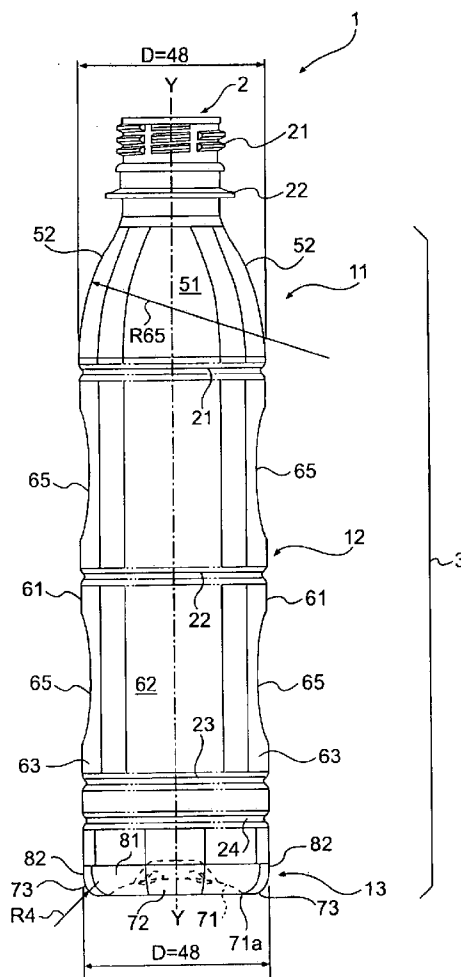
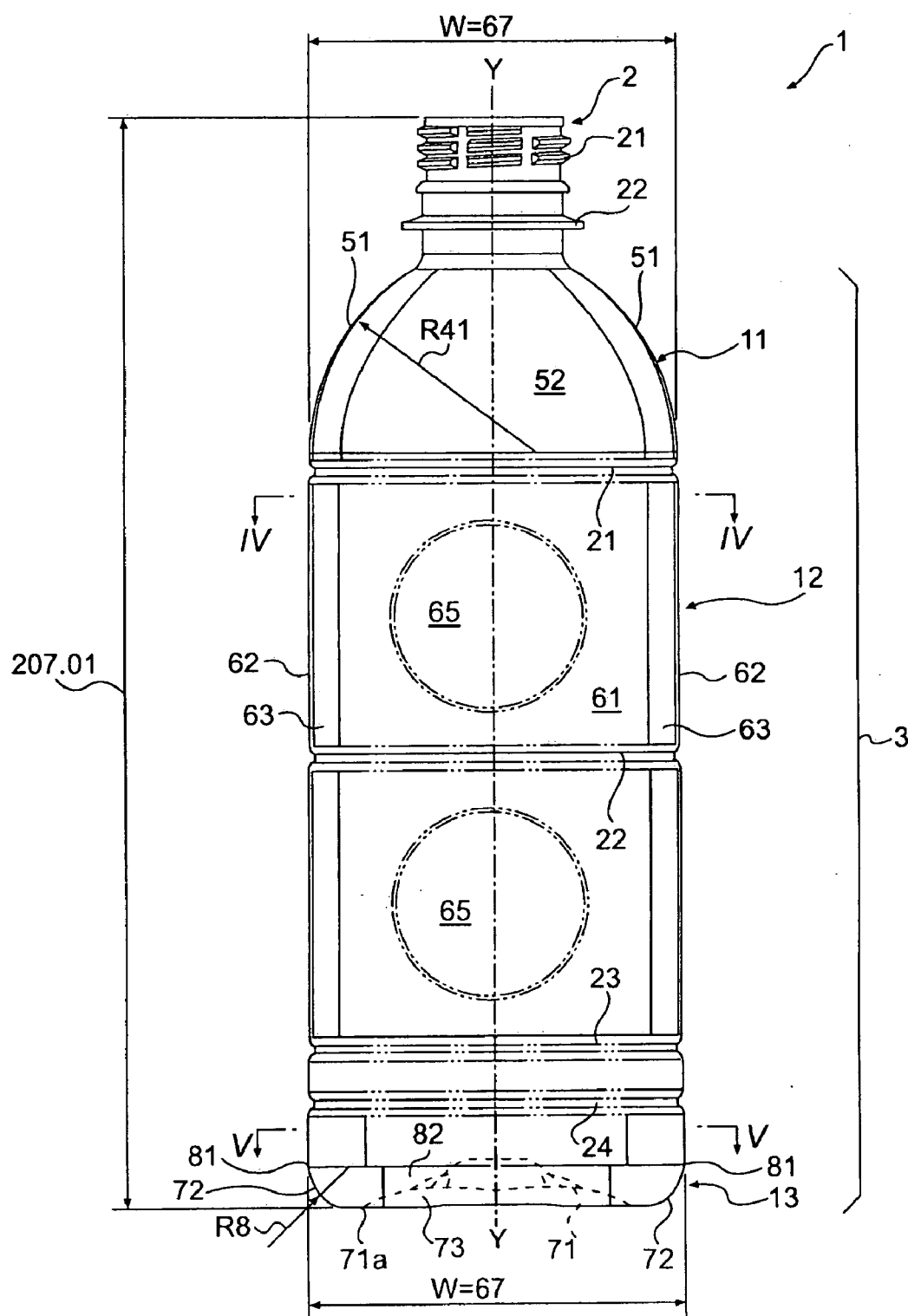




