This invention relates to cartons or containers constructed from pre-formed foldable blanks of sheet material such as paperboard and adapted for the packaging of articles, particularly in groups of predetermined multiples, such as that employed in forming carrier cartons for canned goods and the like to which the following disclosure will be especially directed but without intent of limitation to a can package, it being understood that the carton of the invention, and the package formed therewith, may serve also for producing a salable unit of articles other than canned goods.

Thus, having reference particularly to the packaging of canned goods, such especially as canned beer, the marketing of which has been found to be particularly acceptable in carrier cartons of predetermined multiples of cans, such as the "Six-Pack," it has become an accepted practice to group the cans, in rows, in a sleeve-like, or wrap-around, carton having open ends, and to retain the rows of cans within the carton by foldable tabs or lips, or by appropriately spaced apertures, which engage the chines of the cans and restrain the cans against such movement as will permit their escape from the carton. Carrier cartons of this type, although capable of being formed from sheet material blanks of relatively small area, require the use of sheet material, paperboard for example, of relatively high quality, or heavy caliper, or both, in order that, during shipping and handling of the loaded cartons, the relatively lightweight filled cans will not lose fracture or displacement of the retaining means, thus spoiling the functional efficiency of the package and its appeal to the purchaser.

Other carrier cartons are of the fully closed, six-wall, type and these, although they may be formed from a relatively low quality and caliper of sheet material, require blanks of such relatively large area that any economy in quality and caliper is substantially offset.

Also, any carrier carton in order to be acceptable to the packager must not only be cheap but must lend itself readily to high speed packaging operations.

With the foregoing in mind, it is a purpose of the invention hereinafter to provide a carrier carton which, although highly serviceable, may be constructed from sheet material of relatively low quality and caliper and from a blank of such sheet material which is of minimum area consonant with functional efficiency.

To this end, the invention comprises a carton formed from a blank of sheet material, such as paperboard, provided with cuts and folding scores defining top and bottom walls and side walls joined to said top and bottom walls upon certain of said folding scores which extend longitudinally of the side walls and erectable to rectangular tube form upon such certain folding scores, the side walls being provided at their opposite ends with end flaps hinged upon others of said folding scores which extend transversely of said ends, each of said end flaps carrying at each of its ends a securing tab upon a folding score, and a package of articles including said carton and comprising rows of articles embraced by said top, bottom and side walls with said end flaps disposed transversely of the open ends of the carton and retained in such position by engagement of said securing tabs with said top and bottom flaps to the preceding preceding end flaps of the carton, and the invention includes also certain modifications in structure and functional assembly of the carton parts, all as will be explained hereinafter more fully and finally claimed.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated,

FIG. 1 is a plan view of the inner face of one preferred form of sheet material blank for forming the carton of the invention.

FIG. 2 is a view similar to FIG. 1, but showing the first fold made in assembling the blank to flat-folded tube form.

FIG. 3 is an exterior plan view of the completely tubular flat-folded and secured blank of FIGS. 1 and 2.

FIG. 4 is an end view of the open-ended carton erected to rectangular tube form with the end cans of two rows thereof shown in broken lines.

FIGS. 5, 6, and 7 are top plan views showing progressive steps in one mode of assembling the end flaps and securing tabs of the carton.

FIGS. 8, 9 and 10 are views similar to FIGS. 5, 6, and 7 but showing an alternative functional disposition of the securing tabs of the end flaps.

FIGS. 11, 12, and 13 are views similar to FIGS. 5, 6, and 7 but showing a modified form and functional arrangement of the securing tabs of the end flaps.

FIGS. 14 and 15 are views similar to FIGS. 11 and 13 but showing a still further modification of the securing tabs of the end flaps.

FIG. 16 is a plan view of the inner face of another form of sheet material blank for producing the carton of the invention.

FIG. 17 is an exterior plan view of the blank of FIG. 16 flat-folded to tube form.

FIG. 18 is a perspective view showing the flat-folded blank of FIG. 17 erected to rectangular tube form.

FIG. 19 is an enlarged fragmentary side view of the carton of FIGS. 16 to 18 showing the functioning of lips of the securing tabs of the end flaps to facilitate entrance of articles such as cans into the carton tube during the packaging operation.

FIG. 20 is a view similar to FIG. 17 but furthering further modification.

Referring to FIGS. 1 to 4 it will be seen that the blank of sheet material from which the carton of the invention is formed comprises a bottom wall 1 joined along folding score 2 and 3 to side walls 4 and 5 which are joined respectively along folding scores 6 and 7 with mating portions 8 and 9 of the top wall. The side walls 4 and 5 carry at both of their ends the end flaps 10, 11 and 12 hinged to them on folding scores 12, 12 and 13 and 13, and at each end of each of these end flaps is a securing tab 14 and 15, respectively, hinged to its respective end flap on a folding score 16 and 17 and separated from the adjacent portions of the bottom and top wall portions 1 and 8, 9 by cuts 18 and 19.

