

FOLDING BAG AND METHOD OF PRODUCING THE SAME

Technical Field

[0001]

The present invention relates to a conveniently portable folding bag, and in particular, to a folding bag that is foldable into a flat rectangular shape simply by stretching the folding bag in the usage state by pulling both ends thereof away from each other, and also relates to a method of producing the folding bag.

Background Art

[0002]

Some folding bags are made of a sheet and configured to be folded small for carrying convenience when not in use. Various types of such folding bags have been proposed.

[0003]

A known example of the folding bag (see PTL 1) is an enclosure that is made of a sheet and configured to be folded, only by pulling both ends of the enclosure away from each other after use, into a flat rectangular belt-like predefined shape with the longitudinal ends of the enclosure being closed. The enclosure has an opening through which an object is put in or taken out. The opening is formed at a widthwise central portion or at a side edge of the enclosure as viewed in the state of the enclosure assuming the belt-like shape, and the opening extends linearly from one end to

the other end. The enclosure also has an enclosure body that has a half portion positioned at one side of the opening and the other half portion positioned at the other side of the opening. The enclosure body has a pleated structure having multiple pleats formed by repeatedly making mountain folds and valley folds of the sheet with a predetermined width.

[0004]

A belt having a small expandable single pocket pouch is also known (see PTL 2). The pouch has asymmetrically expanding fabric and pleats to expand according to its contents. When the pouch is empty, the pouch is fastened to the belt using pleats to fold the fabric in an overlapping shape. The pouch can remain snug against the wearer's body during use to hold small objects firmly and yet to expand to hold larger objects.

Citation List

Patent Literature

[0005]

PTL 1: International Publication No. 2017/033902

PTL 2: Japanese Unexamined Patent Application

Publication (Translation of PCT Application) No. 2010-517724

Summary of Invention

Technical Problem

[0006]

The foldable enclosure according to PTL 1 can be folded into a shape with the longitudinal ends being closed only by pulling both ends away from each other after use. When the enclosure body having the pleated structure is produced, however, it is necessary to perform heat-pressing to fix pleats, which leads to an increase in the production cost.

[0007]

The belt having the pouch according to PTL 2 does not require heat-pressing to fix pleats during the pouch production. It is necessary, however, to use a fabric, for the material of the pouch, that is stretchable in a direction intersecting the extending direction of the belt, which leads to an increase in the production cost as is the case for PTL 1.

[0008]

The present invention is made to provide a solution to the above problems. An object of the present invention is to provide a folding bag that can be produced by roll-folding a single rectangular sheet from end creases without using heat-pressing and that can be folded into a flat rectangular shape simply by stretching the folding bag in the usage state by pulling both ends thereof away from each other and also to provide a method of producing the folding bag.

Solution to Problem

[0009]

According to an aspect of the present invention, a folding bag that is roll-folded into a flat rectangular shape includes handle opening portions that are formed along respective short sides of a rectangular sheet and also includes end creases that are formed by folding the sheet along lines distant by an equal spacing from a symmetry axis that is a perpendicular bisector of long sides of the sheet in such a manner that the opposite handle opening portions abut each other, or are close to each other, at the symmetry axis. The end creases are positioned at both ends of the folded sheet. The folding bag also includes a storage portion that are formed by roll-folding the folded sheet at multiple roll-fold lines from both end creases toward the handle opening portions. The folding bag further includes respective bundled end portions that bundle and seal longitudinally opposite end portions of the roll-folded storage portion. In the folding bag, the storage portion is configured to be roll-folded from a usage state by stretching the storage portion by pulling the bundled end portions away from each other.

[0010]

According to an embodiment of the folding bag, the handle opening portions may have respective standing portions formed by bending the sheet along lines that are

distant, by a predetermined spacing, from corresponding short sides and are parallel thereto. The handle opening portions may have respective handles formed along the corresponding short sides. The handles may have respective hollow openings formed near the corresponding short side. In addition, the storage portion may have an inner pocket that is formed so as to be parallel to the handle opening portions.

[0011]

According to another aspect of the invention, a method of producing a folding bag that is roll-folded into a flat rectangular shape from a usage state by stretching the folding bag by pulling both end portions thereof away from each other includes a step of laying out a rectangular sheet having short sides and long sides. The method also includes a step of forming handle opening portions from the sheet along respective short sides and a step of forming end creases by folding the sheet upward along lines equidistant from a symmetry axis that is a perpendicular bisector of the long sides of the sheet in such a manner that the opposite handle opening portions abut each other, or are close to each other, at the symmetry axis. The end creases extending at both ends of the folded sheet so as to be parallel to the short sides. The method also includes a step of forming a storage portion by roll-folding the folded sheet at multiple

roll-fold lines from both end creases toward the handle opening portions. The method further includes a step of forming bundled end portions by sealing respective longitudinally opposite end portions of the folded storage portion.