(43) **Pub. Date:** **Jan. 7, 2010**



**FIG. 1**

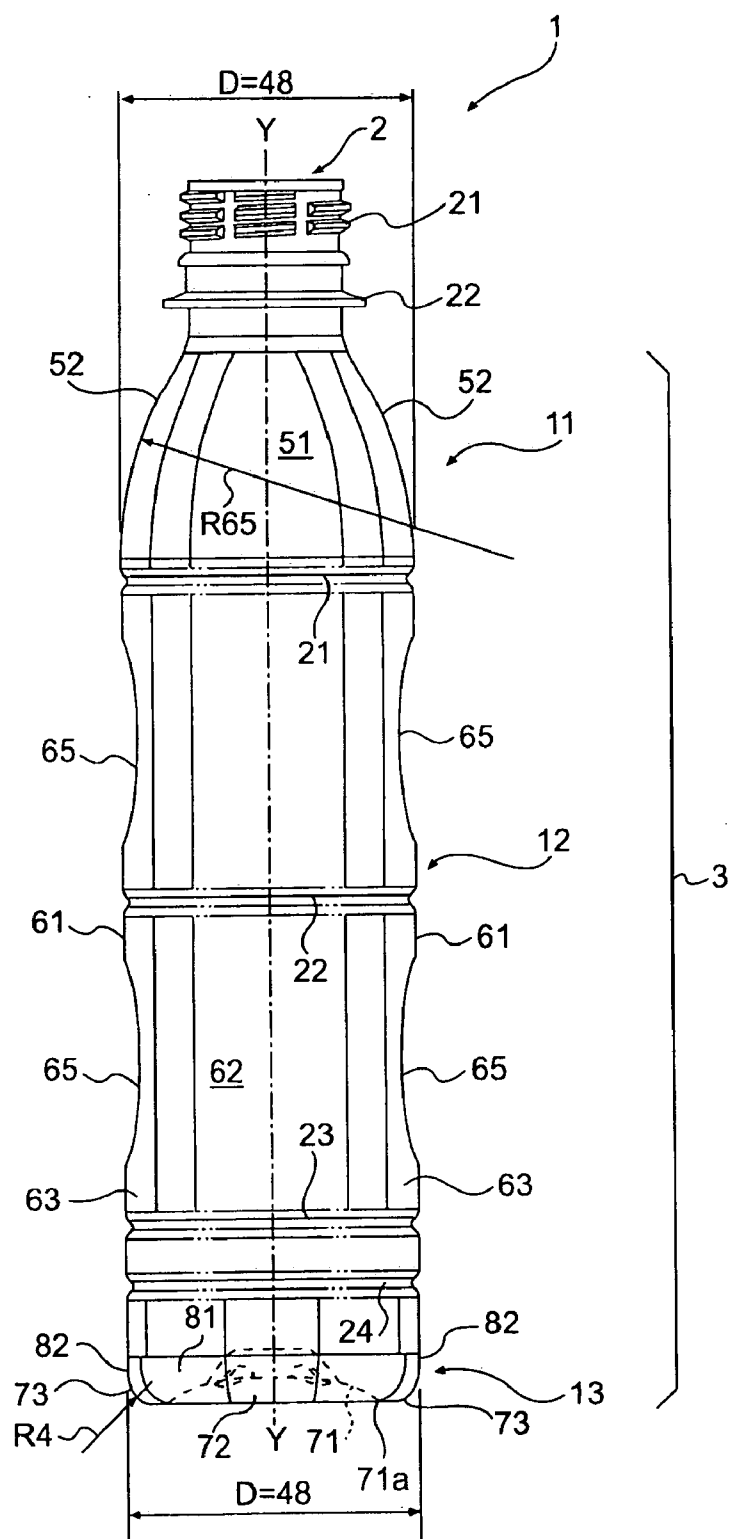


FIG. 2

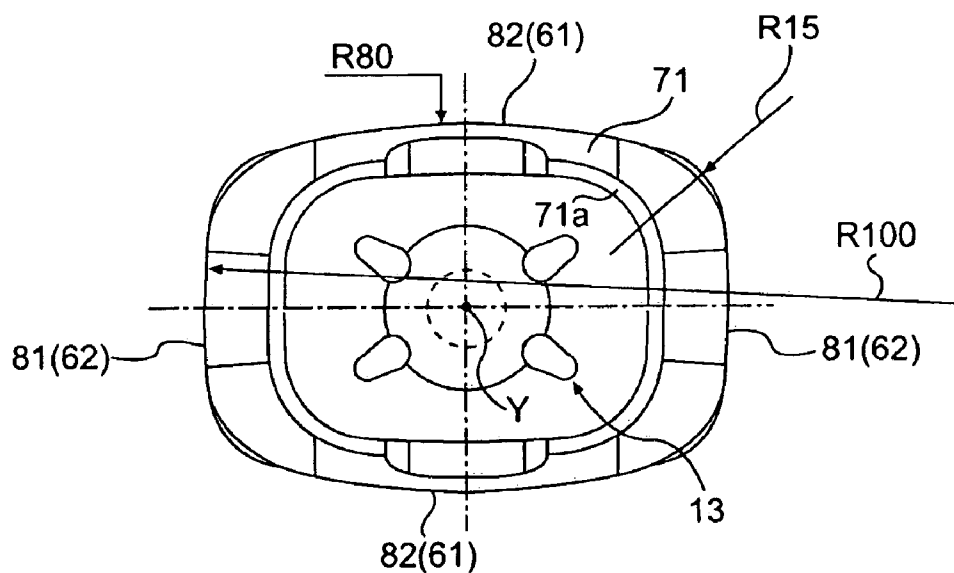


FIG. 3

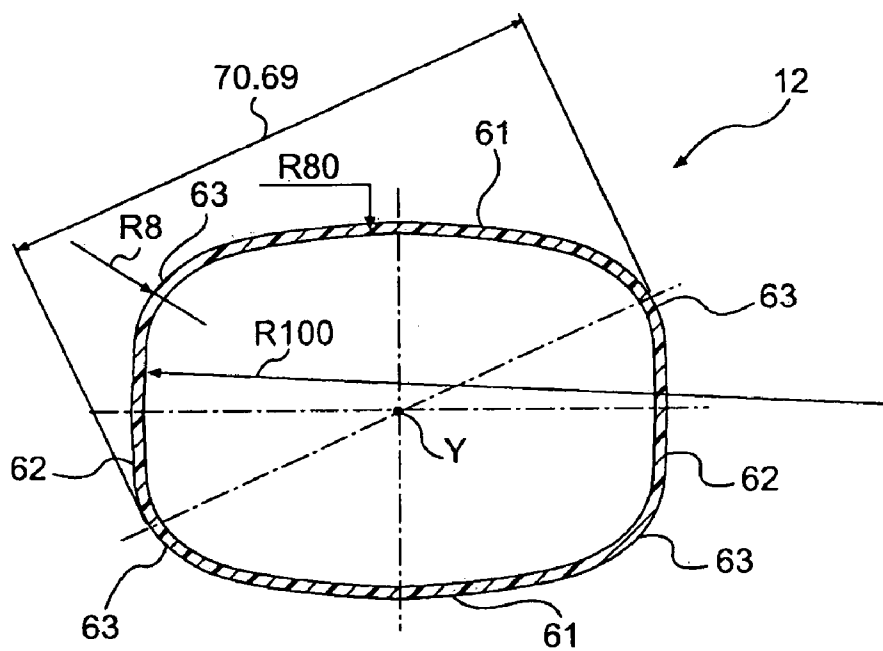


FIG. 4

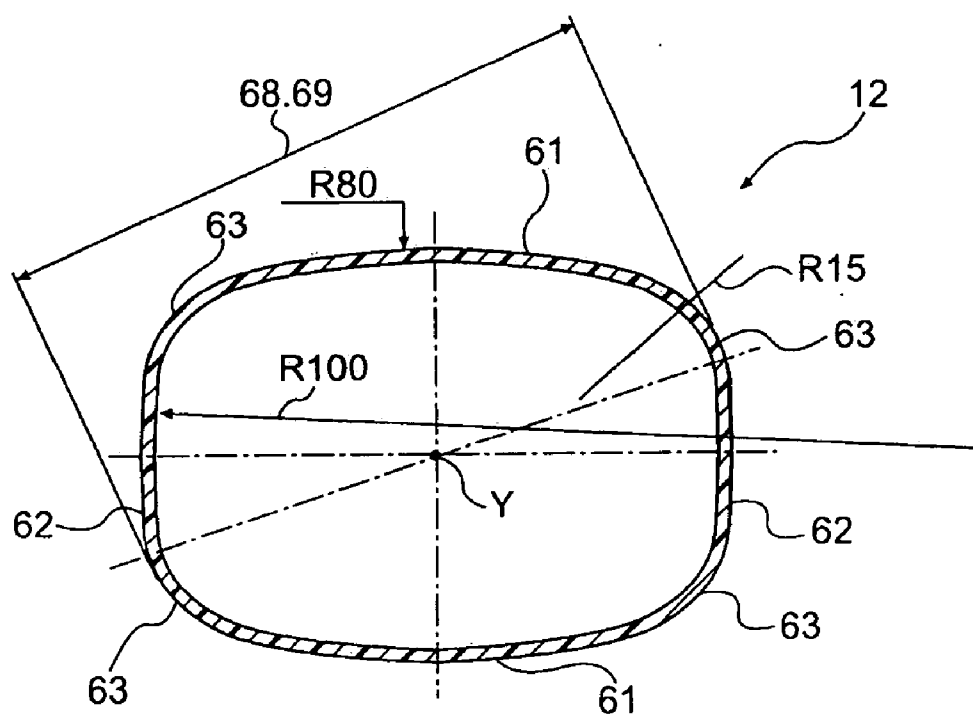


FIG. 5

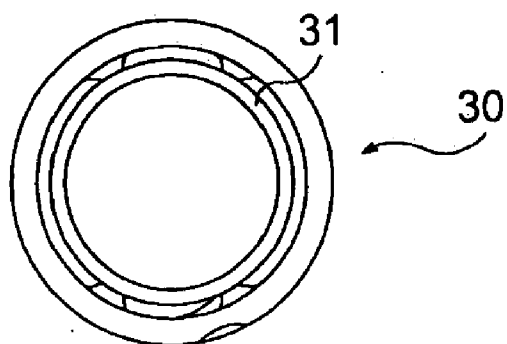


FIG. 6A

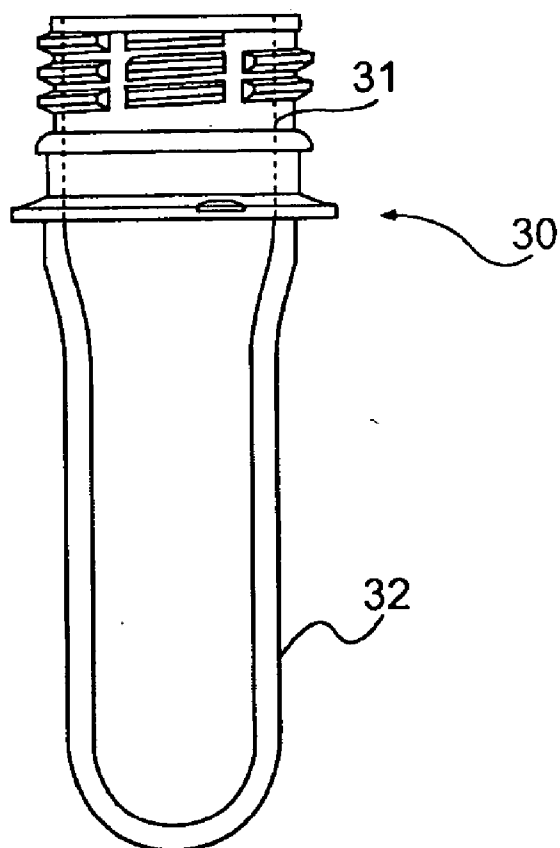


FIG. 6B

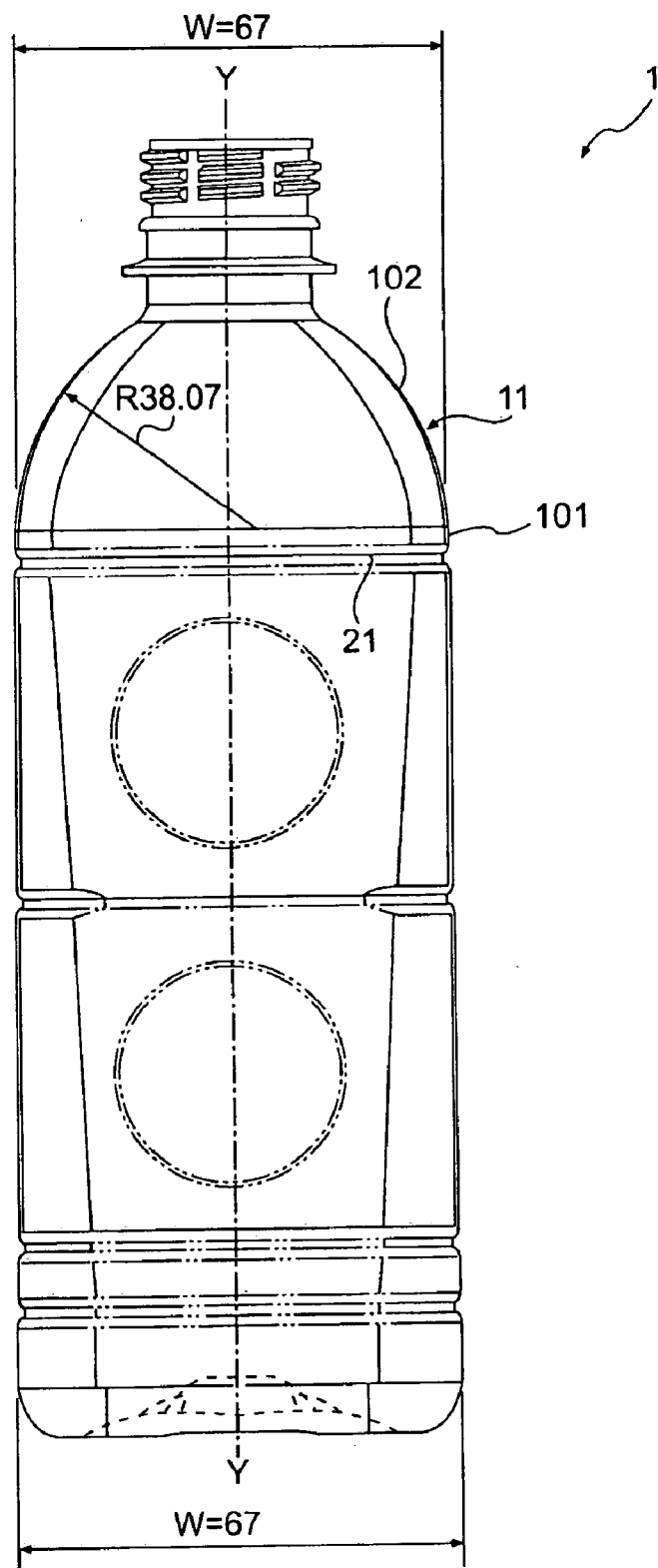


FIG. 7

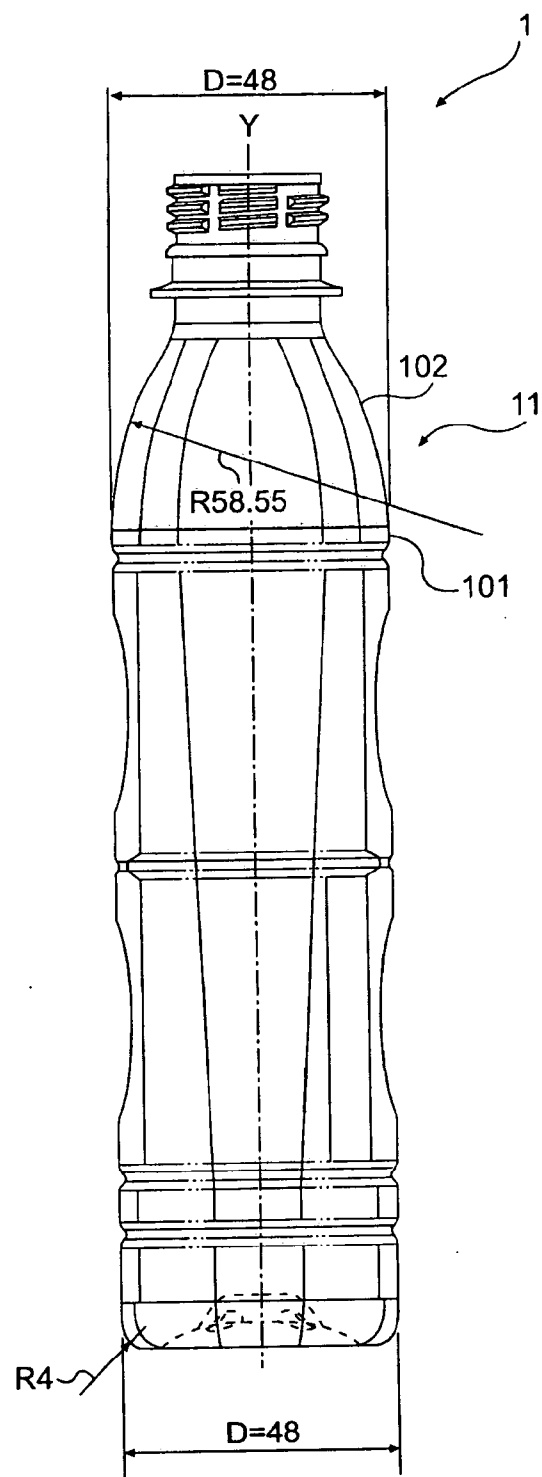


FIG. 8

PLASTIC BOTTLE**TECHNICAL FIELD**

[0001] The present invention relates to a plastic bottle used for beverages.

PRIOR ART

[0002] In general, plastic bottles, represented by PET bottles, are widely known as containers that are filled with beverages such as Juice and cold beverages. Plastic bottles are commercially available in small sizes of 500 ml and under, medium sizes of around 1,000 ml and large sizes of 1,500 to 2,000 ml. Consumers store the relatively large medium and large sized bottles in refrigerators, etc., and drink the contents by pouring them into a cup as need requires, while they place small bottles containing 500 ml in a bag, etc., and carry them, or place them on desks, and drink the contents bit by bit directly from the bottle. These are the standard practices with these bottles of differing sizes.

[0003] Bottles are designed in a variety of ways with respect to height and shape. The height of bottles is designed in accordance with the shelves at the place of sale and the pockets in refrigerators, and they are for example designed to a height of 218 mm. In addition, the section of bottles designed in various shapes, with round and square shapes being the mainstream shapes. Among these, bottles called Battered bottles, whose section is close to rectangular or oval, are also being developed, based on the tendencies of consumer's orientations for convenience and aesthetic appeal (for examples, see Patent Documents 1 and 2).

[0004] The manufacture of conventional bottles termed flattened bottles is carried out by blow molding with the hot parison or cold parison methods (for examples, see Patent Documents 2 and 4). In the event that this kind of bottle is formed with a parison whose section is a perfect circle, the amount of stretching of the parison differs between the minor axis (the depth