

(19) **DANMARK**

(10) **DK/EP 4010262 T3**



Patent- og
Varemærkestyrelsen

(12) Oversættelse af
europæisk patentskrift

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- (51) Int.Cl.: **B 65 D 41/04 (2006.01)** **B 65 D 43/02 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2022-11-21**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2022-11-02**
- (86) Europæisk ansøgning nr.: **21794360.4**
- (86) Europæisk indleveringsdag: **2021-10-15**
- (87) Den europæiske ansøgnings publiceringsdag: **2022-06-15**
- (86) International ansøgning nr.: **EP2021078682**
- (87) Internationalt publikationsnr.: **WO2022079281**
- (30) Prioritet: **2020-10-16 EP 20202258** **2020-10-30 DE 202020004567 U**
- (84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**
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- (54) Benævnelse: **SKRUELÅG**
- (56) Fremdragne publikationer:
EP-A1- 3 224 152

DESCRIPTION

[0001] The present invention is related to a screw cap for containers with a threaded neck portion.

[0002] A screw cap according to the preamble of claim 1 is known from EP 3 224 152 A1.

[0003] The object of the invention is to improve the design of the cap so that it can be screwed onto the threaded neck portion of a container more easily.

[0004] This object is solved by the screw cap according to claim 1. Preferred embodiments are described in the subordinate claims and the description following hereafter.

[0005] The invention is based on the basic idea to have the material of the engagement protrusion be arranged preceding the start of the thread. The cap that in conjunction with the tool and the method described in EP 3 224 152 A1 is to be brought into a certain alignment with the threaded portion of the threaded neck portion of the container will engage more easily with the threaded portion of the threaded neck portion of the container, if the material of the engagement protrusion precedes the start of the thread. If used in the context of the tool and the method described in EP 3 224 152 A1, the cap would be held preceding the threaded portion of the threaded neck portion of the container a little. It has shown that this arrangement allows the cap to be screwed on more easily.

[0006] The invention is directed to a screw cap for containers with a threaded neck portion. In a preferred embodiment, the screw cap is a unitary piece. The screw cap preferably is made up of HDPE (high-density polyethylene), R-HDPE (recycled high-density polyethylene), PP (polypropylene), R-PP (recycled polypropylene), Bio-HPDE (bio high-density polyethylene), Bio-PP (bio polypropylene),. In a preferred embodiment, the screw cap is made by way of Continuous Compression Moulding (CCM) or Injection Moulding.

[0007] The screw cap according to the invention has a base portion comprising a top surface and a bottom surface. The top surface is the surface that is intended to be on the outside of the cap, when the cap is attached to the container. The bottom surface is that surface that faces and borders the space that is delimited by the annular portion that raises from the base portion.

[0008] The bottom surface has a center. In a preferred embodiment, the bottom surface is circular and the center is the center of the circle that prescribes the outer end of the bottom surface, which typically is that end that merges into the inner surface of the annular portion.

[0009] In a preferred embodiment, the bottom surface is a flat surface. The bottom surface being a flat surface does not exclude projections or recesses to raise from the bottom surface or to go into the bottom surface.

[0010] The screw cap according to the invention has an annular portion raised from the base portion. The annular portion is a wall that raises at an angle, preferably at an angle of 45° to 134° , more preferably at an angle of 60° to 120° , more preferably at an angle of 90° to the bottom surface. The wall preferably has the shape of the outer circumferential surface of a truncated cone or the outer circumferential surface of a cylinder.

[0011] The annular portion has an inner surface and an outer surface. The outer surface may be a smooth surface or a riffled surface for easier opening or may have some other texture. The inner surface preferably is - apart from the threaded portion arranged on it - a smooth surface.

[0012] The screw cap according to the invention has a threaded portion arranged on the inner surface of the annular portion. The threaded portion has at least one thread. Preferably the threaded portion has several threads, preferably two or more, preferably three or more threads. In a preferred embodiment, the threaded portion has several threads that have their respective start arranged at the same height relative to the bottom surface.

[0013] The thread extends from a start into a first circumferential direction around the inner surface. The start being that part of the thread, where the material of which the thread is made, starts to rise from the inner surface. Threads can be designed to start with a steep step that extends radially inwards from the inner surface. In such a design, the step would be the start of the thread. More often, however, a thread has a section of constant height, where the material that makes up the thread in that section rises above inner surface with a constant height, but the thread in these designs has a starting portion, where the material that makes the thread in said starting portion rises ramp-like. The start in such a design will be the point where the ramp starts to rise from the inner surface.

