(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 022 223 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
26.07.2000 Bulletin 2000/30

(51) Int. Cl.[7]: **B65D 1/02**, B65D 23/10

(21) Application number: **00100137.9**

(22) Date of filing: **07.01.2000**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **19.01.1999 IT MI990029**

(71) Applicant: **San Pellegrino S.p.A.**
20154 Milano (IT)

(72) Inventor: **Cittadini, Paolo**
20154 Milano (IT)

(74) Representative:
Modiano, Guido, Dr.-Ing. et al
Modiano & Associati SpA
Via Meravigli, 16
20123 Milano (IT)

(54) High-strength bottle for beverages

(57) A bottle for beverages and the like having high mechanical strength, comprising a cylindrical body (2) having, in a substantially central region thereof, a grip region (4) whose diameter is reduced with respect to the diameter of the remaining portions of the body, wherein the grip region (4) has a gradual and marked reduction in diameter accompanied by a gradual increase in thickness which reaches its maximum value at the portion of the grip region (4) that has the smallest diameter.

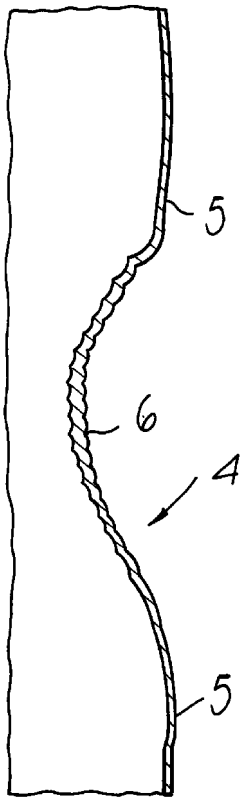

Fig. 2

EP 1 022 223 A1

Description

[0001] The present invention relates to a high-strength bottle for beverages. More particularly, the invention relates to a bottle which is adapted in particular for highly carbonated beverages.

[0002] It is known that many bottles having different shapes and structures are currently commercially available which have, at a central region, a grip region provided by a gradual reduction in the diameter of the bottle in order to allow the user to hold it easily and firmly.

[0003] For example, bottles are known which have central grips provided by regions which have a reduced diameter and accordingly have an increased thickness.

[0004] A first type of bottle has, at the grip region, a marked reduction in diameter, an annular choke which accordingly allows to have a significant increase in thickness exclusively in that region and therefore have adequate mechanical strength only at said region.

[0005] A second type of bottle with a central grip region instead has a gradual but not marked reduction in diameter; in this case the gradual decrease in diameter entails an insufficient increase in thickness which does not allow to achieve adequate mechanical performance.

[0006] In this case, when the user grips a bottle at the grip region whose diameter decreases gradually but insufficiently with respect to the remaining portions of the bottle, said region is not strong enough to withstand the compression force that the user inevitably applies when gripping the bottle.

[0007] This drawback occurs both for pressures applied from the outside of the bottle and for pressures applied from its inside, for example if the bottle is filled with highly carbonated beverages or water.

[0008] The aim of the present invention is to provide a bottle for beverages which is highly resistant to external pressure and to internal pressure.

[0009] Within the scope of this aim, an object of the present invention is to provide a bottle for beverages and the like in which the central grip region of the bottle is shaped so as to have high-level mechanical strength characteristics.

[0010] Another object of the present invention is to provide a bottle for beverages and the like which is highly reliable, relatively easy to manufacture and at competitive costs.

[0011] This aim, these objects and others which will become apparent hereinafter are achieved by a bottle for beverages and the like having high mechanical strength, comprising a cylindrical body having in a substantially central region thereof a grip region whose diameter is reduced with respect to the diameter of the remaining portions of said body, characterized in that said grip region has a gradual and marked reduction in diameter accompanied by a gradual increase in thickness which reaches its maximum value at the portion of said grip region that has the smallest diameter.

[0012] Further characteristics and advantages of the invention will become apparent from the detailed description of preferred but not exclusive embodiments of the bottle according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is an elevation view of a first embodiment of a bottle according to the present invention;
Figure 2 is a detailed partial sectional view of the thickness variation of the body of the bottle according to the invention; and
Figure 3 is an elevation view of a second embodiment of the bottle according to the present invention.

[0013] With reference to the above figures, the bottle according to the present invention, generally designated by the reference numeral 1, comprises a substantially cylindrical body 2, provided with many-sided feet 3 which are adapted to constitute a resting base for the body 2, and a substantially central region of the body 2, the particularity of which consists in that its diameter decreases gradually with respect to the adjacent portions of the body 2 and its thickness is greater than in conventional bottles and most of all is extensive.

[0014] In practice, the central portion of the bottle, designated by the reference numeral 4, has a gradual and marked reduction in diameter, so as to obtain a band whose thickness gradually increases toward the minimum diameter of the bottle, and with a region of intermediate thickness for blending the nominal bottle diameter and the minimum one.