direction of the bottle) and the major axis (the width direction of the bottle), so there is variation in the flesh thickness of bottles that are molded products, and it is difficult to obtain the required mechanical strength. A variety of methods for obtaining mechanical strength continue to be developed, and a molding method for making the flesh thickness of the bottle uniform, as described for example in Patent Document 4, is known as one method for this.

[0005] In each of the above-mentioned Patent Documents, those bottles whose section is close to rectangular or oval are called "flattened bottles", and the ratio between the maximum major axis of the trunk and the minimum minor axis of the trunk (the aspect ratio) is used as the criterion for expressing the flatness. However, the aspect ratio indicated in for example Patent Document 2 is 1.1, so the section thereof is close to rectangular, and it is difficult to say that this it is a flattened bottle when it is to this extent. In addition, even though 2,000 ml bottles whose aspect ratio exceeds 1.0 are commercially available, they are long at approximately 80 mm in the minor axis direction thereof, and it is hard to claim that these are flattened bottles if one looks at the matter on the whole.

[Patent Document 1] Japanese Kokai Patent Bulletin No. 2001-48147

[Patent Document 2] Japanese Kokai Patent Bulletin No. 2005-81641

[0006] [Patent Document 3] Japanese Kokai Patent Bulletin No. H11[1999]-170344

[Patent Document 4] Japanese Kokai Patent Bulletin No. 2000-127230

DISCLOSURE OF THE INVENTION**Problems that the Invention Attempts to Solve**

[0007] In this manner, it cannot be claimed that conventional bottles are substantially flattened, and they have been hard to grasp and hold. In addition, even assuming that they are flattened, the portability of the large sized bottles is poor for consumers. Moreover, flattened bottles may also fall over easily on top of a desk, but no consideration at all is given to this in the conventional Patent Documents.

[0008] The present invention takes as its purpose the provision of a plastic bottle that can improve grippability and portability, being an item created with the focus on a practical flattened bottle that takes into consideration consumers' needs.

