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(54) **Tool storage bag**

(57) A tool storage bag (1) includes a hexahedral fabric bag body (2) openable only at a top side (2A) or at the top side (2A) and a bottom side (2F), and an interlining material at least provided at three adjoining sides of the bag body (2). The interlining material includes plural flat plates (3A) to (3C) corresponding to the three sides (2A), (2B), B1 (S1, S2). At least one of the flat plates (3A) to (3C) is detachable from a corresponding one of the sides

B1 (S1, S2) of the bag body (2), while the bag body (2) is foldable without folding the sides (2A), (2B) provided with the interlining material. The bag body (2) with at least one flat plate detached from the corresponding side is folded down by overlapping, on one (2B) of the unfoldable sides of the bag body (2), the side (2A) other than the above one side and provided with the interlining material.

## Description

### BACKGROUND OF THE INVENTION

#### TECHNICAL FIELD

**[0001]** The present invention relates to a tool storage bag including a bag body for storing electric tools and an interlining material for preventing the deformation of the bag body.

#### BACKGROUND ART

**[0002]** A design patent publication No. 1375208, for example, discloses a tool bag formed of a thick fabric and used for carrying therein a variety of tools. More recently, fabric bags have been widely used as tool storage bags because the fabric bags are lighter in weight and easier to handle as compared with plastic bags and synthetic resin bags.

**[0003]** The fabric tool storage bags are required to be foldable to reduce a storage space so that a large number of the bags can be transported when electric tools are not therein.

**[0004]** However, the conventional fabric tool storage bags have been unfoldable because the interlining material employed for preventing the bag deformation interferes with folding the bags.

#### SUMMARY OF THE INVENTION

**[0005]** In view of the above problem, it is an object of the present invention to provide a tool storage bag that is foldable despite the use of the interlining material.

**[0006]** According to a first aspect of the invention, there is provided a tool storage bag including a hexahedral fabric bag body which is openable only at a top side or at the top side and a bottom side and an interlining material at least provided at three adjoining sides of the bag body. The interlining material comprises plural flat plates corresponding to the three sides and at least one of the flat plates are detachable from a corresponding one of the sides of the bag body. The bag body can be folded down without folding the sides provided with the interlining material, and is folded by overlapping a side having the interlining material on one of the unfoldable sides of the bag body in a condition where the at least one of the flat plate is detached from the bag body. The phrase "at least one of the flat plates are detached from a corresponding one of the sides of the bag body" means that at least one flat plate is out of contact with the side of the bag body, or is defined to include both a state where at least one flat plate is removed from the bag body and a state where at least one flat plate is accommodated in the bag body as held out of contact with the side of the bag body.

**[0007]** According to a second aspect of the invention, there is provided a tool storage bag of the first aspect

wherein the bag body can be folded down by removing the at least one detached flat plate from the bag body and overlapping the other side on one of the unfoldable sides.

5 **[0008]** According to a third aspect of the invention, there is provided a tool storage bag of the first or second aspect wherein the three adjoining sides are a back side, the top side and an inner bottom surface of the bag body or the back side, the top side and either one of inner right-side and left-side surfaces of the bag body, wherein the flat plate as the interlining material is incorporated in the back side and the top side, respectively, wherein an inner body combining three flat plates including the one detachable flat plate is provided in correspondence to the inner bottom surface and the inner right-side and left-side surfaces, wherein the inner body is supported in the bag body in conformity to the inner bottom surface and the inner right-side and left-side surfaces and is detachable from each of the inner bottom surface and the inner right-side and left-side surfaces, and wherein removing the inner body from the bag body allows the bag body to be folded down by overlapping the top side on the back side as the unfoldable side.

10 **[0009]** According to a fourth aspect of the invention, there is provided a tool storage bag of the first aspect wherein the interlining material can be folded down in the bag body by overlapping the at least one detached flat plate on one of the flat plates that is united with a corresponding unfoldable side, and the bag body with the interlining material folded therein can be folded down.

15 **[0010]** According to the first aspect of the invention, the tool storage bag can be folded down by folding inside the bag body while simultaneously overlapping the other side provided with the interlining material on the unfoldable side of the bag body.

20 **[0011]** According to the second aspect of the invention, the tool storage bag can be folded down by taking out the at least one detached flat plate from the bag body to thereby remove the flat plate (interlining material) from the side other than the unfoldable side of the bag body, followed by overlapping, on the unfoldable side, the other side including the interlining material.

25 **[0012]** According to the third aspect of the invention, the removal of the inner body from the bag body to thereby remove the flat plates (interlining material) from the lateral sides and bottom side of the bag body allows the top side of the bag body to be overlapped on the back side of the bag body while simultaneously folding inside the lateral sides and bottom side, the top side incorporating therein the flat plate. As a result, the tool storage bag can be folded down.

30 **[0013]** According to the fourth aspect of the invention, the flat plate (interlining material) can be removed from the side other than the unfoldable side of the bag body when the at least one flat plate is overlapped on the flat plate united with the unfoldable side of the bag body. Consequently, the other sides, from the interlining material are removed, can be folded, and then the tool storage

bag can be folded down.

## BRIEF DESCRIPTION OF THE DRAWINGS

### [0014]

Fig. 1A is a general perspective view showing a tool storage bag according to a first embodiment of the invention.

Fig. 1B is a perspective view showing a stiffener removable from the inside of the above tool storage bag.

Fig. 1C is a diagram showing how flat plates forming the above stiffener are connected together as allowed to be folded on a respective edge thereof as a pivot axis.

Fig.2A is a first explanatory diagram showing the tool storage bag being folded after the removal of the above stiffener from the inside of the bag body thereof.

Fig.2B is a second explanatory diagram showing the above bag being folded down as seen diagonally from below.

Fig.2C is a third explanatory diagram showing the folded tool storage bag.

Fig.3A is a general perspective view showing a tool storage bag according to a second embodiment of the invention.

Fig.3B is an explanatory diagram showing a bag body of the above tool storage bag, which is being folded.

Fig.3C is an explanatory diagram showing a stiffener of the above tool storage bag, which is being folded.

Fig.3D is a diagram showing the above tool storage bag folded down by folding the above stiffener in the bag body.

Fig.4A is a general perspective view showing a tool storage bag according to a third embodiment of the invention.

Fig.4B is an explanatory diagram showing a bag body of the above tool storage bag, which is being folded by pressing.

Fig.4C is an explanatory diagram showing a stiffener of the above tool storage bag, which is being folded.

Fig.4D is a diagram showing the above tool storage bag folded down by folding the stiffener in the above bag body.

Fig.5A is a general perspective view showing a tool storage bag according to a fourth embodiment of the invention.

Fig.5B is an explanatory diagram showing a bag body of the above tool storage bag, which is being folded.

Fig.5C is an explanatory diagram showing a stiffener of the above tool storage bag, which is being folded.

Fig.5D is a diagram showing the above tool storage bag folded down by folding the above stiffener in the above bag body.

Fig.6A is a general perspective view showing a tool storage bag according to a fifth embodiment of the invention.

Fig.6B is an explanatory diagram showing a bag body of the above tool storage bag, which is being folded.

Fig.6C is an explanatory diagram showing a stiffener of the above tool storage bag, which is being folded.

Fig.6D is a diagram showing the above tool storage bag folded down by folding the above stiffener in the above bag body.

Fig.7A is a front view showing two tool storage bags adapted for portability by being stacked on top of each other.

Fig.7B is a side view showing the two tool storage bags adapted for portability by being stacked on top of each other.

## DESCRIPTION OF PREFERRED EMBODIMENTS

<First Embodiment>

**[0015]** A first embodiment of the invention is described with reference to Fig. 1A to Fig.1C and Fig.2A to Fig.2C.

A tool storage bag 1 shown in Fig. 1A is designed to store therein electric tools such as an impact driver and is formed of a foldable fabric material. The tool storage bag 1 includes a bag body 2 and a stiffener 3.

**[0016]** The bag body 2 is a hexahedral body having a substantially regular tetragonal bottom and formed by suitably sewing foldable fabric pieces together. A top side 2A of the bag body 2 is sewn to an upper edge of a back side 2B so as to be supported by the back side 2B in a manner to be rotatable about the upper edge in a vertical direction of the bag body 2. That is, the top side can open or close a top side portion of the bag body 2. An electric tool is accommodated in the bag body 2 through an upper opening H thereof. In the bag body 2 of this embodiment, an interlining material is enclosed in the top side 2A, the back side 2B and a front side 2C, respectively. Thus, the individual sides 2A to 2C incorporate therein the interlining material. In this embodiment, the interlining material enclosed in the respective sides 2A to 2C is a flat plate formed of cardboard.