[0014] The thread can be considered to have a start and an end and to extend from the start to the end. In a preferred embodiment, the start is the point where a first ramp starts to rise from the inner surface, where the ramp ends in a section of constant height, whereby in this preferred embodiment the end is the point, where a second ramp arranged at the other side of the section of constant height starts to rise from the inner surface. The start is arranged at a different distance to the bottom surface than the end. In a preferred embodiment, the start is arranged further away from the bottom surface than the end. In an alternative embodiment, the start is arranged closer to the bottom surface than the end.

[0015] In a preferred embodiment, where the threaded portion of the screw cap has several threads, the threads are preferably spaced at equal distance around the inner surface. In a preferred embodiment, the shape and size of each thread of the threaded portion is the same.

[0016] The screw cap according to the invention has an engagement portion arranged on the bottom surface and protruding from the bottom surface.

[0017] The reference line of the engagement portion is defined to run along the bottom surface and to cross the center, whereby all material that makes up the engagement portion is arranged on one side of the reference line, the reference line touching at least one point of material that makes up the engagement portion. If the engagement portion has a side that runs along a line that crosses the center, the reference line will be touching this side.

[0018] The engagement portion has two lines, each of which runs along the bottom surface and to cross the center, whereby all material that makes up the engagement portion is arranged on one side of the reference line, the reference line touching at least one point of material that makes up the engagement portion. The one of these two lines will delimit the engagement portion on one side, for example the right hand side and the other of these two lines will delimit the engagement portion on the opposite side, for example on the left hand side. Of these two lines, the reference line is the line that is closer to the start of the thread.

[0019] In a preferred embodiment, the engagement portion protrudes from the bottom surface with constant or with reducing width, but without an undercut.

[0020] According to the invention the angle between

- a plane that contains the center and the start and is orientated perpendicular to the bottom surface and
- the reference line is larger than 0° and smaller than 30° , more preferably larger than 2° and smaller than 26° , more preferably larger than 5° and smaller than 30° , more preferably larger than 5° and smaller than 26° , more preferably larger than 10° and smaller than 30° , more preferably larger than 10° and smaller than 26° .

[0021] The material that makes up the engagement portion is arranged on one side of the reference line and the plane that contains the center and the start and is orientated perpendicular to the bottom surface is arranged on the other side of the reference line.

[0022] The thread extends away from the plane in a direction away from the reference line.

[0023] In a preferred embodiment the thread and the engagement portion are parts of an one piece element.

[0024] In a preferred embodiment a recess is arranged next to the engagement portion.

[0025] In a preferred embodiment the engagement portion is a rectangular block.

[0026] In a preferred embodiment, the screw cap has two or more engagement portions, preferably three or more engagement portions arranged on the bottom surface. In a preferred embodiment the screw cap has the same number of engagement portions and threads. In a preferred embodiment the angle between

- a plane that contains the center and the start of a respective thread and is orientated perpendicular to the bottom surface and
- the reference line of a respective engagement portion is the same for all pairs of threads and engagement portions, a pair of a thread and an engagement portion being defined as an engagement portion and that thread that has its end closest to the reference line of the respective engagement portion.

[0027] The screw cap may be applied to a packaging container for foodstuffs itself comprising a body portion and a threaded neck portion of polymer material.

[0028] The cap according to the invention can be used with the tool and can be used as part of the method described in EP 3 224 152 A1.

[0029] In the following, the invention will be described with reference to Fig. that show only embodiments of the invention.

Fig. 1 shows a perspective view onto the cap according to the invention,

Fig. 2 shows a top view onto the cap of Fig. 1.

[0030] Fig. 1 shows a screw cap 200 for containers with a threaded neck portion. The screw cap 200 has a base portion 210 comprising a top surface 212 and a bottom surface 214, the bottom surface 214 having a center 216. The screw cap 200 has an annular portion 220 raised from the base portion 210, the annular portion 220 having an inner surface 224 and an outer surface 222. The screw cap 200 has a threaded portion 252 arranged on the inner surface 224 of the annular portion 220. The thread 218 extends from a start 226 into a first circumferential direction A around the inner surface 224, the start 226 being that part of the thread 218, where the material of which the thread 218 is made, starts to rise from the inner surface 224. The thread 218 has a section of constant height, where the material that makes up the thread 218 in that section rises above inner surface 224 with a constant height, but the thread 218 in this design has a starting portion 228, where the material that makes the thread 218 in said starting portion 228 rises ramp-like. The start 226 is the point where the ramp starts to rise from the inner surface 224

