Claims

[Claim 1] A top forming part creasing mechanism in a device for forming a top portion of a paper container,

the paper container being formed of a carton blank including:

a body front panel;

a body right side panel;

a body left side panel;

a body back panel;

a top upper surface panel, which is continuously provided on an upper edge of the body back panel through a horizontal folding line;

a top upper surface auxiliary panel, which is continuously provided on an upper edge of the body front panel through a horizontal folding line, and is folded on a lower side of the top upper surface panel to overlap with the top upper surface panel; and

a right side panel and a left side panel, which are continuously provided on upper edges of the body right side panel and the body left side panel through horizontal folding lines, and are folded outwardly along with overlapping of the top upper surface panel and the top upper surface auxiliary panel,

the top upper surface panel having a suction port formed in a center thereof, the top upper surface auxiliary panel having a vertical length that prevents the top upper surface auxiliary

panel from reaching the suction port formed in the top upper surface panel, the top upper surface auxiliary panel having a sealing panel continuously provided on an edge thereof through a horizontal folding line, vertical edge portions of the carton blank, which includes a thermoplastic resin layer laminated at least on an inner surface thereof, being bonded together so that the carton blank is formed into a quadrangular tubular shape,

the top forming part creasing mechanism being configured to:

fit the carton blank formed into a tubular shape onto a mandrel;

cause a top forming part, which includes the top upper surface panel, the top upper surface auxiliary panel, the right side panel, and the left side panel of the carton blank, to protrude from a tip of the mandrel;

valley-fold, along the horizontal folding line, the sealing panel continuously provided on the protruding top upper surface auxiliary panel;

bond an inner surface of the sealing panel and an inner surface of the top upper surface panel to each other to seal the carton blank; and

bond the right side panel and the left side panel having been folded at respective overlapping surfaces to seal the carton blank, thereby forming a top portion,

the top forming part creasing mechanism comprising:

first creasing means that valley-folds, along the horizontal folding lines, the right side panel and the left side panel of the carton blank fitted onto the mandrel so as to spread out the right side panel and the left side panel from a center to an outer side of the carton blank;

second creasing means that makes creases by inwardly mountain-folding the top upper surface panel and the top upper surface auxiliary panel, ~~which have been creased by the first creasing means,~~ along the horizontal folding lines; and

third creasing means that makes a crease by outwardly valley-folding the sealing panel, which is provided on the edge of the top upper surface auxiliary panel ~~having been creased by the second creasing means~~, along the horizontal folding line.

[Claim 2] The top forming part creasing mechanism in a device for forming a top portion of a paper container according to claim 1, wherein the first creasing means includes a spreading member that is supported so as to be capable of advancing to and retreating from the top forming part, is advanced to enter the top forming part, and valley-folds the right side panel and the left side panel along the horizontal folding lines so as to spread out the right side panel and the left side panel from the center to the outer side.

[Claim 3] The top forming part creasing mechanism in a device

for forming a top portion of a paper container according to claim 1, wherein the second creasing means includes:

a first pressing member, which is supported so as to be capable of advancing to and retreating from the top upper surface panel, and is advanced to press the top upper surface panel and mountain-fold the top upper surface panel along the horizontal folding line; and

a second pressing member, which is supported so as to be capable of advancing to and retreating from the top upper surface auxiliary panel, and is advanced to press the top upper surface auxiliary panel and mountain-fold the top upper surface auxiliary panel along the horizontal folding line.

[Claim 4] The top forming part creasing mechanism in a device for forming a top portion of a paper container according to claim 1, wherein the third creasing means includes:

a receiving plate member, which receives, on a plate surface thereof, an edge of the sealing panel from the inner surface side of the sealing panel; and

a bending plate member, which presses a joining portion between the top upper surface auxiliary panel and the sealing panel from an outer surface side of the sealing panel toward the receiving plate member so as to valley-fold the sealing panel along the horizontal folding line.

[Claim 5] The top forming part creasing mechanism in a device for forming a top portion of a paper container according to claim 4,

wherein the receiving plate member and the bending plate member are arranged so as to be opposed to each other with a clearance, and are integrally formed with rear end sides of the receiving plate member and the bending plate member being connected to each other,

wherein a length of the receiving plate member on a distal end side is longer than that of the bending plate member,

wherein between the receiving plate member and the bending plate member, a groove portion, which enables the sealing panel to be inserted thereinto from an upper edge side of the sealing panel, is defined, and

wherein the receiving plate member and the bending plate member are supported so as to be capable of advancing to and retreating from the sealing panel, and are advanced to bring the edge of the sealing panel into abutment against the plate surface of the receiving plate member and guide the edge of the sealing panel into the groove portion, and the distal end of the bending plate member presses the joining portion between the top upper surface auxiliary panel and the sealing panel from the outer surface side toward the receiving plate member, thereby valley-folding the sealing panel along the horizontal folding line.

[Claim 6] The top forming part creasing mechanism in a device for forming a top portion of a paper container according to claim 4,

wherein the receiving plate member is supported so as to be capable of advancing to and retreating from the inner surface side of the edge of the sealing panel,

wherein the bending plate member is supported so as to be capable of advancing to and retreating from the joining portion between the top upper surface auxiliary panel and the sealing panel,

wherein the receiving plate member is advanced so as to enable the edge of the sealing panel to come into abutment against the plate surface of the receiving plate member, and

wherein the bending plate member is advanced to press the joining portion between the top upper surface auxiliary panel and the sealing panel from the outer surface side toward the receiving plate member, and brings the edge of the sealing panel into abutment against and press contact with the plate surface of the advancing receiving plate member, thereby valley-folding the sealing panel along the horizontal folding line.