[0012]

According to an embodiment of the method of producing the folding bag, the step of forming the handle opening portions may include a step of bending the sheet downward at lines parallel to respective short sides so as to allow necessary distances from the short sides for forming standing portions. The step of forming the handle opening portions may further include a step of forming handles along respective short sides. The step of forming the handles may include a step of forming hollow openings near respective short sides. The step of forming the storage portion may include a step of forming an inner pocket positioned so as to be parallel to the handle opening portions.

Advantageous Effects of Invention

[0013]

The folding bag of the present invention, which is configured as above, can be produced by providing a single rectangular sheet and roll-folding the sheet successively from the right and left end creases with the symmetry axis being as the center without using heat-pressing. When the

folding bag is carried, the storage portion can be roll-folded simply by stretching the storage portion in the usage state by pulling the bundled end portions away from each other.

[0014]

In addition, according to the method of producing the folding bag of the present invention, which is configured as above, a single rectangular sheet is laid out and subsequently roll-folded successively from the right and left end creases toward the handle opening portions with the symmetry axis being as the center. As a result, the folding bag can be produced without using heat-pressing, and the process of the production can be simplified.

Brief Description of Drawings

[0015]

[Figs. 1] Figs. 1 are views illustrating a folded state of a folding bag of a first example according to an embodiment of the present invention. Fig. 1(a) is a front view, and Fig. 1(b) is a schematic cross-sectional view of the folding bag taken along line X1-X1 and viewed in the direction of arrows X1 in Fig. 1(a).

[Fig. 2] Fig. 2 is a plan view illustrating a laid out state of a sheet to be used to produce the folding bag of the first example of the embodiment.

[Fig. 3] Fig. 3 is a perspective view illustrating a

step of folding the sheet of Fig. 2.

[Figs. 4] Figs. 4 are views illustrating states in which the sheet having been folded in the step of Fig. 3 is roll-folded. Fig. 4(a) is a perspective view illustrating a state of the sheet that is roll-folded twice, and Fig. 4(b) is a perspective view illustrating a state of the sheet that is roll-folded three times.

[Figs. 5] Figs. 5 are perspective views illustrating a step of finishing the folding bag of the first example of the embodiment. Fig. 5(a) illustrates a state in which side end portions are sewn together, respectively, and Fig. 5(b) illustrates a state in which tape-like members are sewn to respective side end portions.

[Fig. 6] Fig. 6 is a perspective view illustrating a usage state in which the folding bag of the first example of the embodiment is unfolded.

[Figs. 7] Figs. 7 are diagrams illustrating folding steps when the folding bag of the first example of the embodiment is folded. Fig. 7(a) illustrates a state in which the folding bag is stretched in a direction in which opposite bundled end portions are pulled apart, and Fig. 7(b) illustrates a state in which a storage portion having been folded in half are rolled up longitudinally.

[Fig. 8] Fig. 8 is a plan view illustrating a laid out state of a sheet to be used to produce a folding bag of a

second example of the embodiment.

[Fig. 9] Fig. 9 is a plan view illustrating a laid out state of a sheet to be used to produce a folding bag of a third example of the embodiment.

[Figs. 10] Figs. 10 are views illustrating the folding bag of the third example of the embodiment. Fig. 10(a) is a front view illustrating a folded state of the folding bag, and Fig. 10(b) is a perspective view illustrating a usage state in which the folding bag is unfolded.

[Figs. 11] Figs. 11 are views illustrating a folded state of a folding bag of a fourth example of the embodiment. Figs. 11(a) is a front view, and Fig. 11(b) is a schematic cross-sectional view of the folding bag taken along line X2-X2 and viewed in the direction of arrows X2 in Fig. 11(a).

[Fig. 12] Fig. 12 is a plan view illustrating a laid out state of a sheet to be used to produce the folding bag of the fourth example of the embodiment.

[Fig. 13] Fig. 13 is a perspective view illustrating a step of folding the sheet of Fig. 12.

Description of Embodiment

[0016]

A folding bag according to an embodiment of the present invention and a method of producing the folding bag will be described with reference to the drawings.

In the following description, the vertical direction of

the image in the front view of Fig. 1(a) corresponds to the up-down direction of the folding bag. Likewise, the lateral direction of the image corresponds to the right-left direction of the folding bag, and the direction perpendicular to the image corresponds to the front-rear direction of the folding bag.