Means for Solving the Problems

[0009] The inventive plastic bottle for achieving the above-mentioned purposes has a mouth that is the opening through which the beverage flows, and a main body that is connected with said mouth, and that can hold a beverage inside it, and is configured such that when the width dimension of the main body is set at W, and the depth dimension is set at D, such that $1.2 \leq W/D \leq 1.8$, and moreover $40 \text{ mm} \leq D \leq 60 \text{ mm}$.

[0010] The inventive plastic bottle for achieving, the above-mentioned purposes has a mouth that is the opening through which the beverage flows, and a main body that is connected with said mouth, and can hold a beverage inside it, and the above-mentioned main body is formed in a flattened shape overall, and the depth dimension, which is the shorter of the width and depth of the above-mentioned main body, is at least 40 mm and no greater than 60 mm.

[0011] According to these configurations, the main body can be flattened substantially, and the portability of the bottle can be improved. In addition, since the depth dimension, which is the shorter dimension, is set at $40 \text{ mm} \leq D \leq 60 \text{ mm}$, the burden on the muscles of consumers who grip and hold the main body can be alleviated, and it becomes easier to carry the main body. In particular, when the depth dimension is less than 40 mm, the main body is hard to grab on to, and in addition there is the risk that the stability when the bottle is placed vertically will be impaired. On the other hand, when the depth dimension exceeds 60 mm, it cannot be claimed that the main body becomes substantially flattened, and it becomes hard to grip and hold it, and in addition it occupies a broad space inside for example the bag of the consumer, and there is the risk that this will cause the portability to decline. In addition, there is also the fact that the depth dimension is stipulated within the above-mentioned range, and when W/D exceeds 1.8, there is a possibility that the main body will become too flat, and there is the risk that the ease of gripping the main body or the stability of the bottle on top of desks, etc. will be impaired. In addition, when W/D falls below 1.2, it can no longer be claimed that the main body is flattened overall.

