Title: ARTICLE CARRIER WITH INTERNAL PARTITION STRUCTURE AND BLANK THEREOF

Abstract: An article carrier and blank (10) for forming an article carrier for securing a plurality of articles (A), for example bottles, which carrier comprises a pair of side walls (12, 14, 16, 18) and including article gripping means (58). The article gripping means (58) are adapted operatively to engage and retain part of an article (A) received in said pair of article gripping apertures (40, 42, 44). The side panels (12, 14, 16, 18) are interconnected about the outer portions of two of the articles (A) by a prolongation (20, 22, 24, 26, 28, 30) of said side panels located below the article gripping apertures. The carrier further comprises a partition panel (68, 68A, 72, 72A) interconnecting side walls (12, 14, 16, 18) automatically erected from a flat collapsed condition to a position of use to limit separating movement of said apertures and to provide a separating element between adjacent articles.
ARTICLE CARRIER WITH INTERNAL PARTITION STRUCTURE AND BLANK THEREFOR

The invention relates to an article carrier, which is used for securing a plurality of articles such as bottles in a group. More particularly, the invention relates to an article carrier of the top gripping type that attaches to the tops of articles thereby to secure the articles in an array.

Top gripping carriers are known. One example is shown in GB 2 038 764 which illustrates an article carrier including side wall panels extending upwardly from opposite edges of a bottom wall including one or more article receiving apertures. There further comprise opposed edges in the side walls for receiving and retaining neck flanges of the bottle. A double ply handle upstanding from the juncture of the side walls may be provided. Another example can be found in DE 8 601 261 which shows a similar top-gripping carrier where the article receiving edges are defined by apertures including flaps.

A problem associated with known top gripping carriers is that the articles tend to move around in the carrier.

Another example is shown in WO 98/06639, which shows an article carrier with a base wall structure to support portions of the article. However, such a support structure is limited to articles of a certain diameter.

The present invention seeks to overcome or at least mitigate the problems of the prior art.

One aspect of the invention provides an article carrier for securing a plurality of articles, for example bottles, which carrier comprises a pair of side walls and including article gripping means, adapted operatively to engage and retain part of an article received in an article receiving aperture, wherein said carrier further comprising an internal partition structure interconnecting the side walls capable of being automatically erected from a flat collapsed condition to a position of use to limit separating movement of said apertures and to provide a separating element between adjacent articles.
Preferably, the internal partition structure may include a panel formed from one of the side panels and is foldably connected thereto and is secured to the other said side wall. More preferably, the panel formed from one of the side panels defines in part a display face, which display window is revealed when the partition structure is placed in a set up condition. Optionally, the internal partition structure may include a glue flap hingedly connected to said panel to be secured to a second panel hinged to the other said side wall for receiving at least one article.

According to an optional feature of this aspect of the invention, wherein the side panels are interconnected about the outer portions of the plurality of articles by a prolongation of said side panels located below the article gripping apertures.

According to another optional feature of this aspect of the invention the prolongation may include a grouping strap encircling said outer portions. Preferably, the grouping strap may be integral and include fold regions to conform substantially with the shape of the said outer portions.

More preferably, the fold regions may each comprise a series of crease lines.

According to another optional feature of this aspect of the invention the article gripping means comprises an article gripping tab struck from one of the side walls and arranged to protrude into the article receiving aperture.

According to a further optional feature of this aspect of the invention there further comprises a handle structure extending upwardly from said side walls.

A second aspect of the invention provides a blank for forming an article carrier for securing a plurality of articles, for example, bottles, which blank comprises a pair of side walls and including article gripping means, wherein said article gripping means includes an article gripping tab struck from respective ones of said side walls extending in to an article receiving aperture wherein said blank further comprises an internal partition structure for interconnecting the side walls defined by a partition panel formed from one
of the side panels and hingedly connected thereto and means for securing said partition
panel to the other said side wall.