Example 1

[0017]

In Figs. 1, reference signs A, B, C, D, and E denote a folding bag, a storage portion, bundled end portions, handle opening portions, and a band portion, respectively. The folding bag A is in a folded state, and the storage portion B is folded into a flat rectangular shape. The bundled end portions C seal longitudinally opposite end portions of the storage portion B, respectively, while each one of the longitudinally opposite end portions is bundled together. The handle opening portions D are disposed at the innermost part of the storage portion B, and storing items are put into or taken out of the storage portion B between the handle opening portions D. The band portion E is used to bundle the storage portion B when the storage portion B is longitudinally folded small.

[0018]

As illustrated in Fig. 2, the storage portion B and the handle opening portions D are formed from a single

rectangular sheet 1 that has the long sides 2 and the short sides 3. In the present example, the sheet 1 is made of nonelastic polyester fabric. The sheet 1, however, may be made of a natural or synthetic fabric of, for example, nylon or cotton or of a composite material made of such a fabric coated with synthetic resin. Any of these materials can be used for the sheet insofar as the sheet has a required strength and flexibility.

[0019]

Each of the handle opening portions D is formed from a laid-out sheet 1 by folding the sheet 1 downward (i.e., by making a mountain fold) at a mountain-fold line ML that is drawn parallel to a pair of the short sides 3 so as to have a predetermined spacing S1 from a corresponding short side 3. The predetermined spacing S1 is provided to form a standing portion f.

[0020]

In the present example, a V-shaped notch 4 is cut out from each handle opening portion D so as to extend inward from the corresponding short side 3. A handle 5 made of a tape having a width smaller than the spacing S1 is formed (sewn to the handle opening portion D) at the notch 4 near the short side 3. Each handle opening portion D is configured such that the standing portion f is formed by bending a portion of the sheet 1 along a line that is

parallel to the short side 3 and distant by the required spacing S1 from the short side 3. Accordingly, in the present example, it is not necessary to use a different member, other than the sheet 1, to form the standing portion f. The handle may be formed by appropriately processing a portion of the sheet 1 to be formed into the handle opening portion D, which will be described later in the second example.

[0021]

Next, the storage portion B is formed from the sheet 1 line symmetrically with respect to a symmetry axis CL, which is a perpendicular bisector of the long sides 2. To form the storage portion B, the sheet 1 is folded upward in the corresponding arrow direction (to make a valley fold) at each turn-around line FL that is drawn so as to have an equal spacing S2 both from the symmetry axis CL and from a corresponding mountain-fold line ML in such a manner that the standing portions f of respective handle opening portions D (which have been mountain-folded) oppose each other at the symmetry axis CL. As a result, as illustrated in Fig. 3, end creases 6 parallel to the symmetry axis CL are formed at both ends of the folded sheet 1. Here, the handle opening portions D that oppose each other preferably abut each other at the symmetry axis CL. It is sufficient, however, that the handle opening portions D at least come

close to each other.

[0022]

Next, the sheet 1 having the end creases 6 is roll-folded from both sides having respective end creases 6 toward the handle opening portions D, as indicated by the arrows in Fig. 3, at first roll-fold lines RL1 and subsequently at second roll-fold lines RL2.

[0023]

In the present example, each first roll-fold line RL1 is drawn on the sheet 1 having the end creases 6 at a position being distant by a roll width R1 from the end crease 6. Each second roll-fold line RL2 is drawn on the sheet 1 at a position being distant by a roll width R2 from the first roll-fold line RL1 and also being distant by a roll width R3 from the mountain-fold line ML. These roll widths gradually become larger so that the roll widths satisfy the relationship: $R1 < R2 < R3$.

[0024]

Here, the roll folding step of the sheet 1 having the end creases 6 is described more specifically. In the state illustrated in Fig. 3, the sheet 1 is roll-folded from both sides having the end creases 6 at each first roll-fold line RL1 and subsequently at each second roll-fold line RL2 as indicated by the arrows in Fig. 4(a). As a result, the sheet 1 is roll-folded so as to have the roll widths R3 at

both sides with respect to the symmetry axis CL.

[0025]

The sheet 1 having been roll-folded as illustrated in Fig. 4(a) is further folded at the mountain-fold lines ML with both sides coming upward. As a result, as illustrated in Fig. 4(b), the storage portion B is formed with the handle opening portions D disposed inside the folded storage portion B. In this state, the folded storage portion B has a flat rectangular shape that has an underside 7 formed along the symmetry axis CL, a pair of folded upper sides 8 formed along the second roll-fold lines RL2, and side end portions 9 formed so as to bundle respective longitudinally opposite ends of the folded storage portion B.

[0026]

In the present example, as illustrated in the schematic cross-sectional view of Fig. 1(b), each end crease 6 of the sheet 1 is roll-folded three times to form the storage portion B at the first roll-fold line RL1, the second roll-fold line RL2, and the mountain-fold line ML. In the roll folding step of the sheet 1, however, the number of folds may be increased or decreased depending on the size of the folding bag A.