**[0017]** Indicated at 3 is the stiffener which is removably provided in the bag body 2 in conformity to a left side 2D, a right side 2E and a bottom side 2F thereof so as to stiffen the bag body 2 and prevent the deformation of the bag body 2. As shown in Fig.1B, the stiffener 3 includes three flat plates 3A to 3C combined into one body shaped like an inverted gate as seen from front. The stiffener is disposed in the bag body 2 in contact with an inner bottom surface B 1, an inner left-side surface S 1 and an inner right-side surface S2 (all of which are shown in Fig.2A) of the bag body 2. Specifically, the flat plate 3B stands upright on a left-side edge L1 of the flat plate 3A of the stiffener and is connected thereto in a manner to be rotatable toward the flat plate 3A. On the other hand, the

flat plate 3C stands upright on a right-side edge L2 of the flat plate 3A and is connected thereto in a manner to be rotatable toward the flat plate 3A, as indicated by an arrow in the figure. According to this embodiment, the individual flat plates 3A to 3C are formed of cardboard. The stiffener 3 is an example of "a inner body combining three flat plates" according to the invention.

**[0018]** Before the tool storage bag 1 is folded down, as shown in Fig. 1A, the stiffener 3 is disposed in the bag body 2 while the individual sides 3A to 3C thereof are in conformity to and supported by the inner bottom surface B1, the inner left-side surface S1 and the inner right-side surface S2 of the bag body 2, respectively (see Fig. 2A). As a result, the back side 2B and its adjoining top side 2A and the front side 2C are each provided with the interlining material and besides, the inner bottom surface B1 and its adjoining inner right-side and left-side surfaces S1, S2 are provided with the interlining material as the stiffener. It is noted that the sides 2A, 2B and B1, the sides 2A, 2B and S1 or the sides 2A, 2B and S2 are an example of "the three adjoining sides" according to the invention.

**[0019]** The tool storage bag 1 according to the embodiment may be folded down as follows. As shown in Fig. 1C, a user may take out the stiffener 3 from the bag body 2 through the opening H by pulling up the flat plates 3B, 3C of the stiffener 3. In other words, the flat plates 3A to 3C can be removed from the left side 2D, the right side 2E and the bottom side 2F of the bag body 2, as shown in Fig. 2A. The flat plates 3A to 3C can be removed by separating the flat plates 3A to 3C from their adjoining back side 2B incorporating the interlining material (flat plate), followed by taking them out of the bag body 2. It should be noted that the interlining material (flat plates) incorporated in the top side 2A, the back side 2B and the flat plate 3A, the interlining material (flat plates) incorporated in the above-described sides and the flat plate 3B, and the interlining material (flat plates) incorporated in the above-described sides and the flat plate 3C are examples of "the plural flat plates" according to the invention. Further, each of the flat plates 3A to 3C is an example of "the one flat plate" according to the invention.

**[0020]** Subsequently, the top side 2A is rotated about the upper edge of the back side 2B and toward the back side 2B, as indicated by an arrow in the figure, so as to be overlapped on an outer surface of the back side 2B, as shown in Fig. 2A and Fig. 2B. Then, folding is made on the vertical line of each left and right sides 2D, 2E toward the inside of the bag body 2, as indicated by an arrow in the figure, causes the front side 2C sewn to the opposite lateral sides 2D, 2E to be drawn to the inside of the bag body 2, as shown in Fig. 2C. As shown in Fig. 2B, on the other hand, the bottom side 2F is folded along plural creases and toward the inside of the bag body as indicated by arrows in the figure. Accordingly, the front side 2C is overlapped on an inner surface of the back side 2B as pressing the lateral sides 2D, 2E and the bottom side 2F against the inner surface of the back side 2B, while

the lateral sides 2D, 2E are valley folded to the inside and the bottom side 2F folded inside. In this manner, the tool storage bag 1 according to the embodiment of the invention permits the bag body 2 to be folded into a substantially flat configuration by overlapping the top side 2A and the front side 2C on the back side 2B instead of folding the top side 2A, the back side 2B and the front side 2C.

**[0021]** When not accommodating the electric tools therein, the tool storage bag 1 of this embodiment can be folded down, providing for the reduction of storage space. In the case of transportation, on the other hand, the tool storage bag 1 of this embodiment takes up less space than unfoldable tool storage bags, so that the tool storage bag of this embodiment can be transported in large number at a time. It should be noted that each of the top side 2A, the back side 2B and the front side 2C is an example of "the unfoldable side" according to the invention. Further, the back side 2B is an example of "one of the unfoldable sides" according to the invention while the top side 2A is an example of "the other side provided with the interlining material" according to the invention.

<Effects of the First Embodiment>

**[0022]** In the tool storage bag 1 according to the embodiment of the invention, as described above, the stiffener 3 is detached from the inner bottom surface B1 and the inner lateral-side surfaces S1, S2 and taken out of the bag body 2. Then, the bag body 2 can be folded down by overlapping the top side 2A and the front side 2C on the back side 2B from which its adjoining flat plates 3A to 3C are separated. The top and front sides incorporate therein the interlining material (flat plates), while the back side incorporates therein the interlining material (flat plate). After the removal of the flat plates 3A to 3C from the opposite lateral sides 2D, 2E and the bottom side 2F of the bag body 2, the individual sides 2A, 2C incorporating therein the interlining material (flat plates) can be overlapped on the back side 2B while folding the individual sides 2D to 2F toward the inside of the bag body 2. Accordingly, the tool storage bag 1 can be folded down.

<Second Embodiment>

**[0023]** A second embodiment of the invention is described with reference to Fig. 3. In this embodiment, a similar structure to that of the first embodiment is described briefly. Like reference characters refer to the corresponding components of the first embodiment and the description thereof is dispensed with. A tool storage bag 1A includes a bag body 10 and a stiffener 15. In the tool storage bag 1 of the first embodiment, the flat plates (interlining material) are provided in correspondence to the sides 2A to 2F defining the six sides of the bag body 2. In the tool storage bag 1A of this embodiment, on the other hand, flat plates (a stiffener 15) are provided in correspondence to individual sides 10B, 10D to 10F

which define four sides of the bag body 10.

**[0024]** As shown in Fig.3A, the bag body 10 is the same hexahedral body as that of the first embodiment. As with the top side 2A of the first embodiment, a top side 10A of the bag body 10 is rotatable in a vertical direction of the bag body 10 so as to open or close a top side portion of the bag body 10.

**[0025]** The stiffener 15 is accommodated in the bag body 10 in conformity to the back side 10B, the left side 10D, the right side 10E and the bottom side 10F of the bag body 10. As shown in Fig.3C, the stiffener 15 includes four flat plates 15A to 15D combined into one body and is formed independently from the bag body 10. As shown in the figure, the flat plate 15A is connected to a lower edge L3 of the flat plate 15B in an upright position in a manner such that the flat plate 15A can be rotated about the edge L3 as a pivot axis and toward the flat plate 15B as indicated by an arrow in the figure. The flat plate 15C is connected to a left-side edge L11 of the flat plate 15B in a manner such that the flat plate 15C with a lower edge thereof separated from a left-side edge L21 of the flat plate 15A can be rotated toward the flat plate 15B, as indicated by an arrow in the figure. Further, the flat plate 15D is connected to a right-side edge L12 of the flat plate 15B in a manner such that the flat plate 15D with a lower edge thereof separated from a right-side edge L22 of the flat plate 15A can be rotated about the edge L12 as a pivot axis and toward the flat plate 15B, as indicated by an arrow in the figure. The flat plate 15B is accommodated in the bag body 10 and attached to an inner surface S21 of the back side 10B (see Fig.3B). Thus, the back side 10B is united with the flat plate 15B. The flat plates 15A to 15D are each formed of cardboard. It should be noted that the flat plates 15A to 15D are an example of "the plural flat plates" according to the invention.

**[0026]** In the bag body 10 before the tool storage bag 1A is folded down, the flat plate 15A rests on an inner bottom surface B2 of the bag body 10 in which the flat plate 15B is attached to substantially the overall area of the above inner surface S21 (see Fig.3B). In addition, the flat plate 15C abuts on the left-side edge L21 of the flat plate 15A at the lower edge thereof and stands upright as conforming to and supported by substantially the overall area of an inner left-side surface S11 (Fig.3B) of the bag body 10. Further, the flat plate 15D abuts on the right-side edge L22 of the flat plate 15A at the lower edge thereof and stands upright as conforming to and supported by substantially the overall area of an inner right-side surface S12 (Fig.3B) of the bag body 10. It should be noted that the inner bottom surface B2, the inner left-side surface S11 and the inner right-side surface S12 are examples of "the surface of the bag body that is corresponded by at least one flat plate" according to the invention.