[0031] The screw cap 200 an engagement portion 240 arranged on the bottom surface 214 and projecting from the bottom surface 214, the engagement portion 240 having a reference line R that runs along the bottom surface 214 and crosses the center 216, whereby all material that makes up the engagement portion 240 is arranged on one side of the reference line R, the reference line R touching at least one point of material that makes up the engagement portion 240. In the design shown in Fig. 1 the engagement portion 240 is a rectangular block and the reference line R touches the inner most corner of the rectangular block.

[0032] The angle between

- a plane P (symbolized by the dashed line that shows where the plane P would intersect the screw cap 200) that contains the center 216 and the start 226 and is orientated perpendicular to the bottom surface 224 and
- the reference line R is larger than 0° and smaller than 30° . In the embodiment shown in Fig. 1 it is about 5° .

[0033] The bottom surface 214 is a circular surface and the center 216 is the center of the circle.

[0034] Three engagement portions 240 are arranged on the bottom surface 214.

[0035] The material that makes up the engagement portion 240 is arranged on one side of the reference line R and the plane P that contains the center 216 and the start 226 and is orientated perpendicular to the bottom surface 224 is arranged on the other side of the reference line R.

[0036] The tread 218 extends away from the plane P in a direction away from the reference line R.

[0037] The thread 218 and the engagement portion 240 are parts of an one piece element.

[0038] A recess 242 is arranged next to the engagement portion 240.

REFERENCES CITED IN THE DESCRIPTION

Cited references

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Patent documents cited in the description

- EP3224152A1 [0002] [0005] [0005] [0028]

PATENTKRAV

1. Skruelåg (200) til beholdere med en halsdel med gevind omfattende:

- en basisdel (210), der omfatter en øvre flade (212) og en bundflade (214), hvilken bundflade (214) har en midte (216);

5 - en ringformet del (220), der står op fra basisdelen (210), hvilken ringformet del har (220) en indvendig flade (224) og en udvendig flade (222);

- en gevinddel (252), der er anbragt på den indvendige flade (224) af den ringformede del (220), hvilken gevinddel (252) har mindst ét gevind (218), hvilket gevind (218) strækker sig fra en start (226) ind i en første periferisk retning (A) omkring den indvendige flade (224), hvor
10 starten (226) er den del af gevindet (218), hvor det materiale, hvoraf gevindet er fremstillet, begynder at stige fra den indvendige flade (224),

- en indgrebsdel (240), der er anbragt på bundfladen (214) og rager frem fra bundfladen (214), hvilken indgrebsdel (240) har en referencelinje (R), der løber langs bundfladen (214) og krydser midten (216), hvorved alt materiale, der udgør indgrebsdelen (240), er anbragt på én side
15 af referencelinjen (R), hvilken referencelinje (R) rører mindst ét punkt af det materiale, der udgør indgrebsdelen (240),

kendetegnet ved, at vinklen mellem

• et plan (P), der indeholder midten (216) og starten (226) og er orienteret vinkelret på bundfladen (214) og

20 • referencelinjen (R)

er større end 0° og mindre end 30° ,

hvorved det materiale, der udgør indgrebsdelen (240), er anbragt på én side af referencelinjen (R) og planet (P), der indeholder midten (216) og starten (226) og er orienteret vinkelret på bundfladen (214), er anbragt på den anden side af referencelinjen (R), og gevindet
25 (218) strækker sig væk fra planet (P) i en retning væk fra referencelinjen (R).

2. Skruelåg ifølge krav 1, **kendetegnet ved, at vinklen mellem**

• et plan (P), der indeholder midten (216) og starten (226) og er orienteret vinkelret på bundfladen (224) og

30 • referencelinjen (R)

er større end 2° og mindre end 26° .

3. Skruelåg ifølge krav 1 eller 2, **kendetegnet ved, at bundfladen (214) er en cirkelformet flade, og, ved, at midten (216) er cirkelns midte.**

4. Skruelåg ifølge et hvilket som helst af kravene 1 til 3, **kendetegnet ved, at** tre indgrebsdele (240) er anbragt på bundfladen (214).