[0012] According to one mode of the present invention, it is preferable that at the bottom of the main body both ends in the width direction and both ends in the depth direction are rounded chamfered, and both the above-mentioned ends in the depth direction are round chamfered with a diameter that is smaller than that of the both ends in the width direction.

[0013] According to this configuration, it is possible to raise the moldability of the bottom part with for example blow molding, compared with a case where rounded chamfering is not done. Specifically, the bottom part is molded by stretching to the farthest position from the mouth, and both ends in the width direction and both ends in the depth direction at the bottom can be molded easily by carrying out rounded chamfering as described above. On the other hand, when the diameter of the rounded chamfering is large, the bottle falls over easily. Out of consideration of these circumstances, the diameter of the rounded chamfering of both end parts in the depth direction (the shorter direction), where the bottle might fall over easily, is made small than that of both end parts in the width direction. By so doing, the stability of the bottom can be ensured, and it is possible to make it hard for the bottle to fall over.

[0014] According to one mode of the present invention, it is preferable that main body has two first side walls that extend substantially in the width direction, and two second side walls that extend substantially in the depth direction, such that they are respectively positioned between the said two first side walls and moreover link these.

[0015] According to this, it is possible to compose the main body with four side walls.

[0016] According to one mode of the present invention, it is preferable that at least one of either the above-mentioned first side walls and the above-mentioned second side walls is curved outwards from the bottle.

[0017] According to this configuration, it becomes possible to grip and hold the main body such that it fits the palm of the consumer's hand. Owing to this, the sense of fit between the palm of the hand and the bottle can be improved, and it is thus possible to make the bottle easier to carry.

[0018] According to one mode of the present invention, it is preferable that the corners between the above-mentioned first side walls and the above-mentioned second side walls are chamfered or rounded chamfered.

[0019] According to this configuration, as compared with a configuration wherein the corners are angular, the sense of fit between the palm of the hand and the bottle can be improved, and the bottle becomes even easier to carry. In addition, since the distance between the corners, which are located at opposing angles, becomes shorter to the extent that it is chamfered or rounded chamfered, it is possible to raise the mechanical strength of the main body.

[0020] According to one mode of the present invention, it is preferable that the lower part of the above-mentioned main body is chamfered or rounded chamfered at a greater value than the upper part of the same.

[0021] According to this configuration, the lower part of the main body, where the distance from the mouth is longer, is chamfered or rounded chamfered at a greater value than the upper part of the same. Owing to this, it is possible to raise the moldability by for example blow molding, etc., compared with a case where the chamfering or rounded chamfering is fixed in an up-down direction, or a case where the lower part of the main body becomes larger.

[0022] According to one mode of the present invention, it is preferable that the distances between two corners located at opposed angles is formed such that the distance at the lower part of the above-mentioned main body is shorter than that at the upper part thereof.

[0023] According to this configuration, the moldability can be raised in the same manner as noted above.

[0024] According to one mode of the present invention, it is preferable that the main body has vacuum absorption panels on at least two of the side walls.

[0025] According to this configuration, the decompression inside the bottle can be absorbed by the vacuum absorption panel, so it is possible to hold in check the deformation of the bottle that accompanies decompression.

[0026] According to one mode of the present invention, it is preferable that at least two side walls are side walls that extend substantially in the width direction of the main body.

[0027] Compared with the side walls that extend in the relatively short depth direction the side walls that extend in the relatively long width direction are relatively large, so they can be formed easily by decompression. As in the case of the above-mentioned configuration, it is possible to hold in check optimally the deformation of the bottles due to decompression, by forming a vacuum absorption panel on the sides that extend in the relatively long width direction.

[0028] According to one mode of the present invention, it is preferable that concave ribs are formed along the circumferential direction on the above-mentioned main body.

[0029] The vertical hardness of a substantially flattened main body like that described above is relatively low, but it is possible to raise the hardness of the main body by forming the above-mentioned ribs on the main body.

[0030] According to one mode of the present invention, it is preferable that when the transverse sectional area of the above-mentioned mouth is set at A and the transverse sectional area of the above-mentioned main body is set at S, $4.0 \leq S/A \leq 13.0$.

[0031] According to one mode of the present invention, it is preferable that the bottle capacity is at least 300 ml and no greater than 800 ml, or the bottle height is at least 140 mm and no greater than 220 mm.

[0032] According to this configuration, if the bottle capacity is at least 300 ml and no greater than 800 ml, a flattened bottle with a relatively small size can be provided. If the bottle height is at least 140 mm and no greater than 220 mm, the bottle can be placed suitably on the shelves of the sales place or in the pockets [of a refrigerator].

[0033] According to one mode of the present invention, it is preferable that the inventive plastic bottle is formed by stretch molding by the cold parison method with a parison whose section is a perfect circle.

[0034] According to this configuration, it is possible to form a substantially flattened bottle from a parison whose section is a perfect circle. Since the section of the parison is a perfect circle shape, it can be employed for the molding of other bottles as well, and it is also possible to raise productivity.

EFFECTS OF THE INVENTION

[0035] According to the inventive plastic bottle as described above, the main body becomes easier to grip, and in addition it is possible to raise its portability.

[Optimal Mode for Embodying the Invention]

[0036] A description is provided below of a plastic bottle for an optimal mode of embodiment of the present invention, with reference made to the attached figures.

First Mode of Embodiment

[0037] FIG. 1 to FIG. 3 are a front view, lateral view and bottom face view of the plastic bottle, respectively.

[0038] The plastic bottle 1 (hereinafter, simply "bottle 1") is molded by stretch molding, with its chief materials being a thermoplastic resin like polyethylene, polypropylene, polyethylene terephthalate, etc. The bottle 1 after molding is

washed and disinfected by disinfection with hot water, chlorine disinfectants, etc., after which it is filled with the beverage that is the contents.

[0039] One can cite as examples of the beverages various non-carbonated drinks like tea (green tea), Oolong tea, black tea, coffee and fruit juice. The bottle **1** in the present mode of embodiment can hold carbonated beverages as well, but it is optimal for holding non-carbonated beverages. In other modes of embodiment, the liquid filled into the bottle **1** is not restricted to beverages, and may be a foodstuff such as a sauce or rice wine for cooking purposes.

[0040] The bottle **1** has a mouth **2** and a main body **3**, and is formed in a flattened shape overall. The main body has integrally, in order from above along the central axis Y-Y (the vertical axis), a shoulder **11**, a trunk **12** and a bottom **13**, and bottle walls that can retain the beverage in the inside are composed by these. In addition, the main body **3** has four concave ribs **21**, **22**, **23** and **24** that are parallel to one another. The rib **21** is formed on the upper part of the main body **3**, the rib **22** is formed in the middle part of the main body **3**, and the ribs **23** and **24** are formed in the lower part of the main body **3**.

[0041] Here, the various terms employed in this Specification are defined as follows.