**[0027]** The tool storage bag 1A may be folded down as follows. As shown in Fig.3C, the user may rotate, for example, the flat plate 15C in the bag body 10 about the above-described left-side edge L11 and toward the flat plate 15B, as separating the flat plate 15C from the

above-described left-side edge L21 of the bottom side. Thus, the flat plate 15C is overlapped on the flat plate 15B. Subsequently, the user may rotate the flat plate 15D in the bag body 10 about the right-side edge L12 and toward the flat plate 15B, as separating the flat plate 15D from the above-described right-side edge L22 of the bottom side. Thereafter, the user may rotate the flat plate 15A in the bag body 10 about the above-described lower edge L3 and toward the flat plate 15B. Thus, the stiffener 15 is folded down in the bag body 10 by sequentially overlapping the individual flat plates 15C, 15D, 15A on the flat plate 15B. That is, the flat plates 15A, 15C, 15D are detached and removed from the bottom side 10F and the lateral sides 10D, 10E of the bag body 10.

**[0028]** As shown in Fig.3B, the user may further rotate the top side 10A as indicated by an arrow in the figure so as to overlap the top side 10A on an outer surface of the back side 10B. Subsequently, folding the lateral sides 10D, 10E along fold lines and toward the inside of the bag body 10 causes the front side 10C sewn to the lateral sides 10D, 10E to be drawn to the inside of the bag body 10. Then, the bottom side 10F is folded toward the inside of the bag body 10. Accordingly, as shown in Fig.3D, the front side 10C is overlapped on the inner surface S21 while pressing, against the inner surface 21 of the back side 10B, the folded stiffener 15 together with the lateral sides 10D, 10E and the bottom side 10F which are folded inside. In this manner, the tool storage bag 1A allows the bag body 10 to be folded into a substantially flat configuration by overlapping the folded stiffener 15 and sides 10A, 10C to 10F on the back side 10B instead of folding the back side 10B. It should be noted that the back side 10B is an example of "the unfoldable side of the bag body" according to the invention, while the flat plate 15B is an example of "the flat plate corresponding to the unfoldable side" according to the invention. Further, the flat plates 15A, 15C, 15D are examples of "the at least one detached flat plate" according to the invention.

<Effects of the Second Embodiment>

**[0029]** In the tool storage bag 1A according to this embodiment, the stiffener 15 can be folded down in the bag body 10 by sequentially overlapping the flat plates 15C, 15D, 15A on the flat plate 15B attached to the back side 10B, so that the bag body 10 can be folded down. When the flat plates 15C, 15D, 15A are overlapped on the flat plate 15B, the flat plates 15A, 15C, 15D forming the stiffener 15 can be removed from the bottom side 10F and the left and right sides 10D, 10E of the bag body 10. Therefore, the sides 10D to 10F can be folded toward the inside of the bag body 10, so that the tool storage bag 1A can be folded down by overlapping the sides 10A and 10C on the back side 10B instead of folding these sides 10A, 10C.

<Third Embodiment>

**[0030]** A third embodiment of the invention is described with reference to Fig.4. In this embodiment, a similar structure to that of the first and second embodiments is briefly described or the description thereof is dispensed with. Like reference characters refer to the corresponding components of the second embodiment and the description thereof is dispensed with. A tool storage bag 1B includes a bag body 20 and the stiffener 15. The bag body 20 of the embodiment includes a left side 20D, a right side 20E, a back side 20B and a front side 20C connected together by sewing. A top side 20A of the bag body 20 is fixed to an upper edge of the back side 20B via an upper hinge member 26 so as to be rotatable about the upper edge thereof. A top side portion of the bag body 20 can be opened by rotating the top side 20A toward the back side 20B. A bottom side 20F of the bag body 20 is fixed to a lower edge of the back side 20B via a lower hinge member 27 so as to be rotatable about the lower edge thereof. A bottom portion of the bag body 20 can be opened by rotating the bottom side 20F toward the back side 20B. This embodiment is configured such that the bottom portion of the bag body 20 can be opened to take out the electric tool from the bag body 20 through an opening of the above-described bottom portion.

**[0031]** The stiffener 15 is disposed in the bag body 20 in conformity to the back side 20B, the left side 20D, the right side 20E and the bottom side 20F of the bag body 20. The flat plate 15B forming the stiffener 15 is disposed in the bag body 20 and attached to an inner surface S31 (see Fig.4B) of the back side 20B so as to be united with the back side 20B. It should be noted that an inner left-side surface and an inner right-side surface of the bag body 20 and an inner surface of the bottom side 20F of the bag body 20 are examples of "the surface of the bag body that is corresponded by at least one flat plate" according to the invention.

**[0032]** The tool storage bag 1B is folded down as follows. As with the second embodiment, the user may fold down the stiffener 15 in the bag body 20 by sequentially overlapping the flat plates 15C, 15D, 15A on the flat plate 15B. As a result, the flat plates 15A, 15C, 15D can be detached and removed from the bottom side 20F and the lateral sides 20D, 20E of the bag body 20.

**[0033]** Further, as shown in Fig.4B, the user may rotate the top side 20A of the bag body 20 outward about the hinge 26 so as to overlap the top side on an outer surface of the back side 20B. Subsequently, the user may rotate the bottom side 20F about the hinge 27 and toward the back side 20B as indicated by an arrow in the figure, overlapping the bottom side on the side 20A. Further, the user may press the left side 20D against the inner surface S31 and squash the tetrahedral configuration defined by the interconnected sides 20B to 20E while pressing the folded stiffener 15 against the inner surface S31. In this manner, the individual sides 20B to 20E connected together are brought into a substantially flat configuration.

As shown in Fig.4D, the tool storage bag 1B is designed to permit the bag body 20 to be folded into the substantially flat configuration by overlapping the sides 20A and 20F, the folded stiffener 15 and the left side 20D on the back side 20B in stead of folding the six sides 20A to 20F. It should be noted that the back side 20B of this embodiment is an example of "the unfoldable side of the bag body" according to the invention. It is further noted that the hinge members 26, 27 are not depicted in Fig.4D.

<Effects of the Third Embodiment>

**[0034]** As with the second embodiment, the tool storage bag 1B of this embodiment is designed to allow the stiffener 15 to be folded down in the bag body 20 and to allow the bag body 20 with the stiffener 15 folded therein to be folded down. Hence, the flat plates 15A, 15C, 15D forming the stiffener 15 can be removed from the bottom side 20F and the lateral sides 20D, 20E of the bag body 20, just as in the second embodiment. Therefore, the sides 20B to 20E, connected with one another, can be arranged into the substantially flat configuration and the tool storage bag 1B can be folded down by overlapping the sides 20A, 20D, 20F on the back side 20B.

<Fourth Embodiment>

**[0035]** A fourth embodiment of the invention is described with reference to Fig.5. In this embodiment, a similar structure to that of the first to third embodiments is briefly described or the description thereof is dispensed with. A tool storage bag 1C includes a bag body 30 and a stiffener 35. As with the first to third embodiments, the bag body 30 is a hexahedral body, while the bag body 30 has a smaller height than the bag bodies 2, 10, 20 of the first to third embodiments. As with the first and second embodiments, a top side 30A of the bag body 30 is adapted to open or close a top side portion of the bag body 30.

**[0036]** As shown in Fig.5C, the stiffener 35 includes four flat plates 35A to 35D formed in one piece and is independent from the bag body 30. The stiffener 35 is disposed in the bag body 30 in conformity to a back side 30B, a left side 30D, a right side 30E and a bottom side 30F thereof. The flat plates 35A forming the stiffener 35 is attached to an inner bottom surface B3 (see Fig.5A) of the bag body 30 so as to be united with the inner bottom surface B3.

**[0037]** The flat plate 35B stands upright on a back-side edge L4 of the flat plate 35A and is connected to the flat plate 35A in a manner to be rotatable about the back-side edge L4 and toward the flat plate 35A as indicated by an arrow in the figure. The flat plate 35C is connected to a left-side edge L31 of the flat plate 35B. However, the flat plate 35C can be rotated toward the flat plate 35B as indicated by an arrow in the figure because a lower edge of the flat plate 35C is separated from a left-side edge L41 of the flat plate 35A. Similarly, the flat plate 35D is connected to a right-side edge L32 of the flat plate 35B.

However, the flat plate 35D can be rotated toward the flat plate 35B as indicated by an arrow in the figure because a lower edge of the flat plate 35D is separated from a right-side edge L42 of the flat plate 35A. It should be noted that the flat plates 35A to 35D are an example of "the plural flat plates" according to the invention.