[0027]

Next, the storage portion B folded as illustrated in Fig. 4(b) is sewn together as illustrated in Fig. 5(a) along

seams 10 of respective side end portions 9 formed at longitudinally opposite ends of the storage portion B. An end of a band portion E is also sewn to one of the side end portions 9 so that the band portion E extends outward from a central part of the side end portion 9. The band portion E is formed of a ring-like rubber band for binding the storage portion B that is further folded longitudinally.

[0028]

In the present example, the band portion E is formed of the ring-like rubber band. The band portion E, however, is not limited to this type but may be, for example, a band strip having a button at an end. The band strip is fixed to the side end portion 9 while a button-receiving portion is formed on the surface of the storage portion B.

[0029]

As illustrated in Fig. 5(b), bundled end portions C are formed of a pair of respective tape-like members 11. Each tape-like member 11 has a length a little more than twice as long as a roll width R3, which is the width of the folded storage portion B. The tape-like member 11 seals the corresponding side end portion 9 of the storage portion B in the folded manner. The tape-like member 11 is folded at a crease 12 and sewn to the side end portion 9 of the folded storage portion B so as to bind the side end portion 9.

[0030]

As described above, the folding bag A is produced as in the folded state. The following describes the external appearance of the folding bag A with reference to Fig. 6 when the folding bag A is used.

[0031]

In the usage state, the folding bag A is unfolded such that the entire shape looks like a shoulder bag. The unfolded folding bag A has the underside 7 having a width of approximately twice as wide as the roll width R3 (which is the distance between the symmetry axis CL and each folded upper side 8). The unfolded folding bag A also has a body 13 that rises from the front and rear edges of the underside 7. The body 13 has the front and rear end creases 6 in the middle thereof. The unfolded folding bag A also has upper gussets 14 that extend upward from the body 13 to respective handle opening portions D to which the handles 5 are connected. The notches 4 are formed in the upper gussets 14.

[0032]

Next, operation and advantageous effects of the present example will be described with reference to the drawings.

As described above, the folding bag A of the present example is produced as in the folded state illustrated in Fig. 1 by roll-folding the rectangular laid-out sheet 1 illustrated in Fig. 2. The following describes a procedure of changing the state of the folding bag A into the usable

state.

[0033]

The storage portion B of the folding bag A is bound together by the rubber-made band portion E. First, a user removes the band portion E from the storage portion B and unfolds the folding bag A in the right-left direction with the underside 7 facing downward as illustrated in Fig. 1(a). In this state, the underside 7 of the storage portion B is closed, while the folded upper sides 8 are separable in the front-rear direction as illustrated in the schematic cross-sectional view of Fig. 1(b).

[0034]

Subsequently, the user opens the folded upper sides 8 in the front-rear direction and pulls the handles 5 sewn to the handle opening portions D upward out of the storage portion B while pulling the underside 7 downward. The folding bag A thereby assumes the usable state as illustrated in Fig. 6. The user puts a storing item in between the handle opening portions D and uses the folding bag A while holding the handles 5 by hand or hanging it from the shoulder. Here, the bundled end portions C are hidden by portions of the body 13, such as the folded upper sides 8, of the folding bag A, which improves the external appearance as a bag.

[0035]

Next, a procedure of folding the folding bag A small after use will be described with reference to Figs. 7. In the state illustrated in Fig. 6, the storing item is taken out from the folding bag A with the handle opening portions D being full open. Subsequently, the user pulls the bundled end portions C, which are formed at both ends of the storage portion B, by hand in directions away from each other (in the arrow directions) as illustrated in Fig. 7(a). In case of failure in folding the folding bag A neatly, the user may pull the bundled end portions C again. Consequently, the storage portion B is folded into the flat rectangular shape.

[0036]

Subsequently, as illustrated in Fig. 7(b), the storage portion B is folded longitudinally in half at a crease 15 and is further folded small from the crease 15. Folding of the folding bag A is completed with the folding bag A being bundled with the rubber-made band portion E.

[0037]

As described above, the folding bag A of the present example can be produced by providing a single rectangular sheet 1 and by roll-folding the sheet 1 from the right and left end creases 6 with the symmetry axis CL being as the center. Accordingly, the storage portion B can be produced simply and easily while eliminating a pleats fixation step using heat-pressing.

Example 2

[0038]

Next, a second example will be described. The second example is obtained by changing the configuration of the handles 5 of the first example.

The elements same as those of the first example will be denoted by the same reference signs, and the description will focus on different elements, which will be denoted by different reference signs.