The top wall portion 8 is provided with depressible partially cut-out members 20, and the underlying, attached area of the top wall portion 9 is provided with recesses 21 so that when, in the squared-up carton, the members 20 are depressed finger holes will be formed for carrying.

As shown in FIGS. 2 and 3 the blank of FIG. 1 is assembled to flat-folded tube form by first folding the top wall 1 and 8 of the carton 11 and 12 upon its folding score 7 flat against the side wall 5, and then, with adhesive applied to its edge portion, as indicated by stippling in FIG. 2, or to the edge portion of the top wall element 8, the blank is folded upon the folding score 2 to bring the top wall element 8 flat against the already flat-folded top wall element 9, so that it will adhere thereon an adhesive bond, FIG. 3. Obviously, by applying inward pressure to the edges of the thus flat-folded tubular blank along the folding scores
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2 and 7 (FIG. 3) it can be erected to rectangular tube form, FIG. 4, for reception through an open end of two rows of articles (cans C as shown).

Having reference to FIGS. 6 and 7 it will be noted that in conformity with the formation of the conventional "Six-Pack," each of the two rows of cans C comprises three cans and that the combined diameters of the chimes C' of these cans is considerably in excess of the length of the top and bottom walls of the carton, the two end cans in each row (four corner cans) thus presenting portions of their upper and lower ends outside the end edges of the top and bottom walls.

When applied to free end portions of the securing tabs 14 and 15 at both ends of the carton, as indicated by stippling, FIG. 6, the end flaps 10 and 11 are swung inward upon their hinge scores 12 and 13 so that they preferably firmly contact the outer peripheries of the chimes C' of the four corner cans, and the securing tabs 14 and 15 are simultaneously depressed at the recessed top and bottom ends of these four cans and have their terminal ends slipped between the top and bottom ends of the cans and the top and bottom walls, to thus position major portions of their areas in contact with the inner peripheries of the top and bottom walls and the can ends (FIG. 7) in which final position they are retained by the adhesive bond to complete the package.

As indicated in FIGS. 8 to 10, the securing tabs 14 and 15 may be engaged in final sealing position with the exterior surfaces of the top and bottom walls, in which case the bonding adhesive will be applied to such surfaces as indicated by the stippling (FIG. 9) or to free end portions of the inner surfaces of the securing tabs.

If desired, the securing tabs 14 and 15 may be of sufficient length to have their inserted ends engage against the inner peripheries of the chimes (FIG. 13) and they may be provided with folding scores 14', 15', respectively, to aid in retaining their depressed condition in such engagement.

It will be noted that in FIGS. 11 to 13 the free ends of the securing tabs are shown as square and that, therefore, when in final position (FIG. 13), only their corners are in engagement, in point contact, with the can chimes. However, as shown in FIGS. 14 and 15 these free ends may be curved on a radius the same as, or to cooperate with, the inner peripheries of the can chimes to thereby provide for substantially full line or surface contact therewith. These securing tabs may be provided with folding scores similar in arrangement and function to the folding scores 14' and 15' shown in FIGS. 11 and 12 if desired.

As illustrated in FIGS. 16 to 20 the blank may have a full, one-piece, top wall 8' and the side wall 5 will be adhesively joined to the bottom wall 1 by a glue flap 22 to form a conventional manufacturers' seam. In this modification of the form of the blank, but not limited thereto, the securing tabs 14 and 15 may be provided at their edges with lips 23 at both ends (FIGS. 16 to 18) or only one end (FIG. 20) of the carton, and the tabs may preferably be defined from the end edges of the top and bottom walls by interrupted cuts 24. These lips 23 will serve to facilitate introduction of the articles (cans C) into the open end or ends of the carton inasmuch as they may be slidingly engaged with relatively elevated lips 25 (FIG. 19) of the packaging machine to deflect or distort the securing tabs 14 and 15 out of the way of the articles, and yet the interrupted cuts 24 will retain the securing tabs in proper ultimate alignment with the top and bottom walls until they are engaged by those mechanisms which properly position them either inwardly or outwardly of such walls during movement of the end flaps 10 and 11 to carton-end blocking position.

In an automatic packaging operation the flat blank of the carton of the invention, FIG. 1 or 16, or the modified blank of the FIG. 20 embodiment, may be employed as a so-called "wrap-around" for folding and securing around a group of articles, or it may be pre-glued as shown in FIGS. 3, 17 and 20 and squared up from flat-folded condition prior to introduction of the articles through its open end or ends. The manner of its use will be dictated in large degree by the requirements of the packager and the type of packaging machine with which it is used.

In all the forms of the invention disclosed it will be noted, again, particularly by reference to FIGS. 6, 7, 9, 10, 12, 13 and 15, that the length of the top and bottom walls is much less than the combined diameters of the articles in a longitudinal row of same. This not only has an advantage herebefore described of facilitating proper assembly of the securing tabs of the end flaps but it results in a marked saving in sheet material for the blank with the cost and sales economy which stems from such saving.

