a tamper-evident screw closure with a tamper-evident strip which has an internal edge bead and tabs which project radially to the inside. The tabs are coupled to the internal edge bead via an articulated bending region with a thinner cross section. U.S. Pat. No. 4,748,735 discloses a similar tamper-evident screw closure with a tamper-evident strip which has tabs bent to the inside in the manner of fish hooks. Published U.S. patent application No. 2001/0015341 discloses a tamper-evident screw closure with a tamper-evident strip which is connected to the jacket edge of the closure via webs which are provided with scoring. Between the webs there are window-like openings in which there are wings which are bent to the inside in the manner of a pivot-hung window. The wings are coupled on the lower edge of the tamper-evident strip. The tamper-evident screw closure described in GB-A-2 269 372 has a tamper-evident strip which is connected to the jacket of the screw closure via ribs provided with scoring. Between the relatively stable ribs there are blocking bodies which are made wedge-shaped projecting radially to the inside from the lower edge of the tamper-evident ring. Material tapering which runs in the peripheral direction forms bending joints in the manner of light hinges for the wedge-shaped blocking bodies so that they can slide over an annular bead which runs peripherally on the bottle when the tamper-evident screw closure is pressed on. The closure for milk bottles which is described in WO 97/35773 is not an actual screw closure. Rather it is a snap closure which can be unscrewed by turning. The snap closure has two locking systems which are matched to a specially made bottle neck. There is also a tamper-evident ring which is connected to the closure cap via thin joining webs which can be broken off. From the tamper-evident ring locking clips project radially to the inside and engage special recesses on the periphery of the neck of the bottle when the snap closure is put into place. Window-like recesses on the tamper-evident ring are intended to ensure the elasticity of the locking clips.

[0007] U.S. Pat. No. 6,325,227 B1 which forms the most similar prior art discloses a tamper-evident screw closure for bottles with a flange which runs peripherally in a ring shape on the neck of the bottle which has a screw cap and a tamper-evident strip which is molded on in one piece. The screw cap has a cylindrical jacket. The ring-shaped tamper-evident strip is provided with window-like recesses which extend between relative solid webs. In the contact region between the webs and the free lower edge of the jacket of the screw cap there are breakaway webs. In the region of the window-like recesses

May 14, 2009
locking cams which are made wedge shaped extend radially to the inside. The window-like recesses are formed in the production of the screw closure from laterally and radially movable slides which are delivered to the injection mold to form the wedge-shaped locking cams.

[0008] The structure and the production of the tamper-evident screw closures known from the prior art are relatively complex and expensive and dictate special injection tools with laterally and radially movable slides and the like. The more complex structure of the molding tool results in elevated tool costs. Due to the required mechanical movements of the additional tool parts the cycle speeds for producing the tamper-evident rotary closures are relatively low. Due to the larger number of moving parts the injection tools do not have the desired long service lives either and are more susceptible to being repaired.

[0009] The object of this invention is therefore to remedy these disadvantages of the tamper-evident screw closures of the prior art. A plastic tamper-evident screw closure for containers and bottles, especially for plastic bottles, will be devised with a tamper-evident strip which can be reliably separated from the screw cap during unscrewing without unduly great expenditure of force. Dimensional fluctuations of the neck of the container or bottle and lack of roundness of the neck are to be equalized. Mounting of the tamper-evident screw closure will be easily possible without increased pressing or twisting forces. The tamper-evident screw closure is designed to enable the consumer to more easily and reliably visually recognize intactness. It is intended to be able to be produced in a tool which is as simple and cost-favorable as possible in an injection molding process or in a diecasting process. The service lives of the tools are to be higher than in machines for producing the known tamper-evident screw closures. In the production of the tamper-evident screw closure it is to be possible to save material without in this way adversely affecting functionality and reliability.

[0010] These objects are achieved in a plastic tamper-evident screw closure for containers and bottles, especially for plastic bottles, which has the features listed in the characterizing section of claim 1. Developments and/or advantageous versions of the invention are the subject matter of the dependent claims.