**[0038]** Before the tool storage bag 1C is folded down, as shown in Fig.5B, the flat plate 35B stands upright in the bag body 30 as supported by substantially the overall area of an inner surface S41 of the back side 30B while the flat plate 35A is attached to substantially the overall area of the inner bottom surface B3. Further in the bag body 30, the flat plate 35C abuts on the left-side edge L41 of the flat plate 35A at a lower edge thereof and stands upright as supported by substantially the overall area of an inner left-side surface S51 of the bag body 30. Further, the flat plate 35D abuts on the right-side edge L42 of the flat plate 35A at a lower edge thereof and stands upright as supported by substantially the overall area of an inner right-side surface S52 of the bag body 30. It should be noted that the inner surface S41, the inner left-side surface S51 and the inner right-side surface S52 are examples of "the surface of the bag body that is corresponded by at least one flat plate" according to the invention.

**[0039]** The tool storage bag 1C may be folded down as described below. First, the user may overlap the flat plate 35C on the flat plate 35B in the bag body 30 in the same way as in the second embodiment shown in Fig. 5C. Subsequently, the flat plate 35D is rotated toward the flat plate 35B in the bag body 30 in the same way as in the second embodiment. In the bag body 30, the flat plate 35B is rotated about the back-side edge L4 and toward the flat plate 35A. In this manner, the stiffener 35 is folded down in the bag body 30 by sequentially overlapping the flat plates 35D, 35C, 35B on the flat plate 35A. As a result, the flat plates 35B to 35D can be detached from the back side 30B and the lateral sides 30D, 30E of the bag body 30.

**[0040]** Further, as shown in Fig.5B, the lateral sides 30D, 30E are folded inward by folding the lateral sides along valley fold lines and toward the inside of the bag body 30 as indicated by arrows in the figure. Consequently, as shown in Fig.5D, the front side 30C and the back side 30B, which are sewn to the lateral sides 30D and 30E, are drawn to the inside of the bag body 30 without being folded and to be overlapped on the lateral sides 30D, 30E folded down as described above. At this time, the top side 30A is rotated away from a top opening of the bag body 30 so that the top side 30A is partially overlapped, without being folded, on the back side 30B folded inside. As described above, the tool storage bag 1C is designed to permit the bag body 30 to be folded into the substantially flat configuration by overlapping, on the bottom side 30F, the folded stiffener 35, the lateral sides 30D, 30E and the sides 30A to 30C folded inside as described above, in stead of folding the individual sides 30A to 30C and 30F. It should be noted that the bottom side

30F is an example of "the unfoldable side of the bag body" according to the invention, while the flat plate 35A is an example of "the flat plate corresponding to the above unfoldable side" according to the invention. Further, the flat plates 35B to 35D are examples of "the at least one detached flat plate" according to the invention.

<Effects of the Fourth Embodiment>

**[0041]** According to the tool storage bag 1C of this embodiment, the stiffener 35 can be folded down by sequentially overlapping the flat plates 35D, 35C, 35B on the flat plate 35A attached to the inner bottom surface B3, thus allowing the bag body 30 to be folded down. When the stiffener 35 is folded down by overlapping the flat plates 35D, 35C, 35B on the flat plate 35A the flat plates 35B to 35D can be removed from the back side 30B and the lateral sides 30D, 30E of the bag body 30. Therefore, the lateral sides 30D, 30E can be folded toward the inside of the bag body 30. Hence, the tool storage bag 1C can be folded down by overlapping the individual sides 30A to 30C on the bottom side 30F in stead of folding these sides.

<Fifth Embodiment>

**[0042]** A fifth embodiment of the invention is described with reference to Fig.6. In this embodiment, a similar structure to that of the first to fourth embodiments is briefly described or the description thereof is dispensed with. Like reference characters refer to the corresponding components of the second and third embodiments and the description thereof is dispensed with. A tool storage bag 1D includes a bag body 40 and the stiffener 15. As with the first, second and fourth embodiments, a top side 40A of the bag body 40 is adapted to open or close a top side portion of the bag body 40.

**[0043]** The stiffener 15 is disposed in the bag body 40 in conformity to a back side 40B, a left side 40D, a right side 40E and a bottom side 40F thereof. The back side 40B and the flat plate 15B are united in the same way as in the second and third embodiments.

**[0044]** In the bag body 40 before the tool storage bag 1D is folded down, the flat plate 15A rests on an inner bottom surface B4 of the bag body 40 in which the flat plate 15B is attached to an inner surface S61 of the back side 40B, as shown in Fig.6B. In addition, as with the second embodiment, the flat plate 15C stands upright in the bag body 40 as conforming to and supported by an inner left-side edge S71 of the bag body 40. Further, the flat plate 15D stands upright as conforming to and supported by an inner right-side surface S72 of the bag body 40. It should be noted that the inner bottom surface B4, the inner left-side surface S71 and the inner right-side surface S72 are examples of "the surface of the bag body that is corresponded by at least one flat plate" according to the invention.

**[0045]** The tool storage bag 1D may be folded down

as described below. When the stiffener 15 is folded down in the bag body 40 just as in the second embodiment, the flat plates 15A, 15C, 15D forming the stiffener 15 can be detached from the bottom side 40F and the lateral sides 40D, 40E of the bag body 40.

**[0046]** Further, the user may rotate the top side 40A about a lower edge thereof and toward the back side 40B as indicated by an arrow in the figure, so as to overlap the top side 40A on an outer surface of the back side 40B, as shown in Fig.6B. Subsequently, the user may fold the lateral sides 40D, 40E along fold lines toward the inside of the bag body 40 while closing the bag body 40 in a fore-aft direction thereof (the transverse direction as seen in Fig.6B) as indicated by arrows in the figure. As a result, the front side 40C sewn to the lateral sides 40D, 40E are drawn toward the inside of the bag body 40. Then, the front side 40C is folded in a fold line toward the inside of the bag body 40. Namely, the front side is folded up in a vertical direction of the bag body 40 (the vertical direction as seen in Fig.6B) as indicated by an arrow in the figure. As a result, the bottom side 40F sewn to the front side 40C is raised without being folded. Then the user may press the folded front side 40C against the inner surface S61 of the back side 40B to thereby overlap the front side on the inner surface S61 together with the bottom side 40F. As shown in Fig.6D, the tool storage bag 1D is designed to allow the bag body 40 to be folded into the substantially flat configuration by overlapping, on the back side 40B, the top side 40A, the folded stiffener 15, the sides 40C to 40E folded inside and the bottom side 40F in stead of folding the three sides 40A, 40B and 40F. It should be noted that the back side 40B of this embodiment is an example of "the unfoldable side of the bag body" according to the invention.

<Effects of the Fifth Embodiment>

**[0047]** As with the second embodiment, the tool storage bag 1D of this embodiment is designed to allow the stiffener 15 to be folded down in the bag body 40 and to allow the bag body 40 with the stiffener 15 folded therein to be folded down. Therefore, the flat plates 15A, 15C, 15D can be removed from the bottom side 40F and the lateral sides 40D, 40E of the bag body 40, just as in the second embodiment. As a result, the lateral sides 40D, 40E can be folded toward the inside of the bag body 40. Thus, the tool storage bag 1D can be folded down by folding inside the front side 40C free from the stiffener 15, followed by overlapping the top side 40A and the bottom side 40F on the back side 40B.

**[0048]** When carrying the electric tools in the tool storage bag or the like, the user has a desire to be able to carry multiple tool storage bags at a time. Fig.7 illustrates an example where two tool storage bags 50A, 50B are stacked on top of each other to be carried together. The tool storage bag 50 is a soft case bag, the entire surface skin of which is formed of an enamel material. The tool storage bag 50 has excellent waterproof and oil-proof

properties as a result of the use of the enamel material. A slide fastener F is attached to an upper end of a case body 51 of the tool storage bag 50, extending along three sides (except for a back side) of the bag body 51. Thus, a top side of the case body 51 defines a case cover 52 for openably closing the case body.

**[0049]** A left side 53 and a right side 54 of the case body 51 each has a reinforcing belt 56 sewn thereon. The reinforcing belt 56 is extended in a vertical direction of the bag body and is so located as to divide each of the lateral sides 53, 54 into right and left halves. A metal ring 57 is fastened to an upper end of the reinforcing belt 56, while a belt loop member 58 formed of the enamel material is fastened to a lower end of the reinforcing belt 56.

**[0050]** In a state where the tool storage bag 50B is stacked on the tool storage bag 50A as shown in Fig.7, one end of a shoulder belt 60A for the tool storage bag 50A is inserted through the metal ring 57 and the belt loop member 58 on the left side 53 of the tool storage bag 50B. Subsequently, a metal hook 61A at the one end of the shoulder belt 60A is coupled to a metal ring 57 on the left side 53 of the tool storage bag 50A.

**[0051]** A metal hook (not shown) at the other end of the shoulder belt 60A is coupled to a metal hook (not shown) at one end of a shoulder belt 60B for the tool storage bag 50B. Couplings of these metal hooks are received in a shoulder pad 62A of the shoulder belt 60A and a shoulder pad 62B of the shoulder belt 60B, respectively.

