The invention disclosed herein consists of a screw-thread for bottles with asymmetrical neck, of among the screw-threads which define the exact position of the element to be screwed on: a cap without symmetry, or a spray gun. The invention is conceived so that in all cases it permits the user to introduce the screw-thread at any angle and the end (9.3) of the screw-thread to be reached and therefore its correct position. The use is combined of a single entry screw-thread plus a section (9.2) without helical pitch and a set of projections (10) which increase the pressure and friction of the cylindrical body to be screwed on. This pressure and the greater friction produced are what prevent the unscrewing whilst avoiding the need to overcome the particular force necessary in the solutions habitually employed to surpass anchoring projections (10).
Description

OBJECT OF THE INVENTION

[0001] The invention disclosed hereunder consists of a screw-thread for bottles with asymmetrical neck, of among the screw-threads which define the exact position of the element to be screwed on: a cap without symmetry, or a spray gun. The invention is conceived so that in all cases it facilitates the user reaching the end of the screw-thread and therefore its correct position.

[0002] The invention is characterised in the combined use of single entry screw-thread plus a section without helical pitch and a set of projections which increase the pressure and friction of the cylindrical body to be screwed on.

[0003] This pressure and the greater friction produced are what prevent the unscrewing whilst avoiding the need to overcome the particular force necessary in the solutions habitually employed to surpass anchoring projections.

BACKGROUND OF THE INVENTION

[0004] The use is habitual of asymmetrically necked bottles or flasks, either for aesthetic reasons or because the offset of the axis of the neck of the bottle gives rise to a greater facility of use.

[0005] In the case of bottles, the offsetting of the axis of the neck of the bottle implies that the latter is nearer to one of the faces. A case of major importance is that of the bottles which incorporate a gun for spraying.

[0006] When a bottle of reduced capacity with a spray gun is gripped for spraying a product, the unit is entirely supported by the hand which clasps the spray gun. The trigger is pressed with the fingers and the main support is produced between the thumb and index finger.

[0007] A firm grasp is easier when the centre of gravity of the bottle lies on the vertical line through this point of support, and such a situation is possible precisely when making use of asymmetrical necks which establish the offsetting necessary so that the centre of gravity lies where it is required.

[0008] This solution likewise requires that the spray gun, when screwed onto the bottle, is always positioned as indicated by the offsetting.

[0009] Similar justifications, or of another nature, are applicable to asymmetrical bottles or recipients in which, for aesthetic reasons, it is necessary that the element to be screwed on, once screwed on, is positioned in a predetermined direction.

[0010] The type of screw-threads habitually employed in these asymmetric bottles are based on the use of two differentiated sectors, one with a raised helical pitch for a quick engagement, for example in a quarter turn or less, and another sector with zero pitch which has the projections of the body to be screwed on at a position which assures the union between the two bodies.

[0011] In this position, it is necessary that unscrewing is not easy since the unit is always held by the upper screwed-on element, as is the case of the spray gun, bad fastening will result in the bottle falling. This fall can prove very dangerous when using products such as caustic degreasing agents, bleaches or acids.

[0012] The solutions which are known to avoid easy unscrewing, consist of wedges which facilitate the penetration of projections located on the element to be screwed on and, once screwed on, make the disengagement thereof difficult.

[0013] This type of bottle is very habitual in guns for spraying products for use in the home and which come with refills, and the latter are sold separately. The user, after purchasing the refill is the person that fits the same.

[0014] At the time of screwing on the new container, during the screwing operation it is necessary to surpass the rotation which corresponds to the lead imposed by the presence of a helical sector of positive pitch (and raised as said), the sector with zero pitch, and particularly, the third sector which surpasses the wedge and secures the thread.

[0015] This last sector requires that sufficient pressure be applied to overcome the wedge-shaped surface, however various cases exist, like:

- Not knowing the screw system with its means of securing to prevent unscrewing,

- Not having sufficient strength to surpass the wedging stage,

- The user feels the wedge and believing he has reached the end, does not continue to apply force convinced that otherwise he is forcing the unit,

- The entry of the element to be screwed on is only accepted in various positions, there being others which give rise to false entries which do not lead to secure fastening.

[0016] One of these types of closure is that disclosed in the European Patent with publication number EP867230 in which use is made of a solution like that described and which presents all the problems mentioned with the danger this implies for domestic use.

[0017] In all these cases the two bodies are not secure and can result in the aforementioned accidents.

[0018] The present invention surpasses this state of the art with a solution which prevents false securing of the screw by improving the entry in any position and establishing more secure tightening projections.

DESCRIPTION OF THE INVENTION

[0019] The invention object of the present specification relates to a screw-thread for bottles with asymmetric necks in which the stability of the union is assured with-
out requiring intermediate particular efforts to surpass wedges and in which the entry of the element to be screwed on is not restricted to certain sectors only.