[0011] The invention devises a plastic tamper-evident screw closure for containers and bottles, especially plastic bottles, consisting of a screw cap which has a cylindrical jacket with an internal thread, and a ring-shaped tamper-evident strip which is connected via breakaway webs or the like to the free edge of the jacket and is equipped with locking elements which are made for positive engagement with an abutment which is made on the neck of the container or bottle. The tamper-evident strip has an outside diameter which is smaller than that of the jacket of the screw cap. The locking elements are formed by bevelled undercut regions of the tamper-evident strip which each run in the manner of a ring segment between two adjacent breakaway webs and which extend from the axially longer cylindrical inside wall to the axially shorter outside wall of the tamper-evident strip.

[0012] The locking elements are made for positive interaction with a peripherally running snap flange provided on the neck of the container or bottle and extend in the axial direction perpendicular to the unscrewing direction of the tamper-evident screw closure. To distinguish them from blocking elements made in the manner of a wing or tab, they extend in the peripheral direction between two adjacent breakaway webs. When the tamper-evident screw closure is being unscrewed, the inside wall of an undercut region which has been beveled at an acute angle nearer the wall of the neck runs first against the bottom of the flange. As turning continues in the direction of opening, the pressure on the inside wall of the undercut region increases and positive locking is increased. The execution of the locking elements as claimed in the invention can equalize larger fluctuations of dimensions of the neck of the container or bottle and lack of roundness. As unscrewing continues, the forces on the breakaway webs increase and they always break off completely in the same quality. The forces acting on the breakaway webs are first of all tensile forces which are superimposed to a certain extent by shearing forces. Since there is no positive connection of the tamper-evident strip toward the wall of the neck and the tamper-evident strip when the tamper-evident screw closure is unscrewed does not experience friction on the neck, the unscrewing forces are relatively small. The screw-on forces or press-on forces are comparatively small, since only towards the end of the mounting process do the ring segment-like undercut regions of the tamper-evident strip come into contact with the peripherally running snap flange on the neck of the container or bottle. Then the tamper-evident ring is stretched slightly in the radial direction beyond the undercut regions and finally will slide behind the snap flange. Due to the relatively small screw-on or press-on forces the breakaway webs need not be especially strong. This is expressed in turn in reduced unscrewing forces. The strength of the breakaway webs must be so great that they are not damaged upon removal from the mold and when the closure is applied or pressed onto the bottle neck. By the tamper-evident strip having a smaller outside diameter than the screw cap, in the mounted state of the tamper-evident screw closure its undercut regions are located as near as possible to the periphery of the neck without in doing so rubbing against it in the unscrewing motion. Due to the lower material use on the tamper-evident strip on the one hand there is sufficient elasticity in mold removal and when the bottle is closed, on the other hand, the functionality of the tamper-evident screw closure is ensured. Moreover material can be saved by this measure.

[0013] Due to its only relatively small undercuts, due to the relatively elastic execution of its tamper-evident ring and due to the execution of its locking element, the tamper-evident screw closure made as claimed in the invention can be produced with relatively simple tools for example in an injection molding process or in a diecasting process. Movable slides or similar movable mold parts can be omitted in the molding tool. In this way the tool is mechanically less strongly loaded and it has a longer service life. Due to the lack of additional movable mold parts, faster production cycles can be achieved. The simpler execution of the tool directly benefits the tool costs.

[0014] The tamper-evident strip must have a certain strength and must still be elastic enough to be able to be radially widened when installed on the neck of the container or bottle until the undercut regions slide over the snap flange. For this purpose it is advantageous for the tamper-evident strip that the wall thickness be roughly 40 to roughly 90% of the wall thickness of the cylindrical jacket of the screw cap in a thread-free region.

[0015] To equalize dimensional tolerances and lack of roundness of the neck of a container or a flange, it is advantageous if the bevelled undercut region of the wall of the
tamper-evident strip has an axial length which is \( \frac{1}{5} \) to \( \frac{2}{5} \) of the axial length of the breakaway webs.