**[0052]** The other end of the shoulder belt 60B is inserted through a metal ring 57 and a belt loop member 58 on the right side 54 of the tool storage bag 50B. Subsequently, a metal hook 61B at the other end of the shoulder belt 60B is coupled to a metal ring 57 on the right side 54 of the tool storage bag 50A. As described above, the user can carry the stacked tool storage bags 50A, 50B on his shoulder, using the shoulder belts 60A, 60B with the shoulder pads 62A, 62B placed on his shoulder.

**[0053]** The present invention should not be limited to the foregoing embodiments and can be reduced to practice with any partial change or modification made thereto as needed so long as such change or modification does not depart from the scope and spirit of the invention. For example, the arrangement of the above-described second and fourth embodiments may be changed as follows. The stiffener 15 is configured to be received in the bag body 10, 30 in conformity to the front side, the lateral sides and the bottom side thereof, before the tool storage bag 1A, 1C is folded down. Namely, the flat plates forming the stiffener 15 stand upright in conformity to the four sides (front side, lateral sides and bottom side) of the bag body 10, 30.

**[0054]** The above-described first to fifth embodiments have the arrangement wherein each of the flat plates stands upright in conformity to substantially the overall area of one side of the bag body before the tool storage bag is folded down. However, the invention is not limited to this. In an alternative arrangement, each of the flat

plates may stand upright in conformity to a part of one side of the bag body so long as the flat plate can prevent the deformation of the bag body. Further, the second, third and fifth embodiments are arranged such that the flat plate is attached to the inner surface of the back side of the bag body. Alternatively, the flat plate may be sewn to the inner surface of the back side.

**[0055]** According to the foregoing second to fourth embodiments, the flat plates stand upright in conformity to the four sides of the bag body before the tool storage bag is folded down. However, the invention is not limited to this. In the second embodiment, for example, the bag body 10 may be provided with the flat plates on five sides thereof by enclosing an additional flat plate in the front side 10C thereof. Furthermore, the bag body 10 may be provided with the flat plates on six sides thereof by enclosing a further additional flat plate in the top side 10A thereof. In the third and fourth embodiments, as well, each of the bag bodies 20, 30 may also be provided with the flat plates on five or six sides thereof in the same way as described in this paragraph.

**[0056]** Furthermore, the foregoing second to fifth embodiments are designed to allow the respective stiffeners to be folded down in the respective bag bodies. As with the first embodiment, the second to fifth embodiments may also be arranged such that the stiffener can be taken out of the bag body. Further, the above-described first embodiment may be changed such that the front side 2C does not incorporate the flat plate but the top side 2A and the back side 2B incorporate therein the flat plate, respectively, and that the inner bottom surface B1 alone or only one of the inner left-side and right-side surfaces S1, S2 is provided with a flat plate detachable from the surface B1, S1, S2. In this arrangement, this detachable flat plate may be taken out of the bag body 2. Furthermore, the second to fifth embodiments may also be changed such that a stiffener unifying three flat plates is folded down in the bag body. In this case, for example, an arrangement may be made such that one of the flat plates is united with the back side of the bag body while the other flat plates are provided in conformity to one of the lateral sides of the bag body and the bottom side thereof, respectively, and that the flat plates other than that united with the back side are detached from the one lateral side and the bottom side and then are overlapped on the flat plate united with the back side.

**[0057]** The location of the belt loop member 58 used when the tool storage bags 50A, 50B are stacked on top of each other is not limited to that shown in Fig.7. The belt loop member may be attached to the reinforcing belt 56 at any suitable place in a vertical direction thereof.

**[0058]** It is explicitly stated that all features disclosed in the description and/or the claims are intended to be disclosed separately and independently from each other for the purpose of original disclosure as well as for the purpose of restricting the claimed invention independent of the composition of the features in the embodiments and/or the claims. It is explicitly stated that all value rang-

es or indications of groups of entities disclose every possible intermediate value or intermediate entity for the purpose of original disclosure as well as for the purpose of restricting the claimed invention, in particular as limits of value ranges.

## Claims

1. A tool storage bag (1; 1A; 1B; 1C; 1D) comprising a hexahedral fabric bag body (2; 10; 20; 30; 40) openable only at a top side (2A; 10A; 30A; 40A) or at the top side (20A) and a bottom side (20F), and an interlining material at least provided at three adjoining sides of the bag body (2; 10; 20; 30; 40),  
**characterized in that** the interlining material comprises a plurality of flat plates (2A, 2B, 2C, 3A, 3B, 3C; 10A, 10B, 10C, 15A, 15B, 15C, 15D; 20A, 20B, 20C, 20D, 20E, 20F, 15A, 15B, 15C, 15D; 30A, 30B, 30C, 30F, 35A, 35B, 35C, 35D; 40A, 40B, 40F, 15A, 15B, 15C, 15D) corresponding to the three sides and at least one of the flat plates (3A, 3B, 3C; 15A, 15B, 15C, 15D; 35A, 35B, 35C, 35D) is detachable from a corresponding one of the sides of the bag body (2; 10; 20; 30; 40),  
 that the bag body (2; 10; 20; 30; 40) can be folded down without folding the sides provided with the interlining material, and  
 that the bag body (2; 10; 20; 30; 40) with the at least one flat plate (3A, 3B, 3C; 15A, 15B, 15C, 15D; 35A, 35B, 35C, 35D) detached from the corresponding side is folded down by overlapping, on one of the unfoldable sides (2B; 10B; 20B; 30B; 40B) of the bag body (2; 10; 20; 30; 40), the other side (2A; 10A; 20A; 30A; 40A) provided with the interlining material.
2. The tool storage bag (1; 1A; 1B; 1C; 1D) according to Claim 1, wherein the bag body (2; 10; 20; 30; 40) can be folded down by removing the at least one detached flat plate (3A, 3B, 3C; 15A, 15B, 15C, 15D; 35A, 35B, 35C, 35D) from the bag body (2; 10; 20; 30; 40) and overlapping the other side (2A; 10A; 20A; 30A; 40A) on one of the unfoldable sides (2B; 10B; 20B; 30B; 40B).
3. The tool storage bag (1) according to Claim 1 or 2, wherein  
 the three adjoining sides are a back side (2B), the top side (2A) and an inner bottom surface (B1) of the bag body (2) or the back side (2B), the top side (2A) and either one of inner right-side and left-side surfaces (S1, S2) of the bag body (2),  
 the flat plate is incorporated in the back side (2B) and the top side (2A), respectively,  
 an inner body (3) combining three flat plates (3A, 3B, 3C) including the one detachable flat plate is provided in correspondence to the inner bottom surface