Preferably, a second partition panel formed from the other one of the side panels and is
foldably connected thereto to be secured to the first partition panel in a set up condition.
More preferably, the internal partition structure may include a glue flap hingedly
connected to said partition panel to be secured to the second panel hinged to the other said
side wall for receiving at least one article.

According to an optional feature of the second aspect of the invention the side panels may
be interconnected in the set up carrier about the outer portions of the plurality of articles
by a prolongation of the side panels located below the article gripping apertures.

According to an optional feature of the second aspect of the invention the prolongation
may include a grouping strap. Preferably, the grouping strap may be integral and includes
one or more fold regions capable of conforming substantially with the shape of the said
outer portions.

Exemplary embodiments of the invention will now be described, by way of example only,
with reference to the accompanying drawings in which:

FIGURE 1 is a plan view of a carrier blank according to one aspect of the invention;

FIGURE 2 is a plan view of the blank as shown in Figure 1 part way through a folding
process to form a flat collapsed carrier;

FIGURE 3 is a plan view of a flat collapsed carrier formed from a blank as shown in
Figure 1;

FIGURE 4 is a plan view of a carrier blank according to another aspect of the invention;
FIGURE 5 is a plan view of the blank as illustrated in Figure 4 part way through a folding process to form a flat collapsed carton;

FIGURE 6 is a plan view of a flat collapsed carrier formed from the blank as shown in Figure 4;

FIGURE 7 is a perspective view of a loaded carrier erected from the blank as illustrated in Figure 1;

FIGURE 8 is a perspective view of an erected and loaded carrier formed from the blank as illustrated in Figure 4;

Referring to Figure 1, there is shown a carton blank 10 for forming an article carrier for carrying a plurality of articles. The blank is made from foldable sheet material, for example paperboard, plastic or the like. In this embodiment, the carrier is adapted to carry articles arranged in a single row, although it is envisaged that the invention can be applied to other arrays without departing from the scope of invention.

The blank comprises a series of opposed side wall and top wall panels hinged one to the next. In this embodiment, first lower side wall panel 12, first upper side wall panel 14, top panels 52, 54, second upper side wall panel 16 and second lower side wall panel 18 are hingedly connected one to the next along fold lines 80, 82, 84, 86, 88 respectively.

There may further comprise one or more skirt panels 20, 22; and 24, 26 extending laterally from opposing side edges of lower side panel 12 and are hingedly connected thereto along fold lines 94 and 98. There may further comprise skirt panels 28 and 30 struck from opposing lower side wall panel 18 and hingedly connected thereto along fold lines 102, 104. Skirt panels 20, 22 and 24, 26 are hingedly connected together along fold lines 96, 100 respectively to assist in wrapping around a circular portion of an outer article.
Preferably, a plurality of article gripping arrangements 46, 48, 50 are provided in the top panels 52, 54 and/or the upper side panels for gripping each article. It will be seen from Figure 1 that the or each arrangement is provided with apertures 40, 42, 44 at the centre thereof to receive an upper portion of the article. The invention is not limited to one article gripping arrangement. In fact there may further comprise two or more article gripping arrangements in the carrier depending upon the number of articles to be carried. In the embodiment illustrated in Figure 1 there comprises three article gripping arrangements.

Each arrangement is substantially identical and therefore only arrangement 46 is described in more detail. The other arrangements use the same reference numerals to designate corresponding elements with the addition of the letter “a”.

Arrangement 46 comprises means for engaging the article. The engagement means in this embodiment comprises a pair of mutually opposed tabs 56, 58 formed integrally with upper side wall panels 14, 16 but struck from top panels 52, 54 respectively to extend into aperture 40. Either side of tabs 56, 58 are optionally provided with one or more flaps 60, 62, 64, 66 hingedly connected by fold lines 118, 120, 122, 124 to top panels 52, 54. It will be seen from Figure 1 that the fold lines in this embodiment are non-linear. In use the tabs 56, 58, and/or flaps 60, 62, 64, 68 are adapted to engage a portion of an article held in the carrier. One advantage of incorporating flaps 60 to 66 in to the invention is to enable the arrangement to conform better to the shape of the article in the aperture 40, thereby to improve stability. Furthermore, the flaps 50 can flex relatively the tabs 56, 58 to receive articles of different sizes.