[0016] For reasons of production engineering and in order to ensure a buildup of pressure on the tamper-evident ring as rapidly and greatly as possible when the tamper-evident screw closure is being unscrewed, it is advantageous if the undercut region with the inside wall of the tamper-evident strip forms a largely sharp-edged transition.

[0017] The snap flange which runs peripherally on the neck of the container or bottle is visible to the consumer when the tamper-evident screw closure has been mounted. So that still better visibility is ensured and in order to make it recognizable when the screw cap has been screwed back on after opening for the first time that the tamper-evident screw closure has already been opened once, the breakaway webs have an axial length which is 50% to 100% of the axial length of the outside wall of the tamper-evident strip adjoining the undercut region. The length of the breakaway webs is such that the annular gap interrupted by the breakaway webs between the screw cap and the tamper-evident strip has a width from roughly 0.5 mm to roughly 5 mm. For still better detection of interrupted connections between the tamper-evident strip and the screw cap it has proven feasible for the separated tamper-evident strip on the neck of the container or bottle to be able to drop a few millimeters.

[0018] The inside diameter measured on the undercut regions of the tamper-evident strip is feasibly larger than the inside diameter of the screw cap on the internal thread sections. This ensures that the tamper-evident strip can slide without obstruction over the outside thread on the neck of the bottle when the tamper-evident screw closure is mounted and tilting of the tamper-evident screw closure is prevented.

[0019] In order to be able to preclude manipulation of the tamper-evident screw closure with high reliability, the locking elements must have a certain stiffness. This is ensured especially also by their ring segment-shaped extension in the peripheral direction. In this connection it is advantageous if the undercut regions which run in the manner of a ring segment between the breakaway webs have a peripheral extension which corresponds to 60% to 100% of the distance measured in the peripheral direction between two adjacent lengthwise edges of two adjacent breakaway webs.

[0020] Containers or plastic bottles which are equipped with a tamper-evident screw closure made as claimed in the invention are characterized in handling of the closure by the advantages described using the various versions of the tamper-evident screw closure. One especially advantageous version calls for the region of the neck of the container or bottle in which the tamper-evident strip is located when the tamper-evident screw closure has been screwed on to have a longer axial extension than that of the tamper-evident strip. In this way the tamper-evident strip which has been separated the first time the tamper-evident screw closure is unscrewed can slide down somewhat on the neck. With the screw cap screwed on again, it is thus immediately apparent to the consumer that the tamper-evident screw closure has already been opened once.

[0021] Other advantages and features will become apparent from the following description of embodiments of the invention with reference to the schematic drawings. The figures are not to scale.

[0022] FIGS. 1 and 2 show a side view and a top view of a tamper-evident screw closure of the prior art;

[0023] FIG. 3 shows a section of the tamper-evident screw closure which has been screwed onto the neck of a container or bottle according to cutting line D-D in FIG. 2;

[0024] FIG. 4 shows a detail of the section from FIG. 3;

[0025] FIG. 5 shows a side view of a tamper-evident screw closure as claimed in the invention;

[0026] FIG. 6 shows a section of the tamper-evident screw closure as shown in FIG. 5;

[0027] FIG. 7 shows a section of the tamper-evident screw closure as shown in FIG. 5 in the screw-on position;

[0028] FIG. 8 shows a detail of the section from FIG. 7;

[0029] FIG. 9 shows a section of the tamper-evident screw closure as shown in FIG. 5 in the screwed-on state;

[0030] FIG. 10 shows a detail of the section from FIG. 9;

[0031] FIG. 11 shows a section of the tamper-evident screw closure as shown in FIG. 5 in the state briefly before the breakaway webs break off; and

[0032] FIG. 12 shows a detail of the section on FIG. 11.