[0039]

In Fig. 8, reference sign 21 denotes a rectangular sheet having long sides 22 and short sides 23. The storage portion B and the handle opening portions D of the folding bag A illustrated in Fig. 1 are formed from the sheet 21. Compared with the sheet 1 of the first example, although the short sides 23 of the sheet 21 have the same length as those of the sheet 1, the long sides 22 of the sheet 21 are made longer, by spacings S3, than the long sides 2 of the sheet 1. The spacings S3 are provided at respective upper and lower portions of the sheet 21.

[0040]

Semi-elliptic hollow openings 24 are formed in the laid-out sheet 21 near a pair of respective short sides 23. In the sheet 21, handles 25 are formed by making valley folds at respective valley-fold lines VL that are drawn

parallel to the short sides 23 and are spaced by a predetermined spacing S3 from corresponding short sides 23. More specifically, the sheet 21 is folded at each valley-fold line VL in such a manner that each short side 23 comes to a corresponding overlap line OL that is drawn on the sheet 21 so as to be in contact with the straight edge of the hollow opening 24. Each handle 25 is subsequently formed by sewing the overlapped portions of the sheet 21 together. In the present example, each hollow opening 24 is reinforced by a reinforcing tape 26 sewn to the sheet 21 around the hollow opening 24.

[0041]

Next, operation and advantageous effects of the present example will be described with reference to the drawings.

In the present example, the folding bag A is produced as in the folded state illustrated in Fig. 1 by roll-folding the rectangular laid-out sheet 21 illustrated in Fig. 8, as is the case for the first example. The handles 25 formed in the handle opening portions D, however, are different from the handles 5 of the first example, which is described further below.

[0042]

In the present example, as described above, the hollow openings 24 are cut out near the short sides 23 from the rectangular laid-out sheet 21 of Fig. 8. Subsequently, the

sheet 21 is valley-folded at each valley-fold line VL spaced by the spacing S3 from the corresponding short side 23 in such a manner that the short side 23 comes to the overlap line OL, and the overlapped portions are sewn together to form each handle 25.

[0043]

In the sheet 21, each standing portion f is formed, after forming the handle 25, by bending the sheet 21 downward at the mountain-fold line ML that is drawn parallel to the corresponding short side 23 and spaced therefrom by the predetermined spacing S1, as is the case for the handle opening portion D illustrated in Fig. 3. Subsequently, the folding bag A is produced through the same steps as those described in the first example illustrated in Figs. 3 to 5.

[0044]

In the present example, as described above, the handles 25 can be formed in respective handle opening portions D by providing the single rectangular sheet 21, by cutting out the hollow openings 24 from the sheet 21 near respective short sides 23, and by sewing the overlapped portions together.

Example 3

[0045]

Next, a third example will be described. The third example is obtained by changing the configurations of the

storage portion B and the band portion E of the first example.

The elements same as those of the first example will be denoted by the same reference signs, and the description will focus on different elements, which will be denoted by different reference signs.

[0046]

In Fig. 10(a), reference signs Aa, Ba, C, D, and Ea denote a folding bag, a storage portion, the bundled end portions, the handle opening portions, and a band portion, respectively. The folding bag Aa is in a folded state, and the storage portion Ba is folded into a flat rectangular shape. The bundled end portions C seal longitudinally opposite end portions of the storage portion Ba, respectively, while each one of the longitudinally opposite end portions is bundled together. The handle opening portions D are disposed at the innermost part of the storage portion Ba, and a storing item 29 is put into or taken out of the storage portion Ba between the handle opening portions D (see Fig. 10(b)). The band portion Ea is used to bundle the storage portion Ba when the storage portion Ba is longitudinally folded small. In the present example, the band portion Ea is disposed differently from the first example, in other words, disposed at a bundled end portion C near the storage portion Ba. The band portion Ea, however,

may be disposed differently, as is in the storage portion B of Fig. 7(b), insofar as the band portion Ea is able to bind the longitudinally folded storage portion Ba.

[0047]

In Fig. 9, reference sign 1 denotes the rectangular sheet having the long sides 2 and the short sides 3, and the storage portion Ba and the handle opening portions D of the folding bag Aa of Figs. 10 are formed from the rectangular sheet 1. In the present example, the V-shaped notch 4 is cut out from each handle opening portion D so as to extend inward from the corresponding short side 3. The handle 5 made of a tape having a width smaller than the spacing S1 is sewn to the handle opening portion D at the notch 4 near the short side 3.

[0048]

An inner pocket P is formed on the laid-out sheet 1 by sewing an additional sheet 27 to the sheet 1 along seams 28 in such a manner that the upper end of the additional sheet 27 comes into contact with the tip end of the notch 4. In the present example, the additional sheet 27 for forming the inner pocket P is sized such that the lateral dimension is equal to the length of the short side 3 and the vertical dimension is longer, by margins for seams, than the depth d of the inner pocket P. However, the size of the additional sheet 27 for forming the inner pocket P may be selected

appropriately in accordance with a width w and a depth d of a required inner pocket P .