[0020] To achieve this objective, use is made of a combination of a single interrupted thread plus some projections specially designed to achieve the securing by the action of a progressive pressure but sufficient to stabilise the final position of the body to be screwed on with respect to the bottle.

[0021] This progressive pressure does not require particular forces and signifies that in all cases the user always turns the screw to the end intuitively.

[0022] The screw-thread has various entries and is formed by interrupted projections in which principally three sections are distinguished:

1. A helical section of raised helical pitch for quick entry. This section is really the screw-thread which establishes the entry. It is pointed on its end so that the possibility of entry is extended from being only one defined sector to any angle of entry.

2. A section of zero helical pitch which carries the body to be screwed on to the pre-established final position.

3. A vertical section which is precisely that which defines the end of travel.

[0023] With these elements alone, the screwing-on operation has two stages, an initial entry stage with a raised thread pitch, and a second without pitch which includes an angle of rotation which carries the body to be screwed on to the final position.

[0024] During the closing movements, there is no impediment to rotation whatsoever, except that due to the friction between the different surfaces in contact.

[0025] The present invention incorporates additionally some projections distributed between the threaded elements which force a greater degree of friction with the cylindrical body to be screwed on acting progressively during the closing operation. Hereinafter such projections shall be termed pressure projections.

[0026] This increment in friction serves to maintain the element to be screwed on in the final position and offers the benefit of having a progressive force of retention.

[0027] During the entry of the upper body in the screwing-on operation, there are some horizontal rectangular projections internal to the cylindrical body to be screwed on, an example being the cylindrical body firmly attached to a gun for spraying, which establish the support on the thread of the bottle following its interrupted profile.

[0028] The cylindrical body in which these horizontal projections are to be found progressively covers the thread of the bottle. It is in this progressive entry wherein the vertical pressure projections are covered and the force of friction between the two bodies to be screwed together is gradually increased.

[0029] When the thread has been introduced to the end, the pressure projections are fully covered and applying a force which at this point is maximum.

[0030] Additionally, each of the projections which have been distinguished in sections, and which define the thread, have a pointed and rounded entry end.

[0031] In contrast to what would happen in the screw-threads described in the state of the art in which preferably there are entry sectors on the projections of the body to be screwed on, in this invention the entire section defined between pointed ends is valid for entry.

[0032] As the width of the projection is really reduced by its roundness, the repetition over the entire length of the perimeter of this arrangement of projections achieves that in practice any angle of entry whatsoever is valid.

[0033] To this advantage can be added that this pointed projection presents a wedge-shaped vertical gradient which better facilitates the entry in whatever position, not only during manual screwing but also in automatic screwing when bottling in the production line.

[0034] All of the above technical solutions signify that at no time during the manual screwing operation is the screwing accompanied with the assurance that the user screws the thread to the end.

DESCRIPTION OF THE DRAWINGS

[0035] The present descriptive specification is completed with a set of drawings wherein by way of illustration of a preferred embodiment of the invention and not restrictively, the following has been represented:

[0036] Figure 1 shows a representation of the solution described as habitual in the state of the art wherein a section is shown of the thread of the bottle in development.

[0037] Figure 2 shows a representation of the invention wherein a section is shown of the thread of the bottle in development.

[0038] Figure 3 is a perspective of the neck of the bottle wherein the projections and the different inclinations are shown which the planes can adopt which delimit them.

PREFERRED EMBODIMENT OF THE INVENTION

[0039] In the light of the above figures, the present invention comprises a screw-thread for bottles with asymmetric necks which offers the advantage of avoiding the need to apply particular forces before managing to secure the union between the bottle and the body to be screwed on reducing the dead sectors which give rise to false threading.

[0040] Figure 1 is a schematic representation of one of the solutions habitually employed in the state of the art and which serves as a basis for describing the drawbacks which it has and which are overcome by the
present invention.

In this representation, use has been made of arrows which indicate the direction of the gradients of the different inclined planes which constitute the thread projections. As a drawing criterion, the arrows are directed toward points where the radius (with respect to the main axis) is less.

In this representation a horizontal band (2) is shown which corresponds to the development of the surface of the upper section of the bottle.

On this cylindrical surface (2), is situated another (1) of lesser diameter, after a step, and which is precisely that which externally incorporates the screw-thread.

By means of a cross-hatched rectangle (3) the internal projection is shown of the element to be screwed on, for example the cylindrical body of a gun for spraying, which is that which rests on the screw-thread.

The screw-thread, far from being single helical worms, is comprised of projections delimited by planes, many of them inclined. The latter are those which by means of arrows have their inclination indicated.

Each screw-thread is configured by different sections which are described below:

1. An oblique first entry section (4) of the rectangular projection (3) to be screwed on which establishes the entry in accordance with a helical movement of raised pitch.

2. A horizontal wedge-shaped section (5) which is that which establishes, by means of its lower side, the second advance with no pitch whatever and which in turn, for the inclination which it has, facilitates the upper entry of the body to be screwed on. Under this section is established a horizontal passage which implies that the rectangular projection (3) to be screwed on has to surpass a wedge-shaped projection (6) intended to facilitate entry and oppose release.