[0042] Inward towards the bottle refers to the direction that approaches to the central axis Y-Y more than the bottle wall, and outwards from the bottle refers to the direction that recedes from the central axis Y-Y more than the bottle wall. The width, depth and height of the bottle refer respectively to the length of the bottle in the left-right direction, the forward-backward direction and the up-down direction on the central axis Y-Y as referred to in FIG. 1. The depth of the bottle **1** of the present mode of embodiment is shorter than the width thereof. The minor axis direction of the bottle **1** refers to the depth direction of the bottle **1**, and the major axis direction of the bottle **1** refers to the width direction of the bottle. "Flattened" refers to the fact that the transverse sectional area of the main body **3** is flattened overall.

[0043] The bottle **1** in the present mode of embodiment is formed flat, by injection blow molding by the cold parison method, which is one kind of stretch molding technique. Since this molding method is well known a detailed description thereof is omitted here, but a simple description will be provided here of the parison that is employed in the cold parison method.

[0044] FIG. 6 is a figure showing the parison **30**.

[0045] The parison **30** is composed of a mouth **31** and a main body preformed part **32** that is linked to the lower end of the mouth **31**, and these are formed in a monobloc by injection molding. The mouth **31** has exactly the same shape and the same dimensions as the mouth **2** of the bottle **17** which is the final molded product. The main body preformed part **32** is the part that is finally molded into the main body **3**. Both the mouth **31** and the main body preformed part **32** are formed with a section that is a perfect circle shape. For example, the inner diameter of the mouth **31** is 21.47 mm. In addition, the outer diameter of the lower side of the main body preformed part **32** is 22.75 mm, its height is 65.5 mm and its flesh thickness is 2.8 mm.

[0046] Only the main body preformed part **32** of the parison **30** is heated by the cold parison method. After that, a rod used for stretching is inserted from the mouth **31** into the metal mold used for blowing, and the bottom of the main body preformed part **32** is stretched, and in addition compressed air

is blown into the mold and the main body preformed part **32** is distended, and adheres closely to the inner face of the mold. Then, by finally being cooled and hardened, a bottle **1** whose flesh thickness is roughly uniform is molded. In other modes of embodiment, parisons **30** with variant sectional shapes such as oval may also be employed, and other molding methods may be used.

[0047] It is preferable that the height of the bottle **1** is determined out of consideration of the size of the place of sale or that of consumers' refrigerators. Ordinarily, it is most common that the height of the shelves on which products are arrayed at such sales places as supermarkets or convenience stores is designed such that products with a height of about 230 mm can be displayed, assuming that the size is small. In addition, in the case of refrigerators for household use, the height of the pockets is designed such that they can contain milk cartons that are 1 liter in size. If such a state of affairs is taken into consideration, it is preferable that the height of the bottle **1** is at least 140 mm and no greater than 220 mm, and in the present invention it has been set at approximately 207 mm out of consideration of the width and depth dimensions of the bottle **1** (described below) as well as the capacity thereof.

[0048] If the capacity of the bottle **1** is at least 300 ml but no greater than 800 ml, a flattened bottle with a relatively small size can be provided, but it is still more preferable that is at least 300 ml but no greater than 500 ml, and it is approximately 450 ml in the present mode of embodiment. Then, both the maximum width and the maximum depth of the bottle **1** in the present mode of embodiment are located in part of the trunk **12**, and are 67 mm and 48 mm respectively (aspect ratio: approximately 1.4). By setting such maximum width and maximum depth dimensions, it becomes possible for the bottle **1** to be contained suitably in the pockets of refrigerators for home use (ordinarily, depth of 71.0 mm) and the bottle holders inside automobiles.

[0049] A description of the mouth **2**, shoulder **11**, trunk **12** and bottom **13**, which are the respective parts of the bottle **1**, is now provided with reference again to FIG. 1 to FIG. 3.

[0050] The mouth **2** is located at the upper end part of the bottle **1**, and composes the minimum diameter part of the bottle **1**. The upper end of the mouth **2** is open, and functions as the supply hole, drinking hole, pouring hole and outflow hole for beverages. A head slot (screw part) **21** that is composed such that a cap (not depicted in the figures) can be attached and removed is formed on the mouth **2**, and a flange **22** is formed on the lower side thereof. The cap is operated by the consumer, who turns it between the open position and the closed position.

[0051] The shoulder **11** is linked to the lower part of the mouth **2**, and is formed in a sloping shoulder shaped, in the front view in FIG. 1. The curvature radius R of the left and right side walls **51** and **51** of the shoulder **11** that extend in the depth direction is for example 41 mm. In addition, the front and back side walls **52** and **52** of the shoulder part **11** that extend in the width direction are curved such that they are distended outwards from the bottle, and their curvature radius R is for example approximately 65 mm. The corners between the side walls **51** and the side walls **52** is rounded chamfered (this is also called arc removal, rounding of the corners and R chamfering).

[0052] As in the case of the trunk **12** and the bottom **13**, the shoulder **11** has been formed flat overall. However, the aspect ratio changes in the up-down direction of the shoulder **11**. The aspect ratio in the shoulder **11** refers to the length in the width

direction relative to the length in the depth direction in the transverse section. The space between the shoulder part 11 and the trunk 12 is demarcated by the rib 21.

[0053] The trunk 12 is located between the shoulder 11 and the bottom 13, and is formed with left-right symmetry, front-rear contrast and point symmetry, with the center being the central axis Y-Y. The trunk 12 is composed of two front and rear side walls 61 and 61, and two left and right side walls 62 and 62. The two side walls 61 and 61 extend substantially in the width direction of the bottle 1. The two side walls 62 and 62 extend substantially in the depth direction of the bottle, such that they are respectively position between the two side walls 61 and 61 and moreover link them. Each of the corners 63 between the side walls 61 and side walls 62 are rounded chamfered.

[0054] Vacuum absorption panels 65 are formed on the two side walls 61 and 61. Two vacuum wall panels 65 are formed for each side wall, such that they are positioned in the center part of the regions above and below each side wall 61 demarcated by the rib 22. Each vacuum absorption panel 65 is composed of a circular shape, and is formed such that the central part of that circular shape sinks as much as possible inwards from the bottle.

[0055] The decrease in the bottle's internal pressure after it is filled with a beverage can be absorbed, and the deformation of the bottle 1 can be controlled. In particular, since vacuum absorption panels 65 are formed on side walls 61 that are easily deformed owing to the fact that they are relatively large regions, the deformation of the bottle 1 can be optimally held in check. In other modes of embodiment, the vacuum absorption panels 65 may be formed on the side walls 62, and it is possible to design them as appropriate, for example to make the shape of the vacuum absorption panels 65 oval or rectangular.

[0056] As shown in FIG. 4 and FIG. 5, the sectional shape of the trunk 12 is a shape that resembles an ellipse or a racetrack. The side walls 61 and the side walls 62 are curved such that they are distended outwards from the bottle, and the site in the direction that traverses the central axis Y-Y of the side walls 61 and the side walls 62 is curved the most towards the outside from the bottle. The curvature radiuses R of the side walls 61 and the side walls 62 are approximately 80 mm and approximately 1100 mm, respectively. In this manner, by giving the side walls 61 and the side walls 62 an arc shape, it becomes possible for a consumer to grip and hold them such that they faces of the side walls 61 and the side walls 62 fit the palm of his hand, and the consumer carry them easily.