- (B1) and the inner right-side and left-side surfaces (S1, S2) and is supported in the bag body (2) in conformity to the inner bottom surface (B1) and the inner right-side and left-side surfaces (S1, S2) in a manner to be detachable from each of the inner bottom surface (B1) and the inner right-side and left-side surfaces (S1, S2) and that removing the inner body from the bag body (2) allows the bag body (2) to be folded down by overlapping the top side (2A) on the back side (2B) as the unfoldable side.
4. The tool storage bag (1A; 1B; 1C; 1D) according to Claim 1, the interlining material can be folded down in the bag body (10; 20; 30; 40) by overlapping the at least one detached flat plate on one of the flat plates (15A, 15B, 15C, 15D; 35A, 35B) that is united with a corresponding unfoldable side, and the bag body (10; 20; 30; 40) with the interlining material folded therein can be folded down.
  5. The tool storage bag (1) according to Claim 3, the inner body (3) can be supported in the bag body (2) while the three flat plates thereof are in conformity to substantially the overall area of the inner bottom surface (B1) and substantially the overall areas of the inner right-side and left-side surfaces (S2, S1) of the bag body (2).
  6. The tool storage bag (1) according to Claim 3 or 5, the three flat plates (3A, 3B, 3C) comprise a first flat plate (3A) detachably resting on the inner bottom surface (B1), a second flat plate (3B) that stands upright on a left-side edge (L1) of the first flat plate (3A) as connected thereto in a manner to be rotatable toward the first flat plate (3A) and that is detachably supported by the inner left-side surface (S1), and a third flat plate (3C) that stands upright on a right-side edge (L2) of the first flat plate (3A) as connected thereto in a manner to be rotatable toward the first flat plate (3A) and that is detachably supported by the inner right-side surface (S2).
  7. The tool storage bag (1A; 1B; 1D) according to Claim 4, the plurality of flat plates (15A, 15B, 15C, 15D) comprise a first flat plate (15B) standing upright as united with an inner surface of a back side (10B; 20B; 40B) of the bag body (10; 20; 40) as the unfoldable side, a second flat plate (15A) detachably resting on an inner bottom surface of the bag body (10; 20; 40) as connected to a lower edge (L3) of the first flat plate (15B) in a manner to be rotatable toward the first flat plate (15B), a third flat plate (15C) detachably supported by an inner left-side surface (S11; S71) of the bag body (10; 20; 40) as connected to a left-side edge (L21) of the first flat plate (15B) in a manner to be rotatable toward the first flat plate (15B), and a fourth flat plate (15D) detachably supported by an inner right-side surface (S12; S72) of the bag body (10; 20; 40) as connected to a right-side edge (L22) of the first flat plate (15B) in a manner to be rotatable toward the first flat plate (15B), and that the second to fourth flat plates (15A, 15C, 15D) can be overlapped on the first flat plate (15B) in the bag body (10; 20; 40) by respectively rotating the second to fourth flat plates (15A, 15C, 15D) about the lower edge (L3), the left-side edge (L21) and the right-side edge (L22) and toward the first flat plate (15B).
  8. The tool storage bag (1C) according to Claim 4, the plurality of flat plates (35A, 35B, 35C, 35D) comprise a first flat plate (35A) united with an inner bottom surface (B3) of the bag body (30) as the unfoldable side, a second flat plate (35B) that stands upright as connected to a back-side edge (L4) of the first flat plate (35A) in a manner to be rotatable toward the first flat plate (35A) and that is detachably supported by an inner surface of a back side (30B) of the bag body (30), a third flat plate (35C) detachably supported by an inner left-side surface (S51) of the bag body (30) as connected to a left-side edge (L41) of the second flat plate (35B) in a manner to be rotatable toward the second flat plate (35B), and a fourth flat plate (35D) detachably supported by a inner right-side surface (S52) of the bag body (30) as connected to a right-side edge (L42) of the second flat plate (35B) in a manner to be rotatable toward the second flat plate (35B), and that the second to fourth flat plates (35B, 35C, 35D) can be overlapped on the first flat plate (35A) in the bag body (30) by rotating the third and fourth flat plates (35C, 35D) about the left-side edge (L41) and the right-side edge (L42) and toward the second flat plate (35B) and overlapping the third and fourth flat plates (35C, 35D) on the second flat plate (35B), followed by rotating the second flat plate (35B) together with the third and fourth flat plates (35C, 35D) about the back-side edge (L4) and toward the first flat plate (35A).
  9. The tool storage bag (1) according to any one of Claims 1 to 8, wherein the flat plate is formed of cardboard.