[0049]

Next, operation and advantageous effects of the present example will be described with reference to the drawings.

In the present example, the folding bag Aa is produced as in the folded state illustrated in Fig. 10(a) by roll-folding the rectangular laid-out sheet 1 illustrated in Fig. 9, as is the case for the first example. The storage portion Ba , however, is different from the storage portion B of the first example in that the inner pocket P is formed inside the storage portion Ba , which is described further below.

[0050]

In the present example, as illustrated in Fig. 9, the additional sheet 27 is disposed on the rectangular laid-out sheet 1 in such a manner that the upper end of the additional sheet 27 comes to the tip end of the corresponding notch 4 formed in the sheet 1. The additional sheet 27 is sewn to the sheet 1 along the seams 28 to form the inner pocket P , which comes in the inside of the storage portion Ba . The width w of the inner pocket P can be changed appropriately by changing the positions of the seams 28 along which the inner pocket P is sewn.

[0051]

In the sheet 1, each standing portion f is formed, after forming the inner pocket P, by bending the sheet 1 downward at the mountain-fold line ML that is drawn parallel to the corresponding short side 3 and spaced therefrom by the predetermined spacing S1, as is the case for the handle opening portion D illustrated in Fig. 3. Subsequently, the folding bag Aa is produced through the same steps as those described in the first example illustrated in Figs. 3 to 5. [0052]

The folding bag Aa is produced as in the folded state. The following describes the external appearance of the folding bag Aa with reference to Fig. 10(b) when the folding bag Aa is used. In the usage state, the folding bag Aa is unfolded. A storing item 29, such as a lunch box, is stored in the storage portion Ba between the handle opening portions D. A beverage bottle 30 or the like can be stored in the inner pocket P formed inside the storage portion Ba, as if the beverage bottle 30 were hung in a hammock, at a position away from the storing item 29. [0053]

In the present example, as described above, the inner pocket P is formed inside the storage portion Ba by sewing the additional sheet 27 to the single rectangular sheet 1 that forms the storage portion Ba and the handle opening portions D of the folding bag Aa. Accordingly, the beverage

bottle 30 or the like can be stored in the inner pocket P so as to be kept distant from the storing item 29 such as the lunch box stored at the bottom of the storage portion Ba. This enables a warm storing item 29 and a cold bottle 30 to be kept away from each other without coming into contact. In addition, this reduces the likelihood of the bottle 30 squashing the storing item 29.

Example 4

[0054]

Next, a fourth example will be described. The fourth example is obtained by changing the configuration of the handle opening portions D of the first example.

The elements same as those of the first example will be denoted by the same reference signs, and the description will focus on different elements, which will be denoted by different reference signs.

[0055]

In Figs. 11, reference signs Ab, Bb, C, Da, Ea, and 35 denote a folding bag, a storage portion, the bundled end portions, handle opening portions, a band portion, and a handle, respectively. The folding bag Ab is in a folded state, and the storage portion Bb is folded into a flat rectangular shape. The bundled end portions C seal respective longitudinally opposite end portions of the storage portion Bb while each of the longitudinally opposite

end portions is bundled together. The handle opening portions Da are disposed at the innermost part of the storage portion Bb, and storing items are put into or taken out of the storage portion Bb between the handle opening portions Da. The band portion Ea is used to bundle the storage portion Bb when the storage portion Bb is longitudinally folded small. The handle 35 is formed at the handle opening portions Da.

[0056]

As illustrated in Fig. 12, the storage portion Bb and the handle opening portions Da are formed from a single rectangular sheet 31 having long sides 32 and short sides 33. Compared with the sheet 1 of the first example, the short sides 33 of the sheet 31 have the same length as those of the sheet 1, but the long sides 32 of the sheet 31 are made longer, by about roll widths R0, than the long sides 2 of the sheet 1. The roll widths R0 are provided at the right and left ends of the folded sheet 31 illustrated in Fig. 13.

[0057]

The storage portion Bb is formed from the laid-out sheet 31 line symmetrically with respect to the symmetry axis CL, which is the perpendicular bisector of the long sides 32. To form the storage portion Bb, the sheet 31 is folded upward in the corresponding arrow direction (to make a valley fold) at each turn-around line FLa that is drawn so

as to have an equal spacing S4 both from the symmetry axis CL and from a corresponding short side 33 in such a manner that the handle opening portions Da formed along a pair of respective short sides 33 oppose each other at the symmetry axis CL. As a result, as illustrated in Fig. 13, end creases 36 parallel to the symmetry axis CL are formed at both ends of the folded sheet 31. Here, the handle opening portions Da that oppose each other at the symmetry axis CL are desirably positioned as close to each other as possible.