[0057] In addition, as shown in FIG. 4 and FIG. 5, the corners 63 are rounded chamfered with the prescribed diameter (R). All four corners in the transverse section at the prescribed positions of the trunk 12 are formed in the same round face. In this manner, by round chamfering the corners 63, it is possible to improve the feeling of the fit between the palm of the consumer's hand and the bottle 1, and it is possible to make the bottle 1 even easier to carry. In addition, the distance between the two opposed corners 63, 63 that sandwich the central axis Y-Y becomes shorter to the extent that they are rounded chamfered, so it is possible to raise the strength of the trunk 12.

[0058] Moreover, as shown in FIG. 4 and FIG. 5, it is preferable that the diameter (R) of the corners 63 is variable above and below the trunk 12. In the present mode of embodiment, as shown in FIG. 4, at the part of the trunk 12 between the rib 21 and the rib 23, the corners 63 have been rounded

chamfered by R6 (a diameter of 8 mm). On the other hand, as shown in FIG. 5, at the part of the trunk 12 lower than the rib 24, the corners 63 have been rounded chamfered by R15 (a diameter of 15 mm). In addition, at the site in the middle of these, that is, at the part of the trunk 12 from the rib 23 to the rib 24, the corners 63 are made variable such that they gradually become larger from R8 to R15. Then, because of the settings of these diameters (R), the distance of the diagonal lines linking the space between the two corners 63 and 63 that passes through the central axis Y-Y is shorter in the case of the lower diagonal line (FIG. 5: 68.69 mm) than the upper diagonal line (FIG. 4: 70.69 mm).

[0059] In this manner, by making the diameters (R) of the corners 63 variable up and down, it is useful from the standpoint of moldability. Specifically, when the bottle 1 is molded from the parison 30, the distance of the lower part of the trunk 12 from the mouth 2 is further compared to the upper part thereof. As noted above, since the radius (R) of the rounded chamfering at the place where the distance is far is made larger, it is easier to do rounded chamfering of the corners 63 at the lower part of the trunk 12, and moldability can be raised overall.

[0060] The radiuses (R) of the corners may be not only the above-mentioned settings, and they may be R5 and above, from the standpoint of strength and moldability. However, it is preferable that it be a radius (R), for example no greater than R20, of a degree where the strength of the corners 63 does not decline. In other modes of embodiment, the corners 63 may be chamfered, and in that case it is preferable that it is similarly at least C5 and no greater than C20.

[0061] As for the trunk 12, the transverse sectional shape thereof is flattened overall. The aspect ratio of the trunk 12 in the present mode of embodiment, that is, the ratio (W/D) of the maximum width direction (W) to the maximum depth direction (D) is as noted above, and is approximately 1.4 (=67 mm/48 mm). Trunk 12 spans this up-down direction, and its aspect ratio W/D is constant. The minimum depth of the trunk 12 is the distance between the two opposed vacuum absorption panels, and is for example 44 mm.

[0062] In other modes of embodiment, the maximum depth D may be at least 40 mm and not greater than 60 mm, and preferably it is at least 45 mm and not greater than 51 mm, and still more preferably it is about 48 mm. When the maximum depth is less than 40 mm, it becomes hard to grasp the trunk 12, and in addition there is a risk that the stability when the bottle 1 is placed vertically will be impaired. On the other hand, when the maximum depth D exceeds 60 mm, it cannot be claimed that the trunk 12 is substantially flattened, and the ease of carrying is impaired. In addition, when the maximum depth D exceeds 60 mm, the area occupied by the bottle 1 inside for example a consumer's bag becomes larger, and there is a risk that this will cause the portability of the bottle 1 to decline.

[0063] In other modes of embodiment, if the aspect ratio W/D should be at least 1.2 and no greater than 1.8, and preferably at least 1.3 and no greater than 1.6, and still more preferably about 1.4. When the aspect ratio W/D is less than 1.2, the trunk 12 ends up having a transverse section that is close to a square shape, and it can no longer be said that the trunk 12 is flattened overall. In addition, when the aspect ratio W/D exceeds 1.8, the trunk ends up becoming too flat, and the ease of gripping the trunk 12 and the stability of the bottle 1 on top of desks, etc. is easily impaired.

[0064] Moreover, it is preferable that the following relationships are satisfied from the standpoint of the sectional area of the trunk 12. In other words, it is preferable that when the transverse sectional area of the mouth 2 is set at A, and the transverse sectional area of the trunk is set at S, the ratio A/S is at least 4.0 and no greater than 13.0. In the present mode of embodiment, it is set such that the ratio S/A 6.6.

[0065] The bottom 13 composes the bottom face 71 which serves as the face on which the bottle 1 lands on a surface. The bottom face 71 is sunken upwards so as to impart strength to the bottle 1. As shown in FIG. 3, of the bottom face 71, the oval face 71a viewed from the bottom face is the face where the bottom actually lands on a surface.

[0066] As shown in FIG. 1, at the bottom 13 both ends 72 and 72 in the width direction of the bottle 1 have been rounded chamfered. In addition, as shown in FIG. 2, at the bottom 13 both ends 73 and 73 in the depth direction of the bottle 1 have been rounded chamfered.

[0067] Specifically, the bottom 13 is composed of the bottom face 71, and the four wall parts 81, 81, 82 and 82 that substantially are linked perpendicularly to the bottom face 71. Two wall parts 81 and 81 are positioned at both ends in the width direction of the bottle 1, and extend in the depth direction. Two wall parts 82 and 82 are positioned at both ends in the depth direction of the bottle 1, and extend in the width direction. The two wall parts 82 and 82 respectively link the two walls parts 81 and 81 between these. Then, the ends 72 are sites where the wall parts 81 and the bottom face 13 intersect, and are rounded chamfered by R8 (diameter of 8 mm). In addition, the ends 73 are sites where the wall parts 82 and the bottom face 13 intersect, and are rounded chamfered by R4 (diameter of 4 mm).

[0068] In this manner, the ends 72 and 73 of the bottom 13 are rounded chamfered, so it is useful from the standpoint of moldability as noted above. That is, when the bottle 1 is molded from the parison 30, the ends 72 and 73 where the distance from the mouth 2 is furthest are rounded chamfered, so it is possible to raise the moldability of these ends 72 and 73. In addition, the radiuses (R) of the rounded chamfering of the ends 72 and the ends 73 are different, and the ends 73 in the minor axis direction (depth direction), where the bottle 1 may fall over relatively easily, is rounded chamfered with a value smaller than the ends 72. Owing to this, the stability of the bottom 13 when it lands on a surface can be raised, it is possible to prevent the bottle 1 from falling over.

[0069] In other modes of embodiment, it is preferable that the ends 72 in the major axis direction are rounded chamfered by at least R6, and a more preferable diameter (R) is the above-mentioned R6. In addition, it is preferable that the ends 73 in the minor axis direction are rounded chamfered by no greater than R5, and a more preferable diameter (R) is the above-mentioned R4. The above-mentioned wall parts 81 and 81 can be considered the lower ends of the side walls 62 and 62 of the trunk 12. Similarly, the above-mentioned wall parts 82 and 82 can be considered the lower ends of the side walls 61 and 61 of the trunk 12.