[0033] The tamper-evident screw closure of the prior art which is shown in FIGS. 1-4 in different views and sections is labelled with reference number 101 overall. The figures show the tamper-evident screw closure 101 in the state screwed onto the neck of a container or bottle, the container being labelled 120. The tamper-evident screw closure 101 consists of a screw cap 102 with a jacket 103 and a tamper-evident strip 104 which is connected via the breakaway webs 105 to the screw cap 102. In the illustrated tamper-evident screw closure 101 of the prior art, the tamper-evident strip 103 has the same outside diameter as the jacket 103 of the screw cap 102. Tamper-evident closures are also known in which the tamper-evident strip has a greater outside diameter than the screw cap. The screw cap 102 and the tamper-evident strip 104 are produced in one piece in a plastic injection molding process or in a plastic die casting process. The jacket 103 of the screw cap 102 is provided on its outside with fluting or with axially running grooves 106 or the like which facilitate gripping and holding of the tamper-evident strip 101.

[0034] In the axially cut FIG. 3, again 101 labels the tamper-evident screw closure with the screw cap 102 and the tamper-evident strip 104. The jacket of the screw cap 102 is labelled with reference number 103. On the edge of the jacket 103 which runs annularly the breakaway web is labelled with reference number 105. The container or the bottle 120 has a neck which is provided with reference number 121. External thread sections 122 on the neck 121 of the container or bottle engage the internal thread sections 107 of the jacket 103 of the screw cap 102. The neck 121 of the container or bottle is provided with projections 123 which interact with the corresponding profiling 108 which is made on the inside wall 109 of the tamper-evident strip 104 (FIG. 4).

[0035] FIG. 4 shows the section surrounded by the broken line in FIG. 3 on a larger scale. It shows that the profiling 108 of the inside wall 109 of the jacket 103 is made for example as lengthwise grooves or axial strips which are engaged by the projections 123 which are located in a ring shape on the neck 121 of the container or bottle. The projections 123 and profiling 108 form a rotary lock which becomes active when the tamper-evident screw closure 101 is unscrewed from the neck 121 of the container or bottle. The lock prevents the tamper-evident strip 104 from turning concomitantly with the screw cap 102 and the breakaway webs 105 are finally sheared off upon further unscrewing. On the inside wall 109 of the tamper-evident strip 104 there is a peripheral annular bead 110 which prevents the separated tamper-evident strip 104
from dropping off the neck 121 of the container and bottle. The annular bead 110 extends behind the projections 123 on the neck 121 of the container or bottle 121 and when the tamper-evident screw closure 101 is unscrewed supports the breaking of the breakaway webs 105 by its preventing the tamper-evident strip 104 from following the axial lifting motion of the screw cap 102.

[0036] The tamper-evident screw closure as claimed in the invention which is shown in FIGS. 5 and 6 is labelled overall with reference number 1. It comprises a screw cap 2 with a cylindrical jacket 3 and a tamper-evident strip 4 which is connected via breakaway webs 2 to the free edge of the jacket 3 of the screw cap 2. The outside surface of the jacket 3 is provided with fluting or with lengthwise ribs 6 or the like in order to facilitate gripping and holding of the tamper-evident screw closure when screwing onto or off of the neck of a container or bottle. The tamper-evident strip 4 has an outside diameter which is smaller than the outside diameter of the jacket 3 of the screw cap 2. As is apparent from FIGS. 5 and 6, on the tamper-evident strip 4 locking elements are formed which have the shape of bevelled undercut regions 8. The undercut regions 8 have an axial length t which is roughly \( \frac{1}{2} \) to \( \frac{3}{2} \) of the axial length s of the breakaway webs 5. They each extend between two adjacent breakaway webs 5. The length of the breakaway webs 5 is especially such that an annular gap 9 between the screw cap 2 and the tamper-evident strip 4 which is interrupted in the peripheral direction by the breakaway webs 5 has a width which is roughly 0.5 to roughly 5 mm. The width of the ring segment-like undercut regions 8 measured in the peripheral direction is roughly 60% to roughly 100% of the distance measured in the peripheral direction between two adjacent lengthwise edges of two adjacent breakaway webs.