Fig.1A

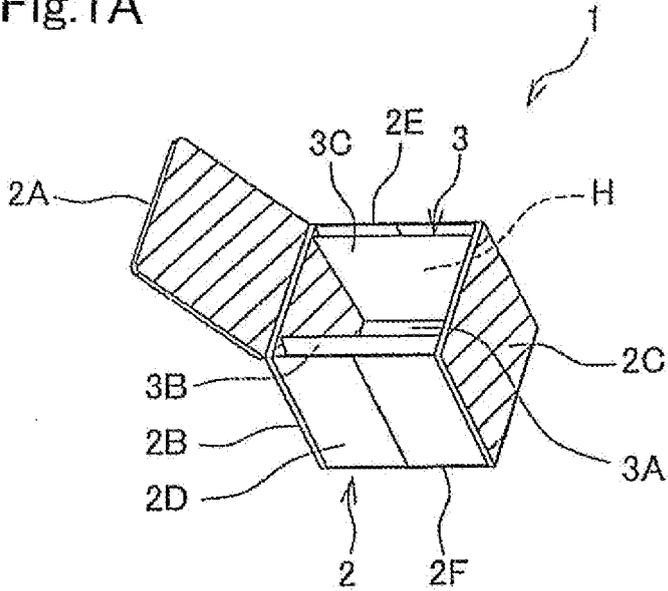


Fig.1B

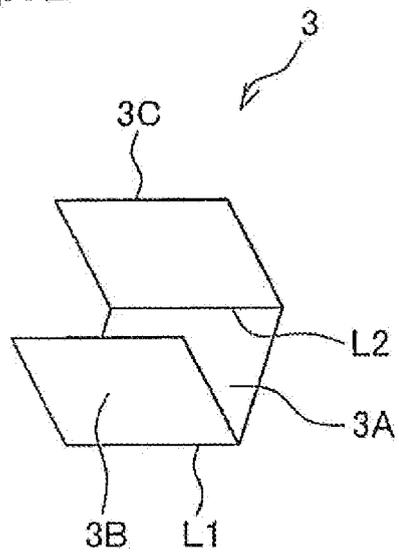


Fig.1C

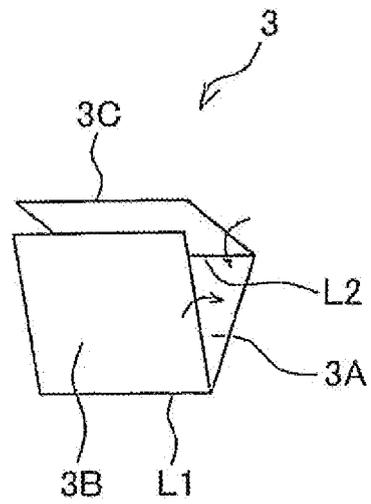


Fig.2A

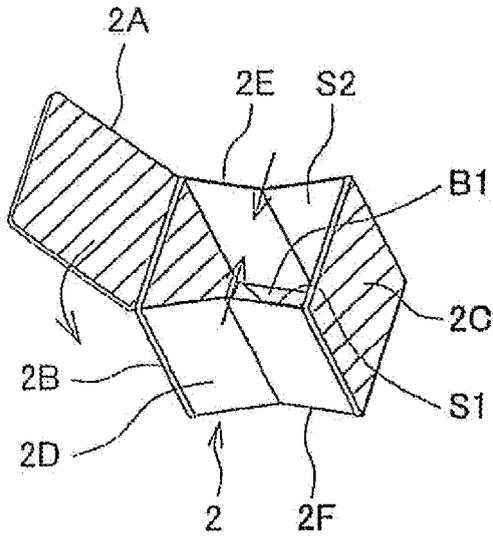


Fig.2B

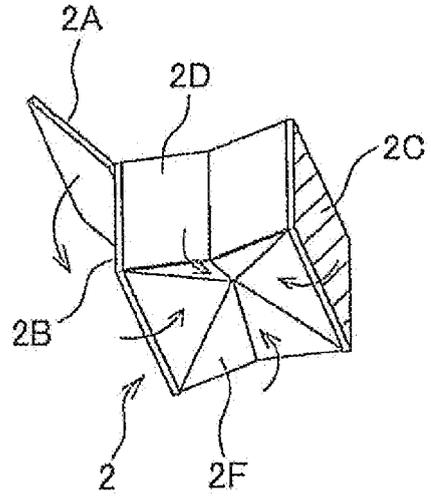


Fig.2C

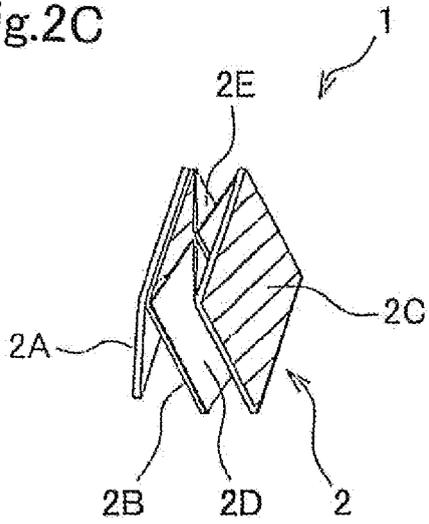


Fig.3A

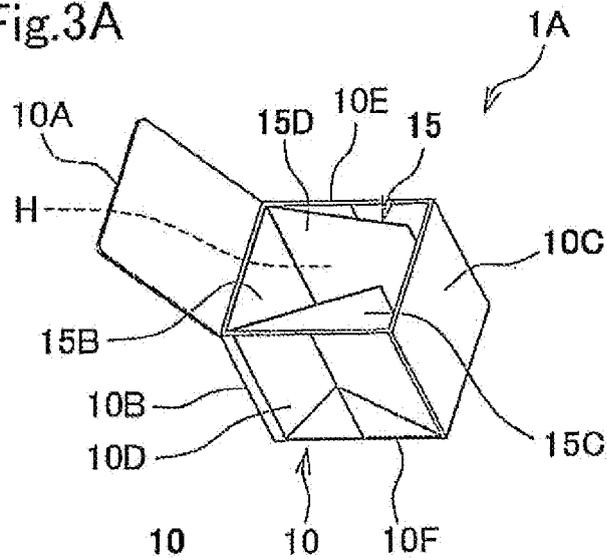


Fig.3B

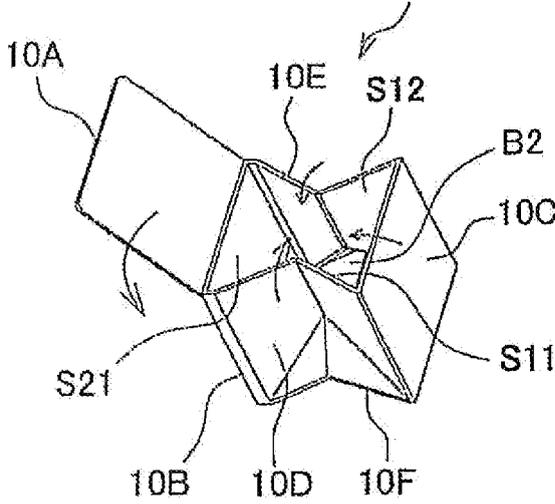


Fig.3C

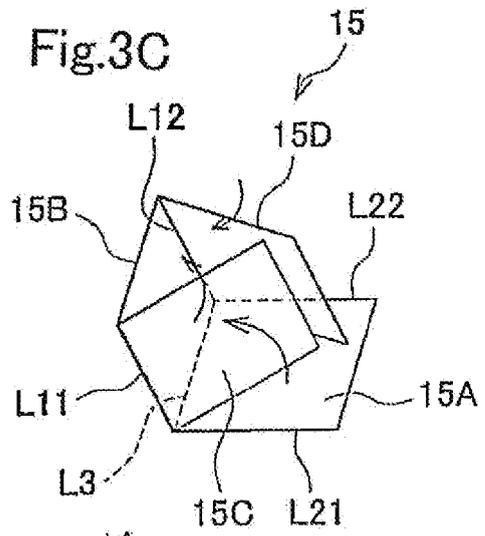


Fig.3D

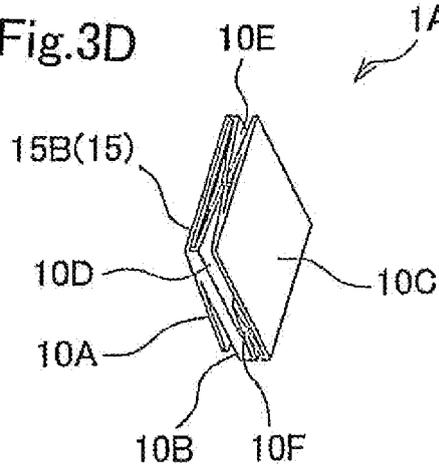


Fig.4A

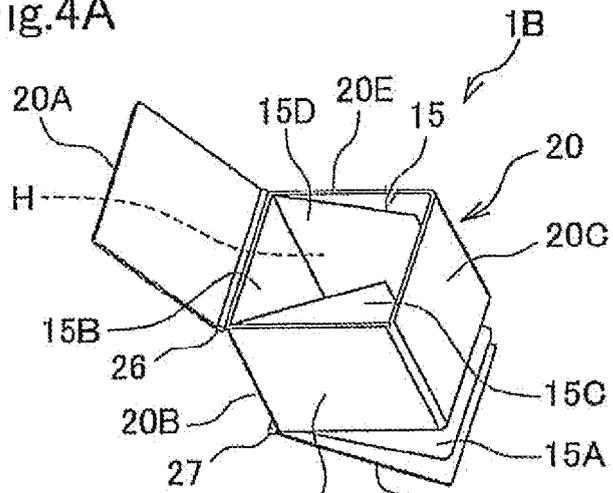


Fig.4B

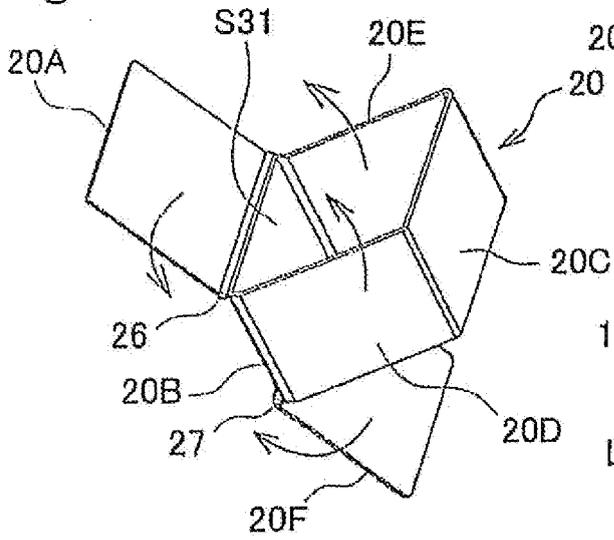


Fig.4C

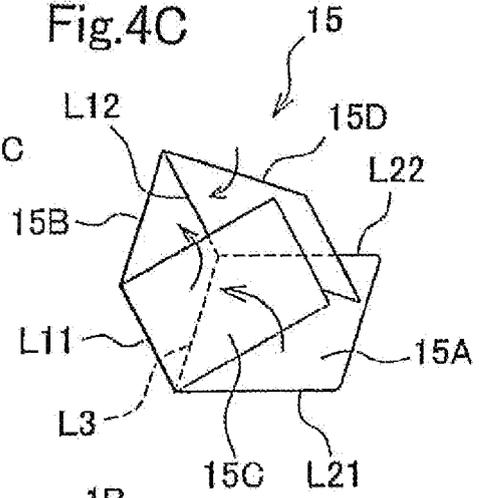


Fig.4D

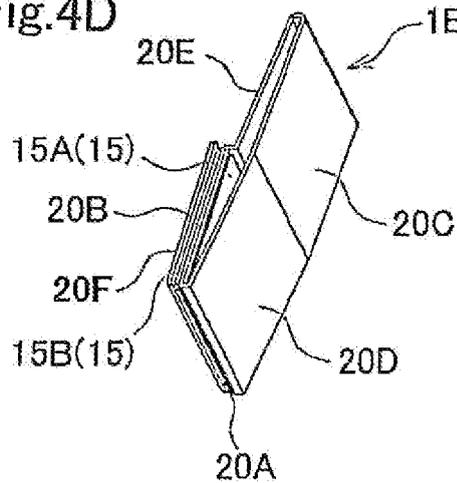


Fig.5A

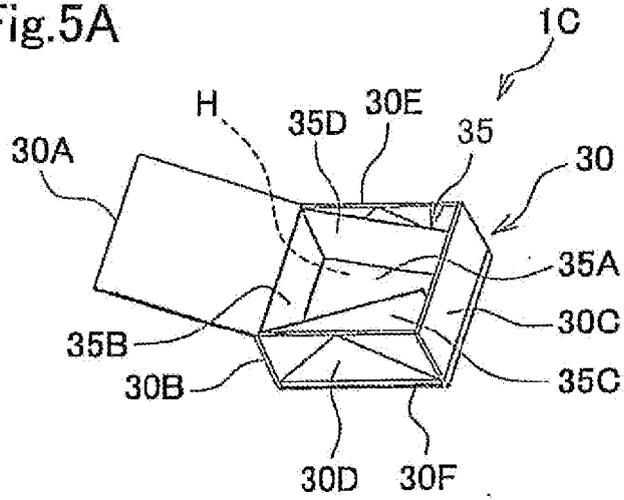


Fig.5B

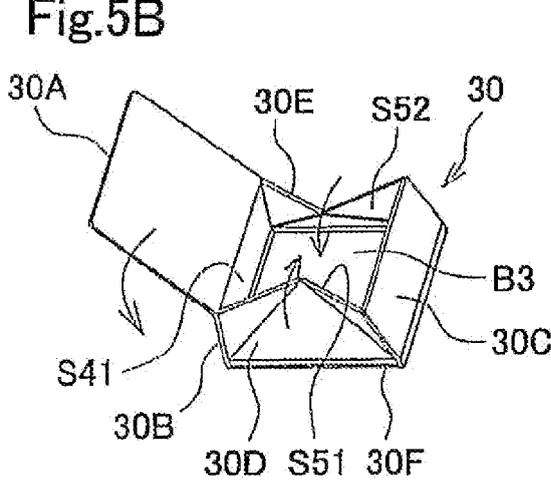


Fig.5C

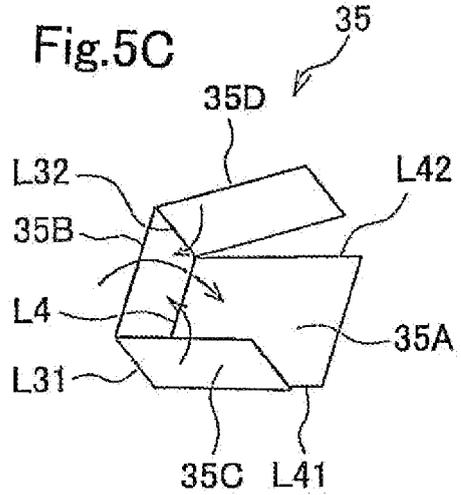


Fig.5D