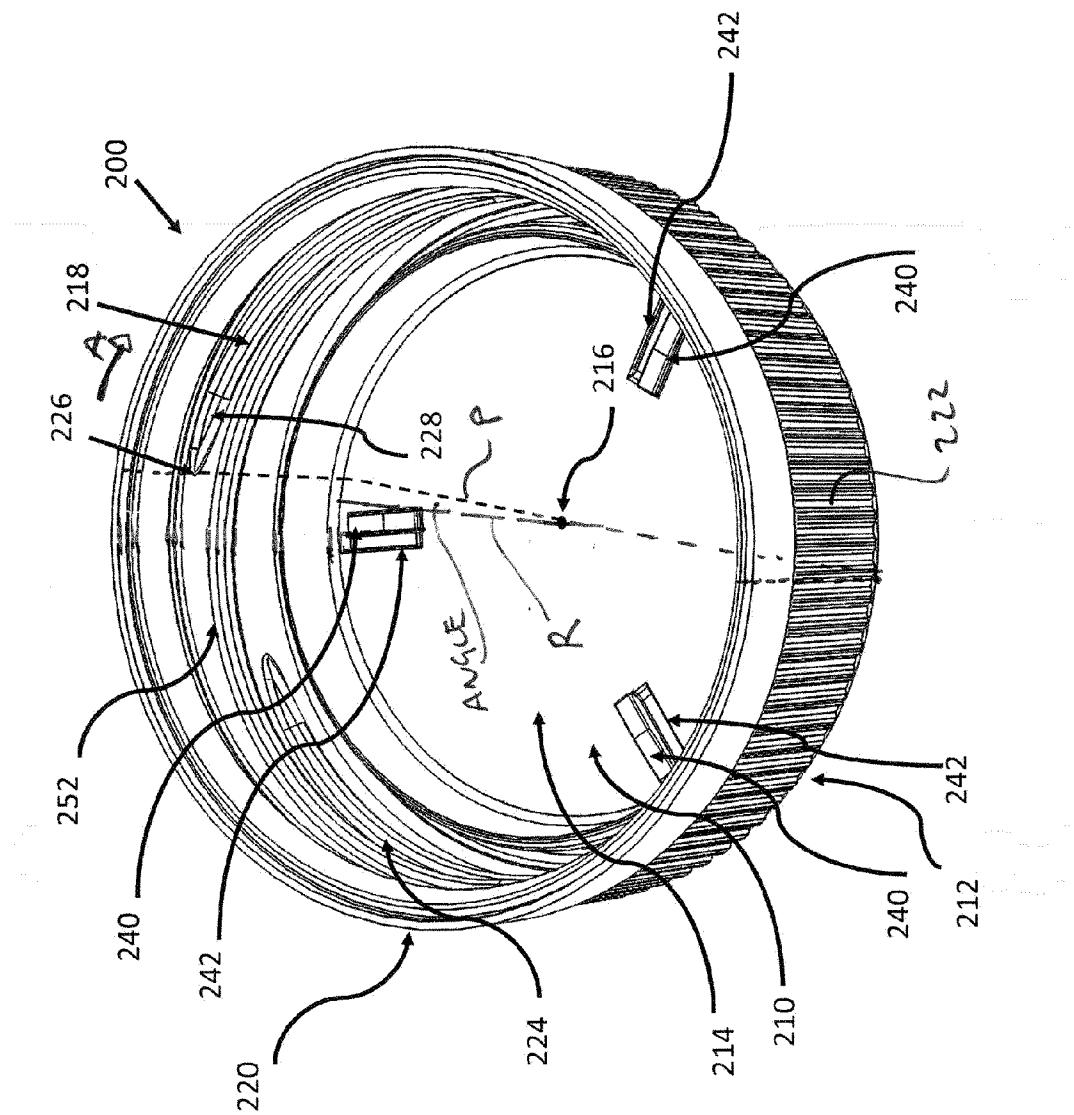
5 5. Skruelåg ifølge et hvilket som helst af kravene 1 til 4, **kendetegnet ved, at** gevindet (218) og indgrebsdelen (240) er dele af et element i ét stykke.

6. Skruelåg ifølge et hvilket som helst af kravene 1 til 5, **kendetegnet ved, at** en indskæring (242) er anbragt på siden af indgrebsdelen (240).

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7. Skruelåg ifølge et hvilket som helst af kravene 1 til 6, **kendetegnet ved, at** indgrebsdelen (240) er en rektangulær blok.

DRAWINGS



1-5-4

Fig. 2