[0037] FIGS. 7 and 8 and FIGS. 9 and 10 and FIGS. 11 and 12 show the tamper-evident screw closure in three different stages of screwing on and off with the pertinent detail of the area surrounded by the broken line. The container or bottle is indicated by reference number 20. The neck of the bottle or container is labelled with reference number 21.

[0038] FIGS. 7 and 8 show the tamper-evident screw closure 1 which is mounted for the first time on the neck 21 of the bottle. In particular the state is shown in which the tamper-evident strip 4 which has a smaller outside diameter than the jacket 3 of the screw cap 2 is pressed over a snap flange 23 which is used as the abutment for the ring segment-like undercut regions 8. Here the tamper-evident strip 4 is elastically widened. Elasticity is ensured by the material, the smaller outside diameter of the tamper-evident strip 4, and by the wall thickness of the tamper-evident strip 4 which is less compared to the relatively rigid screw cap 2. In this connection the tamper-evident strip 4 has a wall thickness b which is roughly 40% to 80% of the wall thickness a of the screw cap 2 in the region of its jacket (FIG. 10). When mounted for the first time, the tamper-evident screw closure 1 is pressed on or screwed on. The neck 21 of the container or bottle is provided with sections 22 of the external thread which engage the sections 7 of the internal thread on the screw cap 2.

[0039] In FIGS. 9 and 10 the tamper-evident screw closure 1 is mounted entirely on the neck 21 of the container or bottle. The tamper-evident strip 4 and the breakaway webs 5 are intact and run in the immediate vicinity to the neck 21 of the container or bottle. FIG. 9 clearly shows that the tamper-evident strip 4 has a smaller outside diameter than the jacket 3 of the screw cover 2. The ring segment-like undercut regions 8 of the tamper-evident strip 4 extend behind the snap bead 23 which runs peripherally on the neck 21 of the container or bottle. The detailed representation in FIG. 9 shows that the ring segment-like undercut regions 8 extend from an axially longer inside wall 42 to an axially shorter outside wall 41 of the tamper-evident strip 4. The breakaway webs 5 have an axial length which is 50% to 100% of the axial length of the outside wall 41 of the tamper-evident strip 4 which adjoins the undercut region 8. It is likewise apparent that the region of the neck 21 of the container or bottle in the immediate vicinity of the tamper-evident strip 4 has a greater axial extension than the tamper-evident strip. In this way the tamper-evident strip 4 which has been separated from the screw cap 2 when unscrewed can slide down a few millimeters on the neck 21 of the container or bottle.

[0040] FIG. 11 and the detail in FIG. 12 finally show the tamper-evident screw closure 1 when unscrewed from the neck 21 of the container or bottle. The undercut regions 8 which form a largely sharp-edged transition with the inside wall 42 of the tamper-evident strip 4 positively adjoin the bottom of the snap bead 23. The tamper-evident strip 4 is slightly widened by the tensile forces and by the bevel of the undercut regions 8 and is tilted to the outside. As the tamper-evident screw closure 1 continues to be unscrewed, the tensile forces acting on the tamper-evident strip 4 and the breakaway webs 5 increase. This is indicated in FIG. 12 by the necking of the illustrated breakaway web 5. The tamper-evident strip 4 is tilted still further to the outside and the positive locking of the undercut regions 8 with the snap bead 23 is increased. A further increase of the tensile forces finally leads to breaking of the connection of the breakaway webs 5 to the jacket 3 of the screw cap 2. In this way the tamper-evident strip 4 is separated from the screw cap 2 and it can slide down on the neck 21 of the container or bottle. The snap bead 23 prevents the tamper-evident strip 4 from being lost. If the screw cap 2 is again screwed onto the neck 21 of the container or bottle, it is immediately apparent that the tamper-evident screw closure 1 has already been opened.