3. A last section (8) delimits the butt halting the advance when screwing. On the left-hand side it is sometimes oblique to facilitate entry and on other occasions instead of being a vertical butt it is a retaining wedge (7) by applying a certain pressure on the incoming rectangular projection (3).

Both the oblique entry section (4) and the final section (8) create other dead sectors of thread entry.

The drawback of this screw-thread lies in the use of the wedge (6) which serves to secure the screw-thread in its final position. The entry requires a major particular effort to surpass it which is not always applied for the reasons already cited.

In figure 2 the screw-thread is shown according to the present invention wherein the design has been simplified by employing a single projection (9) with various differentiated sections:

1. A first section (9) of helical pitch (9.1) and rounded end to facilitate the entry of the rectangular projection (3) which pertains to the element to be screwed on. This section is that which during the screwing operation presents a raised forward pitch.

The projection likewise shows a wedge-shaped oblique external surface which facilitates entry in whatever position indicated in figure 2 by means of small black arrows.

2. A straight second section (9.2), of zero pitch, which guides the rectangular projection (3) of the body to be screwed on to the final position.

3. A vertical butt (9.3) which delimits the final position after the screwing operation.

4. Finally it is wished to distinguish the rounded and pointed end (9.4) of the projection (9). Between these two points an entry area is defined shown by means of the broad unfilled arrows; and which by repetition, over the length of the perimeter make any angle of attack possible in practice.

Additionally between threaded sections (9) some vertical pressure projections (10) are incorporated which apply pressure progressively on the cylindrical surface of the body to be screwed on increasing, without particular effort, the friction between the bottle and this body.

These vertical projections (10) are prolonged until surpassing the height of the horizontal straight section (9.2) with the object of establishing contact and progressive pressure from the start.

In this preferred embodiment use has been made of vertical pressure projections (10) of trapezoidal cross-section so that as well as on the top, on one side and the other it has inclined planes which favour both screwing on and unscrewing.

The number of vertical projections (10) need not necessarily be coincident with that of the screw projections (9) since they can vary according to the pressure to be applied, nor need they necessarily be coincident in projected height.

Considered within the same invention is the use of cylindrical projections (10) the cross-section of which forms an arc of a curve wherein in this case the support against the cylindrical surface to be screwed on is established over the length of a vertical line.

In figure 3 the same screw-thread is shown in a detail in perspective wherein the vertical pressure projections (10) are identified as well as the details of the markedly pointed screw-threads permitting the entry into an almost complete sector in contrast to that known in the state of the art.
With these vertical pressure projections (10) there is no requirement for particular efforts since the entry thereof is progressive and once the final is reached, their pressure adequately secures one body against the other. It is certainly possible that once screwed on to the end, these vertical projections (10) make unscrewing more difficult. In the event that the body to be screwed on is that of a spray gun, the retention is sufficient in order to be able to manipulate the unit from the gun.

The essential nature of this invention is not altered by variations in materials, form, size and arrangement of the component elements, described in a non-restrictive manner, sufficient for an expert in the matter to proceed to its reproduction.

Claims

1. Screw-thread for bottles of asymmetric neck, of among the screw-threads which have a first entry stage according to a helical rotation, plus a second section of zero pitch and which has means of retention on the final position, **characterised in that** it comprises projections (9) in three sections, a first oblique section (9.1) corresponding to the entry of the projection (3) of the body to be screwed on which has a raised pitch, is wedge-shaped above and pointed (9.4) with the end rounded, a second straight horizontal section (9.2) which corresponds to the final securing rotation with zero pitch, and a third vertical section (9.3) which serves as butt for delimiting the final position of the body to be screwed on; having additionally between each of these projections (9), some vertical pressure projections (10) which act on the cylindrical surface of the body to be screwed on.

2. Screw-thread for bottles of asymmetric neck, according to claim 1, **characterised in that** the number of vertical pressure projections (10) is not coincident with the number of thread projections (9) depending on the pressure to be applied.

3. Screw-thread for bottles of asymmetric neck, according to claim 1, **characterised in that** the vertical pressure projections (10) have a trapezoidal cross-section.

4. Screw-thread for bottles of asymmetric neck, according to claim 1, **characterised in that** the vertical pressure projections (10) have a curved cross-section.

5. Screw-thread for bottles of asymmetric neck, according to claim 1, **characterised in that** the vertical pressure projections (10) have a projection height different to that of the thread projections (9).
**DOUGHTY CONSIDERED TO BE RELEVANT**

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The present search report has been drawn up for all claims.

**CATEGORY OF CITED DOCUMENTS**

- **X**: particularly relevant if taken alone
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**Place of search**: BERLIN

**Date of completion of the search**: 10 November 2003

**Examiner**: Schultz, O
ANNEX TO THE EUROPEAN SEARCH REPORT
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