[0058]

Next, the handle 35, which is formed of a tape-like member, is sewn to the handle opening portions Da that oppose each other at the symmetry axis CL so as to link respective central portions of the short sides 33 to each other. Subsequently, as indicated by the arrows in Fig. 13, the sheet 31 having the end creases 36 is roll-folded from both sides of the sheet 31 having respective end creases 36 toward the handle opening portions Da successively at first roll-fold lines RL1, at second roll-fold lines RL2, and at third roll-fold lines RL3.

[0059]

In the present example, each first roll-fold line RL1 is drawn on the sheet 31 at a position being distant by a roll width R0 from the end crease 36. Each second roll-fold line RL2 is drawn on the sheet 31 at a position being

distant by a roll width R1 from the first roll-fold line RL1. Each third roll-fold line RL3 is drawn on the sheet 31 at a position being distant by a roll width R2 from the second roll-fold line RL2 and also being distant by a roll width R3 from the short side 33. These roll widths gradually become larger so that the roll widths satisfy the relationship: $R0 < R1 < R2 < R3$.

[0060]

In the state illustrated in Fig. 13, as indicated by the arrows, the sheet 31 is roll-folded from both sides having the end creases 36 successively at each first roll-fold line RL1, at each second roll-fold line RL2, and at each third roll-fold line RL3. As a result, the sheet 31 is roll-folded so as to have the roll widths R3 at both sides with respect to the symmetry axis CL. In the sheet 31 roll-folded through the above steps, the storage portion Bb is folded such that the handle opening portions Da are hidden at the bottom of the storage portion Bb as illustrated in the schematic cross-sectional view of Fig. 11(b). In this state, as illustrated in Fig. 11(a), the folded storage portion Bb has a flat rectangular shape that has an underside 37 formed along the symmetry axis CL, a pair of folded upper sides 38 formed along the third roll-fold lines RL3, and the bundled end portions C formed so as to bundle respective longitudinally opposite end portions of the

folded storage portion Bb.

[0061]

In the present example, as illustrated in Fig. 11(b), each end crease 36 of the sheet 31 is roll-folded three times to form the storage portion Bb at the first roll-fold line RL1, the second roll-fold line RL2, and the third roll-fold line RL3. In the roll folding step of the sheet 31, however, the number of folds may be increased or decreased depending on the size of the folding bag Ab.

[0062]

Next, operation and advantageous effects of the present example will be described with reference to the drawings.

To produce the folding bag Ab of the present example, as is the case for the first example, the rectangular laid-out sheet 31 illustrated in Fig. 12 is first folded at each turn-around line Fla that is drawn at a position distant by an equal spacing S4 both from the symmetry axis CL and from the short side 33, and subsequently the folded sheet 31 is further roll-folded into the folding bag Ab. Accordingly, the folding bag Ab is produced in the folded state as illustrated in Fig. 11. The handle opening portions Da and the handle 35, however, are different from the handle opening portions D and the handles 5 of the first example. The following describes a procedure of changing the state of the folded folding bag Ab into the usable state.

[0063]

The storage portion Bb is bound together by the band portion Ea as is the case for the first example. First, a user removes the band portion Ea from the storage portion Bb and unfolds the storage portion Bb in the right-left direction with the underside 37 facing downward as illustrated in Fig. 11(a). In this state, the underside 37 of the storage portion Bb is closed, while the folded upper sides 38 are separable in the front-rear direction as illustrated in the schematic cross-sectional view of Fig. 11(b).

[0064]

Subsequently, the user opens the folded upper sides 38 in the front-rear direction and pulls up the handle 35 that is sewn to the handle opening portions Da of the storage portion Bb while pulling the underside 37 downward. The folding bag Ab thereby assumes the usable state. The user puts a storing item in between the handle opening portions Da and uses the folding bag Ab while holding the handles 35 by hand or hanging it from the shoulder.

[0065]

Next, a procedure of folding the folding bag Ab after use will be described. In the usage state, the storing item is first taken out from the folding bag Ab with the handle opening portions Da being full open. Subsequently, the user

pulls the bundled end portions C, which are formed at both ends of the storage portion Bb, by hand in directions away from each other. As a result, the storage portion Bb is roll-folded neatly into the flat rectangular shape as illustrated in Fig. 11(a).

[0066]

As described above, the folding bag Ab of the present example is produced without forming the standing portions f at the handle opening portions Da. The folding bag Ab is produced by providing the single rectangular sheet 31 and by roll-folding the sheet 31 successively from the right and left end creases 36 with the symmetry axis CL being as the center while the handle opening portions Da formed along a pair of respective short sides 33 oppose each other. After use, the storage portion Bb can be roll-folded easily, compared with the first example having the standing portions f, by stretching the storage portion Bb by pulling the bundled end portions C formed at both end portions of the storage portion Bb in directions away from each other. The storage portion Bb can be folded neatly with one try.