[0041] The tamper-evident screw closure as claimed in the invention consists of plastic and can be produced for example in an injection molding process or in a diecasting process. Due to the simplicity of its construction it can be produced with relatively simple tools which have a smaller number of movable components. This results in longer service lives and faster cycle times. The construction of the tamper-evident screw closure allows the consumer to ascertain directly and unmistakably whether the tamper-evident screw closure has already been opened once. The tamper-evident screw closure has been explained on the example of a screw cap and a tamper-evident strip with a circular cross section. It goes without saying that the cross section of the screw cap can also be made polygonal or elliptical or egg-shaped or the like. The applies analogously to the outside contour of the tamper-evident strip as well. The screw cap can also have a double jacket. In this connection the execution as claimed in the invention is referenced to the inside jacket.

1. Tamper-evident screw closure of plastic comprising:
a screw cap which has a cylindrical jacket with an internal thread;
a ring-shaped tamper-evident strip which is connected via breakaway webs or the like to a free edge of the jacket; and
locking elements configured for positive engagement with an abutment of a container or bottle,
wherein the tamper-evident strip has an outside diameter which is smaller than that of the jacket of the screw cap and wherein the locking elements are formed by bevelled undercut regions of the tamper-evident strip which each run as a ring segment between two adjacent breakaway webs and which extend from an axially longer cylindrical inside wall to an axially shorter outside wall of the tamper-evident strip.

2. Tamper-evident screw closure as claimed in claim 1, wherein the tamper-evident strip has a wall thickness which is 40% to 80% of the wall thickness of the cylindrical jacket of the screw cap in a thread-free region.

3. Tamper-evident screw closure as claimed in claim 1, wherein each beveled undercut region of the tamper-evident strip has an axial length which is \(\frac{1}{3}\) to \(\frac{2}{3}\) of an axial length of the breakaway webs.

4. Tamper-evident screw closure as claimed in claim 1, wherein each undercut region with the inside wall of the tamper-evident strip forms a largely sharp-edged transition.

5. Tamper-evident screw closure as claimed in claim 1, wherein the breakaway webs have an axial length which is 50% to 100% of an axial length of the outside wall of the tamper-evident strip adjoining the undercut regions.

6. Tamper-evident screw closure as claimed in claim 1, wherein an axial length of the breakaway webs is such that an annular gap between the screw cap and the tamper-evident strip has a width from roughly 0.5 mm to roughly 5 mm.

7. Tamper-evident screw closure as claimed in claim 1, wherein an inside diameter of the tamper-evident strip measured over the undercut regions is larger than an inside diameter of the screw cap measured over on the internal thread sections.

8. Tamper-evident screw closure as claimed in claim 1, wherein the undercut regions which each run as a ring segment between the breakaway webs have a peripheral extension which corresponds to 60% to 100% of a distance measured in a peripheral direction between two adjacent lengthwise edges of two adjacent breakaway webs.


10. Container as claimed in claim 9, comprising:

11. Tamper-evident screw closure as claimed in claim 2, wherein each beveled undercut region of the tamper-evident strip has an axial length which is \(\frac{1}{3}\) to \(\frac{2}{3}\) of an axial length of the breakaway webs.

12. Tamper-evident screw closure as claimed in claim 11, wherein each undercut region with the inside wall of the tamper-evident strip forms a largely sharp-edged transition.

13. Tamper-evident screw closure as claimed in claim 12, wherein the breakaway webs have an axial length which is 50% to 100% of an axial length of the outside wall of the tamper-evident strip adjoining the undercut regions.

14. Tamper-evident screw closure as claimed in claim 13, wherein the axial length of the breakaway webs is such that an annular gap between the screw cap and the tamper-evident strip has a width from roughly 0.5 mm to roughly 5 mm.

15. Tamper-evident screw closure as claimed in claim 14, wherein an inside diameter of the tamper-evident strip measured over the undercut regions is larger than an inside diameter of the screw cap measured over on the internal thread sections.

16. Tamper-evident screw closure as claimed in claim 15, wherein the undercut regions which each run as a ring segment between the breakaway webs have a peripheral extension which corresponds to 60% to 100% of a distance measured in a peripheral direction between two adjacent lengthwise edges of two adjacent breakaway webs.

17. Container in combination with a tamper-evident screw closure as claimed in claim 16.

18. Container as claimed in claim 17, wherein the container is a plastic bottle.