Optionally, there may further comprise, reinforcing upper side panels 32, 34 and 36, 38 and top panels 55, 57, 59, 61 hingedly connected to the end edges of lower side and top panels 14, 16 and 52, 54 respectively along fold lines 92, 90. Corresponding engaging means 46a, 48a, 50a are provided in reinforcing panels 55, 57, 59, 61 such that the reinforcing panels are folded along fold lines 90, 92 to overlie the corresponding upper side and top panels, so that the arrangements are in register thereby to provide a double-ply gripping arrangement, to improve the strength of the carrier.
There further comprises an internal partition structure to improve the stability of the carrier by reducing unwanted movement. In this embodiment the partition structure is provided by partition panels 68 and 68a, which are struck from first upper side panel 14 and hingedly connected thereto along fold lines 114 and 110 respectively. A second pair of partition panels 72, 72a are struck from second upper side panel 16, and are hingedly connected thereto along fold lines 108 and 106 respectively. To secure each pair of partition panels together suitable securing means is used. In this embodiment, securing flaps 70, 70a are hingedly connected to partition panels 68, 68a along fold lines 112, 116.

In those embodiments with outwardly divergent side walls, each fold line 106, 108, 110, 112, 114, 116 is preferably provided at an acute angle with respect to a notional line perpendicular to the lower edges of the blank when erected in order to enable the side walls to be angled with respect to the top panels as shown in Figure 7.

The upper and/or lower side wall panels may further comprise one or more display windows to reveal a portion of the articles, for advertising purposes. In this embodiment, the display windows are formed in part from the partition panels 68, 72 when in a set up condition.

Turning to the construction of the carrier by reference to Figures 2, 3 and 7, the blank 10 requires a series of sequential folding operations to form the carrier which can be formed in a straight line machine so that the carrier is not required to be rotated or inverted to complete its construction. The folding process is not limited to that described below and can be altered according to particular manufacturing requirements.

The first stage of construction is for the carton to be formed into a flat collapsed condition. This is achieved by folding reinforcing side panels 36, 38 inwardly about fold line 90 into face contacting arrangement with respective parts of upper side panels 14 and 16. Likewise, reinforcing panels 32 and 34 are folded about fold line 92 inwardly, to be placed in face contacting relationship with another portion of upper side panels 14 and 16 to be aligned therewith. The carton is at the stage of construction illustrated in Figure 2.
Thereafter glue is applied to securing flaps 70 and 70a and the carrier is folded about its central fold line 84 in direction W so that the lower and upper side wall panels 12, 18 and 14, 16 are folded into face contacting relationship as shown in Figure 3. Skirt panels 22 and 26 are folded about fold lines 96 and 100 respectively in direction X and Y to be secured into face contacting relationship with panels 28 and 30 respectively by glue or other suitable means known in the art. The carrier is in a flat collapsed condition ready to be supplied to a user for final loading. In order to load the carrier, articles are grouped together in an array, for example one row of three articles, and the flat collapsed carrier is introduced to the group from above by relative vertical movement between the bottles and the carrier: preferably during continuous forward feed, as is well known in the art.

To load the carrier, the lower side wall panels 12 and 18 are first forced apart by suitable guide means whereby the lower side panels 12, 18 and upper side panels 14, 16 are flexed along fold lines 80 and 88 respectively. This action causes the internal panel structure to be automatically deployed. In particular, partition panels 68, 68a; 72 and 72a are folded out of alignment with respect to their adjacent upper panel portions 14, 16 respectively and securing flap 70, 70a is caused to be folded about fold lines 116, 112 respectively to form an acute angle with respect to panels 68 and 68a respectively. Thus there are a series of cells constructed to receive articles, which are inserted into the cells from below. As the articles are caused to move relative the upper portion of the carrier, the article comes into abutment with the article gripping structure. In one class of embodiments, the retention tabs 56, 58 are caused to flex outwardly relative the upper side panels 14 and 16. Support flaps 60, 62, 64 and 66 are caused to be folded about fold lines 124, 122, 118 and 120 respectively to engage the underside of part of an article A associated within each aperture thereby to retain the article within the carrier. Thus the carrier is provided in a fully loaded and erected condition as shown in Figure 7 to be supplied to a user.