[0015] This gives the entire grip region or area 4 (considered as the region of the bottle where the diameter is smaller than nominal) a higher performance, in mechanical terms and in terms of carbon dioxide loss barrier, with respect to conventional bottles.

[0016] The increase in thickness of the body 2 at the central region 4 occurs in step with the decrease in diameter of the region 4 and therefore said increase in thickness is achieved at the region that needs it most.

[0017] The need to increase the mechanical strength of the body 2 of the bottle is in fact felt mainly at the region or portion that has the smallest diameter.

[0018] Mechanical strength is provided in both directions, i.e., with respect to the pressure applied by the carbon dioxide (from the inside of the bottle outwards, tending to inflate the grip region 4, returning it to the nominal diameter of the body 2 of the bottle) and with respect to the gripping action performed by the consumer, which would tend to compress the bottle when taking hold of it.

[0019] The grip region 4 is therefore substantially shaped so as to have a reduction in diameter which is initially gradual and then becomes marked: it is gradual at a region 5 and marked at a region 6, both of said regions being part of the region 4.

[0020] The reduction in diameter at the region 5 is preferably approximately at least 25% with respect to the nominal diameter of the bottle, i.e., of the body 2.

[0021] The gradual and marked reduction in diameter is accompanied by a gradual increase in the thickness of the bottle, which reaches its maximum value at the minimum diameter of the grip region 4.

[0022] The grip region 4 described above can be further reinforced by means of ribs, arranged for example as shown in figure 1 or as shown in figure 3. The ribs of figure 1, designated by the reference numeral 7, are spiral-shaped, while the ribs of figure 3, designated by the reference numeral 8, are ring-shaped, and the rings, like the spirals, have a pitch which decreases to a minimum at the ring of the grip region 4 that has the smallest diameter.

[0023] The ribs substantially further stiffen the geometry of the grip region 4 and the stiffening is a function of the distance between the different ribs and of the depth of said ribs.

[0024] The distance between the ribs reaches its minimum at the grip region 4 having the smallest diameter (designated by the reference numeral 6), and the distance increases, while depth decreases, as the diameter of the grip region 4 increases, blending away where the nominal diameter of the bottle is reached.

[0025] In practice it has been observed that the bottle according to the present invention fully achieves the intended aim, since it allows to have a grip region which is functionally improved with respect to conventional bottles and in which despite a marked reduction in the diameter of the bottle there is also a gradual increase in thickness in inverse proportion to the reduction in the diameter of the bottle, accordingly obtaining a minimum-diameter region which also has the maximum thickness with respect to the remaining portions of the bottle.

[0026] In practice, the materials used, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

[0027] The disclosures in Italian Utility Model Application No. M199U000029 from which this application claims priority are incorporated herein by reference.

[0028] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A bottle for beverages and the like having high mechanical strength, comprising a cylindrical body having, in a substantially central region thereof, a grip region whose diameter is reduced with respect to the diameter of the remaining portions of said body, characterized in that said grip region has a gradual and marked reduction in diameter accompanied by a gradual increase in thickness which reaches its maximum value at the portion of said grip region that has the smallest diameter.

2. The bottle according to claim 1, characterized in that said grip region having a gradual and marked reduction in diameter has a minimum diameter which is at least 25% smaller than the diameter of the remaining portions of said body.

3. The bottle according to claim 1, characterized in that said grip region having a gradual and marked reduction in diameter has, at regions where the nominal diameter of the bottle and the minimum diameter blend, regions whose thickness is intermediate between the thickness of the remaining portions of the bottle body and the thickness of said minimum-diameter portion of the grip region.

4. The bottle according to claim 1, characterized in that the increase in thickness of said grip region is directly proportional to the reduction in diameter of said grip region.

5. The bottle according to one or more of the preceding claims, characterized in that said grip region is provided with a plurality of stiffening ribs.

6. The bottle according to claim 5, characterized in that said stiffening ribs are arranged in a spiral pattern at said central grip region.

7. The bottle according to claim 5, characterized in that said ribs are of the annular type.

8. The bottle according to one or more of the preceding claims, characterized in that the distance between said ribs decreases gradually as the diameter of said grip region decreases.

9. The bottle according to one or more of the preceding claims, characterized in that the depth of said ribs gradually increases as the diameter of said grip region decreases.