[0070] The ribs 21, 22, 23 and 24 are formed such that they sink inwards from the bottle along the circumferential direction of the main body 3. The ribs 21, 22, 23 and 24 function to impart the necessary horizontal rigidity to the flattened main body 3. When too many of this kind of concave ribs are formed on the bottle 1, the horizontal rigidity becomes too great, and there are times when this has on the contrary an adverse effect on the above-described decompression absorp-

tion effects. Accordingly, in the present mode of embodiment, the ribs are formed in a balanced way on the main body 3, and it is configured such that the vertical rigidity at the upper part of the trunk 12 is raised by the rib 21, the vertical rigidity of middle part of the trunk 12 is raised by the rib 22, and the vertical rigidity at the bottom part of the trunk 12 is raised by the ribs 23 and 24. The sectional shape of each rib can be designed as suitable, by making them for example a semicircular arc or a trapezoid in longitudinal section.

[0071] According to the bottle 1 for the present mode of embodiment that was described above it is possible to make the bottle so it has a substantially flattened main body 12, and the burden on the consumer's muscles can be alleviated, so the ease of gripping the bottle can be improved. In particulars a contour that has a roundish shape as the entirety of the above-mentioned main body 12 can improve optimally the ease of gripping by consumers.

[0072] In addition, since it is a flattened bottle 1 with a small size wherein the depth in the minor axis direction is set as noted above, it putting the bottle 1 in a bag and carrying it around can be facilitated, and its portability can be improved. Owing to this, it is possible to provide a practical bottle that is well-matched to the drinking habit of so-called "drinking while doing something else", wherein a person drinks a beverage a little bit at a time. In addition, since a parison 30 whose sectional shape is a perfect circle is employed as the parison 30 of the bottle 1, the productivity can be raised.

[0073] In other modes of embodiment, the sectional shape of the drum 12 may be a polygonal shape such as a hexagonal shape.

Second Mode of Embodiment

[0074] Next, a description is provided, with a focus on the differences, of the plastic bottle 1 for the second mode of embodiment, with reference to FIGS. 7 and 8. The difference with the first mode embodiment are that of the sites on the shoulder 11, is that there is a straight wall 101 that extends in the central axis Y-Y direction, at the site that is contact with the rib 21. The straight wall 101 has a height of for example 3 mm. The upper end of the straight wall 101 is linked to the curved wall 102, which is linked to the lower end of the mouth 2. The point of the present mode of embodiment that is useful compared with the first mode of embodiment is that it is possible to raise the strength of the shoulder 11.

BRIEF DESCRIPTION OF THE FIGURES

[0075] FIG. 1 is front view of the plastic bottle for the first mode of embodiment.

[0076] FIG. 2 is lateral view of the plastic bottle for the first mode of embodiment.

[0077] FIG. 3 is bottom view of the plastic bottle for the first mode of embodiment.

[0078] FIG. 4 is a section that is cut at the IV-IV line in FIG. 1.

[0079] FIG. 5 is a section that is cut at the V-V line in FIG. 1.

[0080] FIG. 6 is two figures showing the parison of the plastic bottle for the mode of embodiment; (A) is a plane and (B) is a section.

[0081] FIG. 7 is a front view of the plastic bottle for the second mode of embodiment.

[0082] FIG. 8 is a lateral view of the plastic bottle for the second mode of embodiment.

KEY

[0083] 1 . . . Bottle
 [0084] 2 . . . Mouth
 [0085] 3 . . . Main body
 [0086] 11 . . . Shoulder
 [0087] 12 . . . Trunk
 [0088] 13 . . . Bottom
 [0089] 21-24: Ribs
 [0090] 30: Parison
 [0091] 61, 62: Side walls
 [0092] 63: Corner
 [0093] 65: Vacuum absorption panel
 [0094] 71: Bottom face
 [0095] 72, 73: Ends
 [0096] 81, 82: Walls
 [0097] Y-Y: Central axis

What is claimed is:

1. A plastic bottle that has a mouth that is the opening through which the beverage flows, and a main body that is connected with said mouth, and that can hold a beverage inside it, wherein when the width dimension of the main body is set at W, and the depth dimension is set at D, it is configured such that $1.2 \leq W/D \leq 1.8$, and moreover $40 \text{ mm} \leq D \leq 60 \text{ mm}$.

2. A plastic bottle that has a mouth that is the opening through which the beverage flows, and a main body that is connected with said mouth, and that can hold a beverage inside it, wherein the above-mentioned main body is formed in a flattened shape overall, and the depth dimension, which is the shorter of the width and depth of the above-mentioned main body, is at least 40 mm and no greater than 60 mm.

3. The plastic bottle described in claim 1 or claim 2, wherein at the bottom of the above-mentioned main body both ends in the width direction and both ends in the depth direction are rounded chamfered, and both the above-mentioned ends in the depth direction are round chamfered with a diameter that is smaller than that of the above-mentioned both ends in the width direction.

4. The plastic bottle described in any one of the claims from claim 1 to claim 3, wherein the above-mentioned main body has two first side walls that extend substantially in the width direction, and two second side walls that extend substantially

in the depth direction, such that they are respectively positioned between the said two first side walls and moreover link these.

5. The plastic bottle described in claim 4, wherein at least one of either the above-mentioned first side walls and the above-mentioned second side walls is curved outwards from the bottle.

6. The plastic bottle described in claim 4 or claim 5, wherein the corners between the above-mentioned first side walls and the above-mentioned second side walls are chamfered or rounded chamfered.

7. The plastic bottle described in claim 6, wherein the lower part of the above-mentioned main body is chamfered or rounded chamfered at a greater value than the tipper part of the same.

8. The plastic bottle described in claim 6 or claim 7, wherein the distances between two corners located at opposed angles is formed such that the distance at the lower part of the above-mentioned main body is shorter than that at the upper part thereof.

9. The plastic bottle described in any one of the claims from claim 1 to claim 8, wherein the above-mentioned main part has vacuum absorption panels on at least two of the side walls.

10. The plastic bottle described in claim 9, wherein at least two of the above-mentioned side walls are side walls that extend substantially in the width direction of the above-mentioned main body.

11. The plastic bottle described in any one of the claims from claim 1 to claim 10, wherein concave ribs are formed along the circumferential direction on the above-mentioned main body.

12. The plastic bottle described in any one of the claims from claim 1 to claim 11, wherein when the transverse sectional area of the above-mentioned mouth is set at A and the transverse sectional area of the above-mentioned main body is set at S, $4.0 \leq S/A \leq 13.0$.

13. The plastic bottle described in any one of the claims from claim 1 to claim 12, wherein the bottle capacity is at least 300 ml and no greater than 800 ml, or the bottle height is at least 140 mm and no greater than 220 mm.

14. The plastic bottle described in any one of the claims from claim 1 to claim 13, wherein the said plastic bottle is formed by stretch molding by the cold parison method with a parison whose section is a perfect circle.

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