A second embodiment is now described which is substantially similar to the blank and article carrier described above. Referring to Figure 4, there is shown a carton blank 210 for forming an article carrier for carrying a plurality of articles made from foldable sheet material, for example paperboard, plastic or the like. In this embodiment, the panels
forming the blank are substantially the same as the first embodiment, described above and comprises a series of opposed side wall and top wall panels hinged one to the next. Therefore like panels are denoted by the same reference numeral, but prefixed by the reference numeral '2' or for reference commencing '1xx' replaced by reference numeral '3xx'. Therefore, only the differences will be described in any greater detail.

The carrier of the second embodiment is provided with a handle structure H. The handle is formed from handle panels 215, 217, which are hingedly connected together along central fold line 285 and to top panels 252, 254 respectively along fold lines 284 and 287. Hand apertures 271 may be provided in the handle panels. The article engagement structure is similar to the first embodiment, but as there is a handle structure H there further comprises an aperture 241 to 249 above each retaining tab 256, 258. In use, these apertures receive an upper portion of the article engaged. Similarly, the reinforcing panels also include handle-reinforcing panels 263, 265, 267 and 269 foldably connected to adjacent parts of the handle panels along fold lines 290 and 292 respectively. These reinforcing panels are provided with apertures 241a to 249a that conform to the shape of corresponding apertures 241 to 249.

In this embodiment, there comprise four article-gripping arrangements provided in top panels 252, 254 and handle panels 215, 217 for gripping each article substantially as described above.

The internal partition structure differs in that there are three partition structures; the outer two correspond to those described above. The central structure is provided by partition panel 332 struck from first upper side panel 214 and hingedly connected thereto along fold lines 338. A similar securing flap 334 is hingedly connected to partition panel 332 along fold lines 340. A second partition panel 330 struck from second upper side panel 216, and is hingedly connected thereto along fold line 336.

The construction of the carrier is similar to the first embodiment and is illustrated in Figures 5, 6 and 8. However, in this particular embodiment the carton is formed by first forming the handle structure H. To this end, the first stage of construction is for the
carton to be formed into a flat collapsed condition. This is achieved by folding reinforcing side and handle panels 236, 238, 267-269 inwardly about fold lines 290 into face contacting arrangement with respective part of upper side panels 214 and 216. Likewise reinforcing panels 232 and 234 are folded about fold line 292 inwardly, to be placed in face contacting relationship with the remaining portion of upper side panels 214 and 216 to be aligned therewith. The carton is at the stage of construction illustrated in Figure 5. Thereafter, glue G is applied to securing flaps 270 and 270a and 340 and the carrier is folded about its central fold line 285 so that the handle panels and lower and upper side wall panels 212, 218 and 214, 216 are folded into face contacting relationship as shown in Figure 6 with securing flaps 270, 270a and 340. The remaining steps of construction correspond to the first embodiment.

To load the carrier, the side panels 212 and 218 are first forced apart by suitable guide means whereby the lower side panels, upper side panels are flexed along fold lines 280 and 288 respectively. This action causes the internal panel structure to be automatically deployed. In particular, partition panels 268, 268a; 272, 272a and 330, 332 are folded out of alignment with respect to their adjacent upper panel portions 214, 216 respectively. Securing flaps 270, 270a, 340 are caused to be folded about fold lines 316, 312 respectively to form an acute angle with respect to panels 268 and 268a respectively. Thus there are a series of cells constructed to receive articles that are inserted into the cells from below and are engaged and retained in the manner described above: the carrier is provided in a fully loaded and erected condition as shown in Figure 8 to be supplied to a user.