[0067]

In the folding bag Ab of the present example, the handle 35 is formed so as to link the handle opening portions Da that oppose at the symmetry axis CL. Accordingly, when in use, the handle opening portions Da,

which have been folded at the bottom of the storage portion Bb, can be unfolded easily by pulling up the handle 35 from the folded state.

Industrial Applicability

[0068]

When the folding bag of the present invention is used, the body hides the bundled end portions, which improves the external appearance as a bag. In addition, the storage portion can be folded into the flat rectangular shape from the usage state simply by stretching the storage portion by pulling the bundled end portions away from each other. The folding bag of the present invention is easily foldable and portable, which is suitable, for example, as a reusable shopping bag for storing purchased goods.

Reference Signs List

[0069]

A, Aa, Ab folding bag
B, Ba, Bb storage portion
C bundled end portion
D, Da handle opening portion
E, Ea band portion
CL symmetry axis (center line)
FL, FLa turn-around line
ML mountain-fold line
OL overlap line

P inner pocket
RL1, RL2, RL3 roll-fold line
R0, R1, R2, R3 roll width
S1, S2, S3, S4 spacing
VL valley-fold line
d depth
f standing portion
w width
1, 21, 31 sheet
2, 22, 32 long side
3, 23, 33 short side
4 notch
5, 25, 35 handle
6, 36 end crease
7, 37 underside
8, 38 folded upper side
9 side end portion
10, 28 seam
11 tape-like member
12, 15 crease
13 body
14 upper gusset
24 hollow opening
26 reinforcing tape
27 additional sheet

29 storing item

30 bottle

CLAIMS

1. A folding bag foldable into a flat rectangular shape, the folding bag comprising:

handle opening portions that are formed along respective short sides of a rectangular sheet;

end creases that are formed by folding the sheet along lines distant by an equal spacing from a symmetry axis that is a perpendicular bisector of long sides of the sheet in such a manner that the opposite handle opening portions abut each other, or are close to each other, at the symmetry axis and the end creases are positioned at both ends of the folded sheet;

a storage portion that are formed by roll-folding the folded sheet at multiple roll-fold lines from both end creases toward the handle opening portions; and

bundled end portions that bundle and seal respective longitudinally opposite end portions of the roll-folded storage portion, wherein

the storage portion is configured to be roll-folded from a usage state by stretching the storage portion by pulling the bundled end portions away from each other.

2. The folding bag according to Claim 1, wherein

the handle opening portions have respective standing portions formed by bending the sheet along lines that are

distant, by a predetermined spacing, from corresponding short sides and are parallel thereto.

3. The folding bag according to Claim 1 or 2, wherein
the handle opening portions have respective handles formed along the corresponding short sides.

4. The folding bag according to Claim 3, wherein
the handles have respective hollow openings formed near the corresponding short side.

5. The folding bag according to any one of Claims 1 to 4, wherein
the storage portion has an inner pocket that is formed so as to be parallel to the handle opening portions.

6. A method of producing a folding bag that is roll-folded into a flat rectangular shape from a usage state by stretching the folding bag by pulling both end portions thereof away from each other, the method comprising:

a step of laying out a rectangular sheet having short sides and long sides;

a step of forming handle opening portions from the sheet along respective short sides;

a step of forming end creases by folding the sheet

upward along lines equidistant from a symmetry axis that is a perpendicular bisector of the long sides of the sheet in such a manner that the opposite handle opening portions abut each other, or are close to each other, at the symmetry axis, the end creases extending at both ends of the folded sheet so as to be parallel to the short sides;

a step of forming a storage portion by roll-folding the folded sheet at multiple roll-fold lines from both end creases toward the handle opening portions; and

a step of forming bundled end portions by sealing respective longitudinally opposite end portions of the folded storage portion.

7. The method of producing the folding bag according to Claim 6, wherein

the step of forming the handle opening portions includes a step of bending the sheet downward at lines parallel to respective short sides so as to allow necessary distances from the short sides for forming standing portions.

8. The method of producing the folding bag according to Claim 6 or 7, wherein

the step of forming the handle opening portions further includes a step of forming handles along respective short sides.

9. The method of producing the folding bag according to Claim 8, wherein

the step of forming the handles includes a step of forming hollow openings near respective short sides.

10. The method of producing the folding bag according to any one of Claims 6 to 9, wherein

the step of forming the storage portion includes a step of forming an inner pocket positioned so as to be parallel to the handle opening portions.