Furthermore, the fact that the articles are retained in the carton sleeve by the folding of the end flaps 10 and 11 into contact with those at the ends of the rows makes it unnecessary to employ sheet material of the relatively high quality and caliper of that now generally used in sleeve-like cartons of this general nature, thus effecting a further saving. It may be appreciated that, moreover, that, particularly in the packaging of cans, no matter whether the securing tabs 14 and 15 are disposed between the cans and the top and bottom walls of the carton, or externally of such top and bottom walls (FIG. 10), they are made to be in the wall areas at the ends of the cans used to fasten these tabs in their final position excellent support is furnished by the can ends to resist pressure applied during the period necessary for adequate setting of the adhesive. In fact it has been found in practice that the usual pressure belt travel of from forty to sixty feet necessary for the effective sealing of adhesively secured cartons of known types now used in the brewing industry for the packaging of canned beer can be reduced by substitution of the carton of the invention to only about five feet, and this on packaging machines which handle cans at the rate of about one thousand per minute.

Also, in the carton packaging of chined cans, where-in the ends of the cans are at the top and bottom of the carton and adhesive assembly seals or bonds are made at the sides and/or ends of the carton, it is difficult to obtain effective seals or bonds for the reason that, in the application of sealing pressure, the can chimes are apt to ride upon each other and thus the cans fail to provide a solid backing to properly sustain such pressure. In the sealing of the can-retaining elements of the carton of the present invention this fault is not present inasmuch as all sealing pressure is applied endwise (axially) of the cans and their tendency to ride or shift position is removed. Even if the cans should shift slightly the tops and bottoms of the cans at the ends of the rows will still provide a firm backing for the elements of the carton to which sealing pressure is applied, and this constitutes a distinct advantage over cartons of the type referred to which require the application of sealing pressure radially of the cans.

It will thus be obvious from the foregoing that the carton of the invention, and the package of articles produced with the use of such carton, have advantages over the somewhat similar cartons and packages now known, in that the carton itself requires for its production less sheet material than those now known and adapted for similar packaging operations and is therefore less expensive, is better adapted for use on modern high speed packaging machinery, lends itself better to standard sealing practices, and produces a more attractive and fault-free package.

Although adhesive has been referred to as suitable for affixing the parts of the carton both prior to and during the packaging operation, it is contemplated that stitching, stapling or taping might be used, and also that various
parts might be provided with integral locking, or interlocking, means.

Various changes and modifications are considered to be within the principle of the invention and the scope of the following claims.

What I claim is:
1. An article package including a carton having top and bottom walls and side walls joined thereto to provide an open-ended tube, and a plurality of row-arranged cylindrically shaped articles accommodated in said carton, said articles having substantially flat top and bottom ends in juxtaposition to the said carton top and bottom walls, respectively, to confine said articles against endwise movement, the length of said side walls being less than the length of the row arrangement of the articles so that the ends and sides of the end articles project beyond the end limits of said side walls, end flaps offsetting convergently from the end limits of said side walls and engaging the projecting cylindrical sides of said end articles and serving to restrain article movement endwise of said carton tube, said end flaps being provided at their upper and lower ends with securing tabs hinged only to said end flaps and initially independent from adjacent marginal portions of said top and bottom walls, said tabs being folded relative to their respective end flaps to overlie substantial areas of the top and bottom ends of the accommodated end articles and disposed in surface to surface contact with said carton top and bottom walls, and adhesive means for securing said tabs to said carton top and bottom walls, whereby substantial areas of said end article top and bottom ends provide backing surfaces to aid in effecting the adhesive bond between said carton top and bottom walls and the respective securing tabs to thus maintain said end flaps in position for their aforesaid end article engagement.

2. An article package including a carton as claimed in claim 1, in which the articles are inserted into the carton tube through an open end thereof and said securing tabs at said end of the carton tube are provided with lip means by which they may be distorted outwardly from the planes of the top and bottom walls, respectively, to facilitate entrance of the row articles past them and into the carton tube.

3. An article package including a carton as claimed in claim 1, in which said securing tabs are inserted between the inner surfaces of the top and bottom walls, respectively, and the respective ends of the row articles.

4. An article package as claimed in claim 1, in which the packaged articles are cans.

5. A can package including a carton as claimed in claim 4, in which the cans are of chime type and the securing tabs are disposed with their terminal ends in engagement with the inner peripheries of the can chimes.

6. A can package including a carton as claimed in claim 5, in which said securing tabs are provided adjacent to their terminal ends with folding score means serving to facilitate their insertion between the inner surfaces of the top and bottom walls, respectively, and the respective ends of a row end can and to insure engagement of their said terminal ends with the said inner periphery of the chimes of said can.

7. A can package including a carton as claimed in claim 5, in which the said terminal ends of the securing tabs are of arcuate shape substantially conforming to the curvature of the inner periphery of the can chime.

8. A can package as claimed in claim 4, in which there are two rows of cans and said securing tabs are disposed between the ends of the end cans of the rows and the inner surfaces of the top and bottom walls.

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