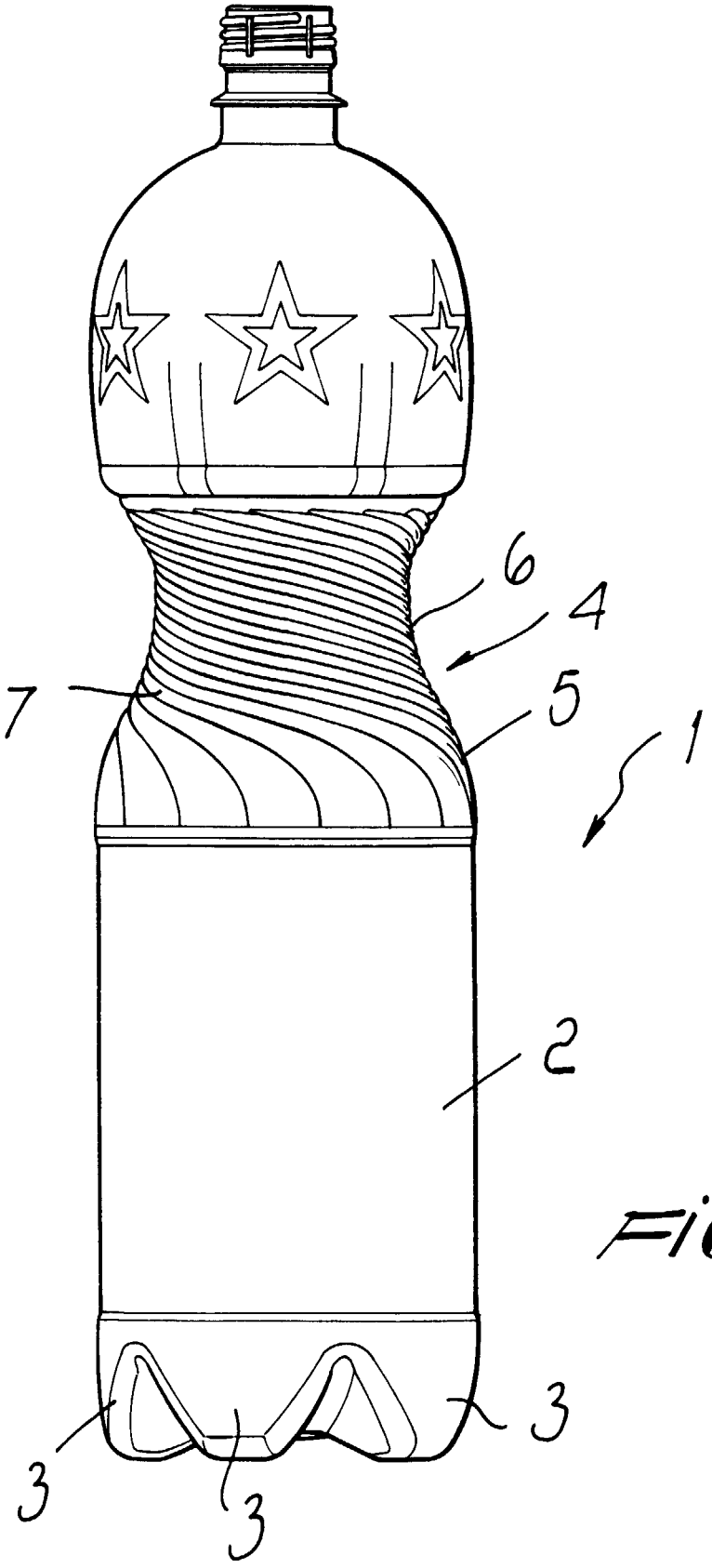

Fig. 1

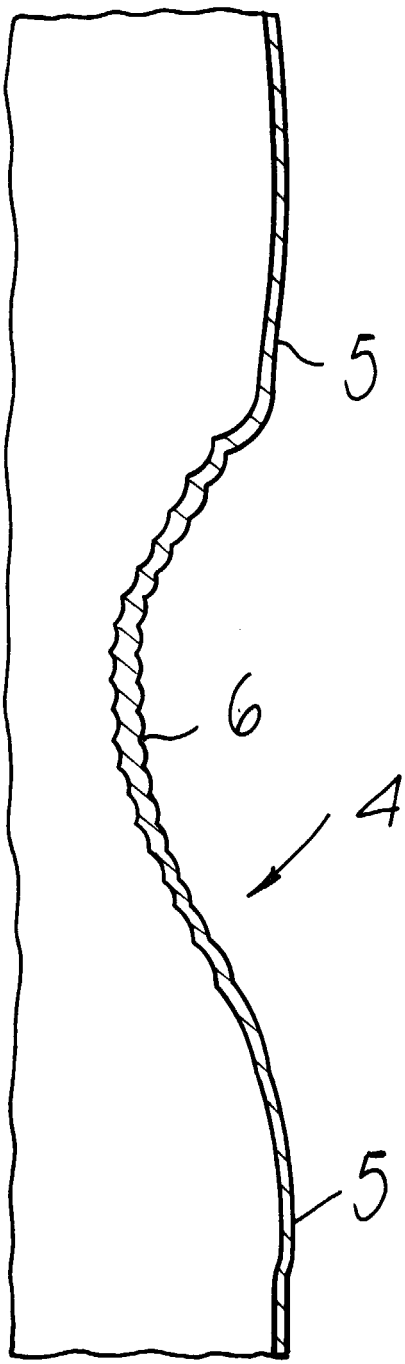

Fig. 2

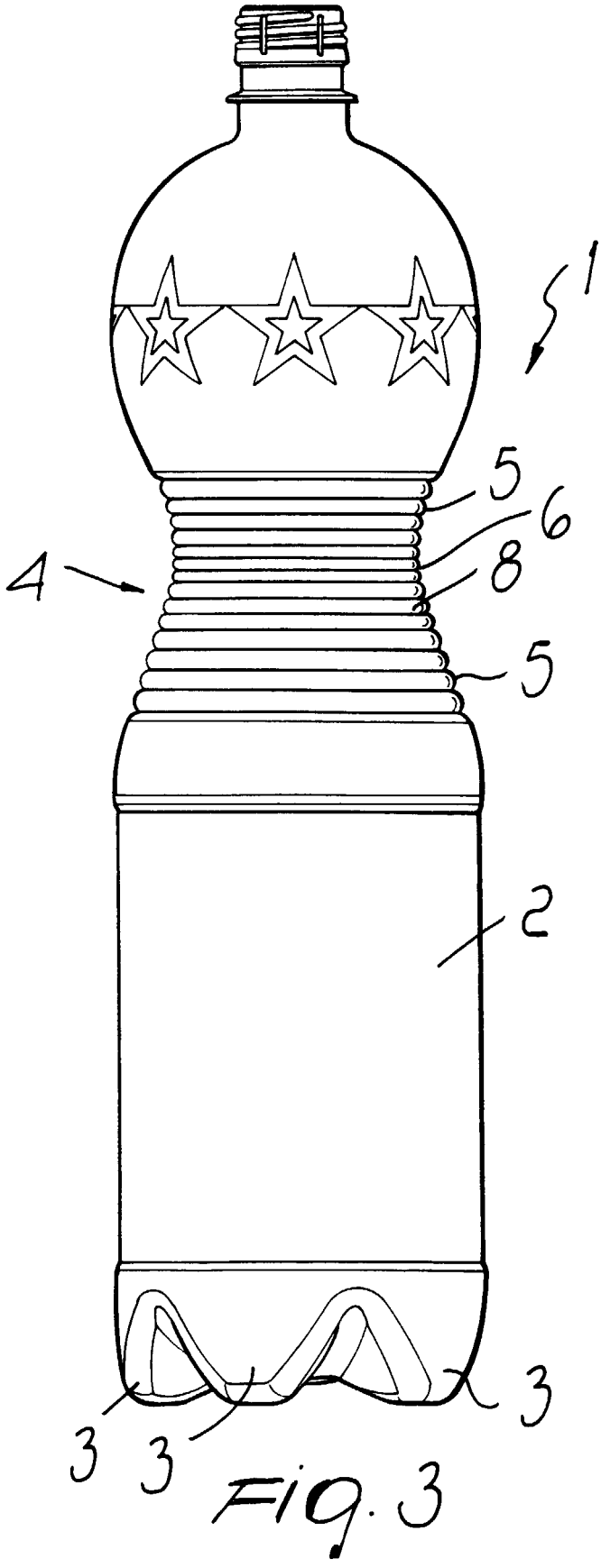

Fig. 3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 10 0137

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y A	US 3 536 500 A (CLEEREMAN) 27 October 1970 (1970-10-27) * column 2, line 17 - line 59; figures *	1-3,5,7 4,9	B65D1/02 B65D23/10
Y	FR 1 326 132 A (UNIPOL) 9 August 1963 (1963-08-09) * the whole document *	1-3,5,7	
A	FR 1 310 475 A (NATAF) 8 March 1963 (1963-03-08) * page 1, right-hand column, line 30 - page 2, left-hand column, line 11; figure 1 *	1	
A	FR 1 408 275 A (SERE) 29 November 1965 (1965-11-29) * page 1, left-hand column, line 32 - right-hand column, line 11; figure 1 *	6,8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	31 March 2000	Newell, P

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 10 0137

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

31-03-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3536500 A	27-10-1970	NONE	
FR 1326132 A	09-08-1963	NONE	
FR 1310475 A	08-03-1963	CH 371700 A	
		CH 378713 A	
		DE 1154009 B	
		DE 1432217 A	19-12-1968
		FR 1225309 A	30-06-1960
		GB 868170 A	
		GB 988587 A	
		LU 40897 A	08-02-1962
		NL 272321 A	
		OA 512 A	15-07-1966
		US 3182861 A	11-05-1965
FR 1408275 A	29-11-1965	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82