It will be recognized that as used herein directional references such as top, base, end and side do not limit the respective panels to such orientation but merely serve to distinguish these panels from one another. Any reference to hinged connection should not be construed as necessarily referring to a single fold line only: indeed it is envisaged that the hinged connection can be formed from one or more of the following: a score line, frangible connection or a fold line without departing from the scope of invention.
The present invention and its preferred embodiments relate to an article carrier which is shaped to provide satisfactory strength to hold the bottles securely but with a degree of flexibility so that the load transferred through the article retention structure is absorbed by the carrier. The shape of the blank minimizes the amount of paperboard that would be required and the article can be loaded to an array of bottles by hand and/or automatic machinery. It is anticipated that the invention can be applied to a variety of carriers and it is not limited to those of a top gripping type. For example it would be possible to use the invention for wraparound or end loaded cartons or basket type carriers in which case the internal partition structure would be adapted to facilitate easy securing of the internal partition structures. Furthermore, it is envisaged that the invention could be applied to a carrier with a different arrangement of articles, for example one row of four articles or two rows or articles, without departing from the scope of invention.
CLAIMS

1. An article carrier for securing a plurality of articles, for example bottles, which carrier comprises a pair of side walls and including article gripping means, adapted operatively to engage and retain part of an article received in an article receiving aperture, wherein said carrier further comprising an internal partition structure interconnecting the side walls capable of being automatically erected from a flat collapsed condition to a position of use to limit separating movement of said apertures and to provide a separating element between adjacent articles.

2. An article carrier according to claim 1 wherein the internal partition structure includes a panel formed from one of the side panels and is foldably connected thereto and is secured to the other said side wall.

3. An article carrier as claimed in claim 2 wherein the panel formed from one of the side panels defines in part a display face, which display window is revealed when the partition structure is placed in a set up condition.

4. An article carrier according to claim 2 or claim 3 wherein the internal partition structure includes a glue flap hingedly connected to said panel to be secured to a second panel hinged to the other said side wall for receiving at least one article.

5. An article carrier as claimed in any of claims 1 to 3 wherein the side panels are interconnected about the outer portions of the plurality of articles by a prolongation of said side panels located below the article gripping apertures

6. An article carrier according claim 4 wherein the prolongation includes a grouping strap encircling said outer portions.

7. An article carrier according to claim 5 wherein the grouping strap is integral and includes fold regions to conform substantially with the shape of the said outer portions.
8. An article carrier according to claim 6 wherein the fold regions each comprise a series of crease lines.

9. An article carrier as claimed in any of claims 1 to 8 wherein the article gripping means comprises an article gripping tab struck from one of the side walls and arranged to protrude into the article receiving aperture.

10. An article carrier as claimed in any of claims 1 to 9 wherein there further comprises a handle structure extending upwardly from said side walls.

11. A blank for forming an article carrier for securing a plurality of articles, for example, bottles, which blank comprises a pair of side walls and including article gripping means, wherein said article gripping means includes an article gripping tab struck from respective ones of said side walls extending in to an article receiving aperture wherein said blank further comprises an internal partition structure for interconnecting the side walls defined by a partition panel formed from one of the side panels and hingedly connected thereto and means for securing said partition panel to the other said side wall.

12. A blank according to claim 11 wherein a second partition panel formed from the other one of the side panels and is foldably connected thereto to be secured to the first partition panel in a set up condition.

13. A blank according to claim 12 wherein the internal partition structure includes a glue flap hingedly connected to said partition panel to be secured to the second panel hinged to the other said side wall for receiving at least one article.

14. A blank as claimed in any of claims 11 to 13 wherein the side panels are interconnected in the set up carrier about the outer portions of the plurality of articles by a prolongation of said side panels located below the article gripping apertures.

15. A blank according to claim 14 wherein the prolongation includes a grouping strap.
16. A blank according to claim 15 wherein the grouping strap is integral and includes one or more fold regions capable of conforming substantially with the shape of the said outer portions.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65D71/42 B65D71/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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Further documents are listed in the continuation of box C. Patent family members are listed in annex.

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