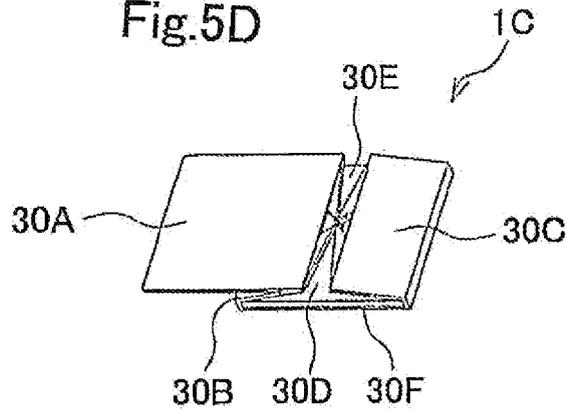


Fig.6A

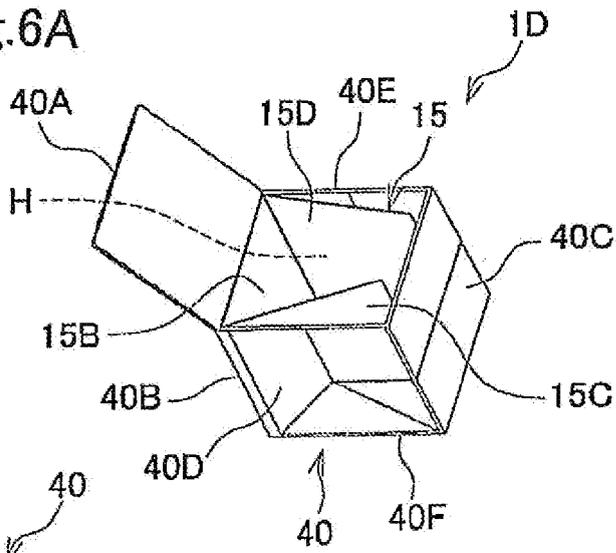


Fig.6B

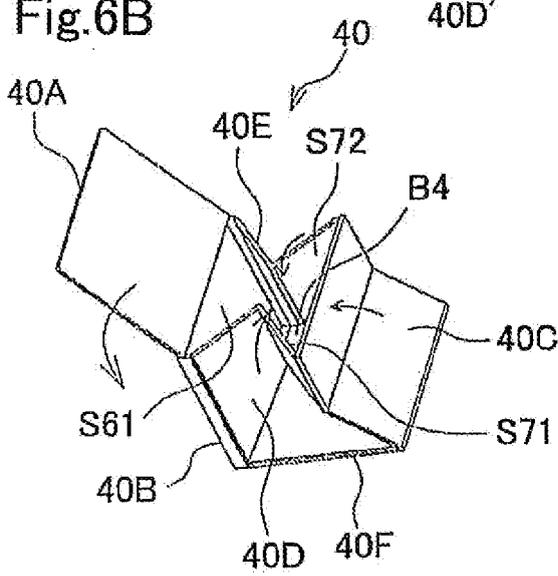


Fig.6C

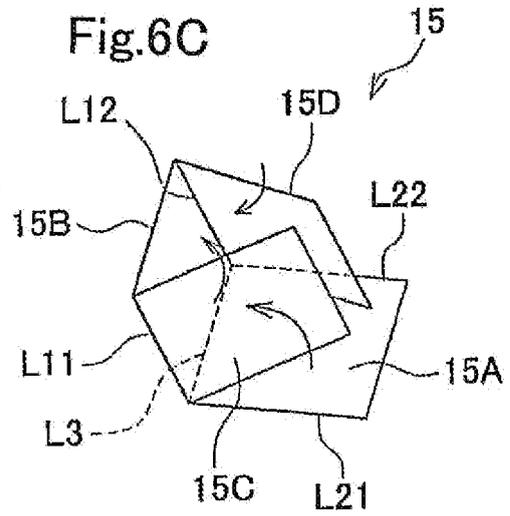


Fig.6D

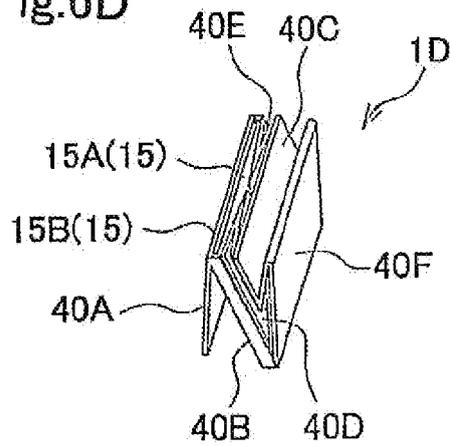


Fig.7A

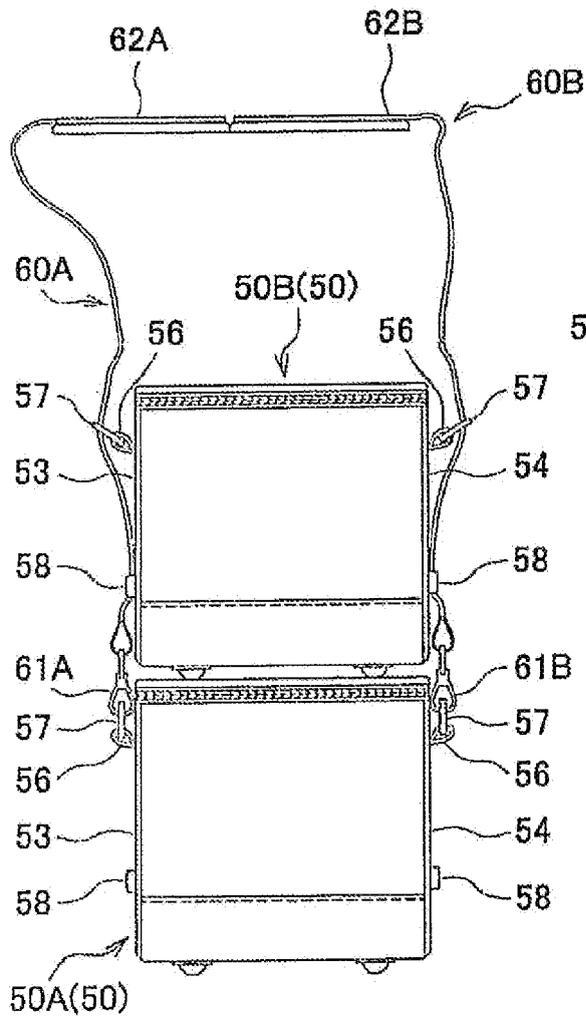
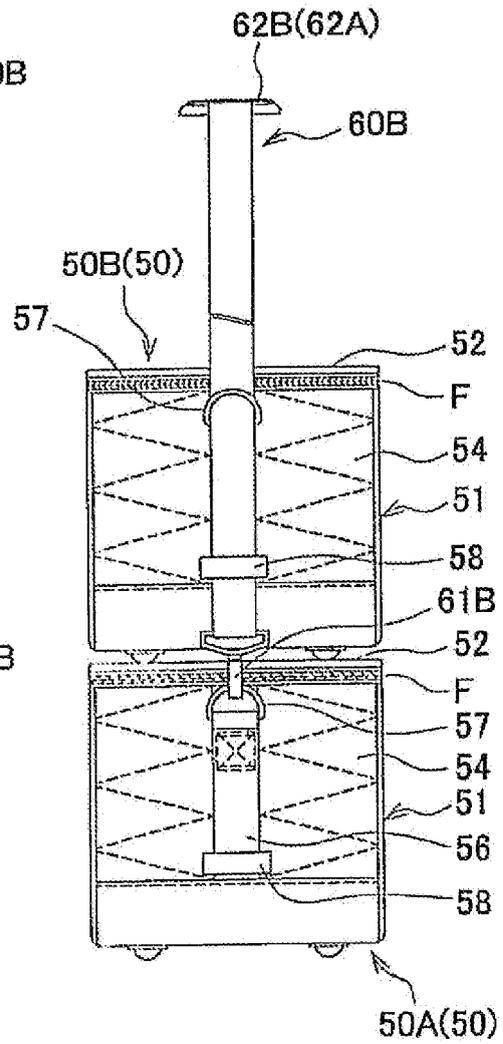


Fig.7B





EUROPEAN SEARCH REPORT

Application Number  
EP 11 17 2950

DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
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Place of search The Hague		Date of completion of the search 20 October 2011	Examiner Nicolás, Carlos	
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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                      &amp; : member of the same patent family, corresponding document</p>				

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