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MULTIPACK CARTON WITH END-LOCKING TABS

5 The invention relates to a carton in the form of a sleeve which has end closure panels which partially close the ends of the carton and to a blank for forming such a carton. The carton accommodates a plurality of articles, more particularly cans, which are provided with upstanding top flanges. The open-ended construction allows upper portions of the endmost cans in the carton to be exposed to view. The end closure panels are formed so that lower portions of the endmost
10 cans to be securely retained within the sleeve and locking means engage the top flanges of the endmost cans to prevent them from unauthorised removal from the sleeve or from being dislodged therefrom.

15 One aspect of the invention provides a carton accommodating a plurality of articles, such as cans provided with upstanding top flanges, which carton comprises a top panel and a base panel connected together in superposed relationship by spaced side walls thereby forming
20 a tubular structure, end closure structures to close

partially the ends of the carton to retain lower portions of the endmost articles and means to retain upper portions of the endmost articles, characterised in that each end closure structure includes opposed side end panels extending transversely of the carton end, each side end closure panel being hinged to the adjacent side wall panel by a plurality of corner panels, hinged together so that lower corners of the carton formed by said corner panels closely follow the contours of lower portions of the adjacent endmost article, each end closure structure further including a bottom end closure panel hinged to the base panel and secured in overlapping relationship to said side end closure panels, and in that said upper retaining means comprises a locking tab hinged to said top panel, which is inwardly folded into abutting relationship with that portion of the adjacent article top flange which is remote from the associated end closure structure.

According to a feature of this aspect of the invention, said locking tab may be hinged to an end edge of said top panel which is set back towards the vertical transverse mid-plane of the carton relative to a parallel vertical plane containing said bottom end closure panel. In constructions where this feature is adopted, a pair of said locking tabs may be hinged to said top panel at each of its opposite ends, the fold lines by which each pair of locking tabs are hinged to the top panel being ~~convergent~~ ^{convergent} in a direction towards the central longitudinal vertical plane of the carton.

Another aspect of the invention provides an elongate blank for forming a carton adapted to accommodate a plurality of articles, such as cans, provided with upstanding top flanges, said blank including a top panel, a first side wall panel, a base panel, and a

second side wall panel hinged one to the next, characterised in that each longitudinal end edge of said top wall includes a locking tab, hinged thereto and adapted to be folded into superposed relationship with said top panel for locking engagement with the top flange of an article when the blank is formed into a sleeve and loaded and in that each longitudinal end edge of said side wall panels includes an end closure panel hinged thereto by a plurality of mutually hinged panel strips, said side wall end closure panels at each longitudinal end edge of the blank being integrally hinged to a bottom end closure panel which is hinged to the adjacent end edge of said base panel.

According to a feature of this aspect of the invention, said top panel may include a pair of said locking tabs hinged thereto at each of its opposite longitudinal end edges, the fold lines by which the adjacent locking tabs of each pair are hinged to the top panel being convergent in a direction towards the longitudinal centre line of the blank such that when the locking tabs lie in the same plane as said top panel, said adjacent locking tabs of each pair extend convergently with respect to one another.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

FIGURE 1 is a plan view of a blank from which a carton according to the invention is formed;

FIGURE 2 is a perspective view of one end of the carton in part formed condition prior to loading; and

FIGURE 3 is a perspective view of a completed carton according to the invention.

5 Referring to the drawings, an elongate carton blank 10 formed from paperboard or similar sheet material comprises a securing strip 12, a top panel 14, a first side wall panel 16, a base panel 18 and a second side wall panel 20 hinged one to the next along transverse fold lines 22, 24, 26 and 28, respectively. The blank is symmetrical about its longitudinal centre line and therefore panel elements hinged along one longitudinal edge of the blank only are described below, it being understood that like panel elements at the opposite longitudinal edge of the blank are designated like reference numerals with the addition of suffix 'a'.
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Top panel 14 has a pair of spaced locking tabs 30, 32 and 30a, 32a hinged to each of its opposite longitudinal free end edges. The fold lines 34, 36; 34a, 36a by which the locking tabs are hinged to the top panel are convergent in a direction towards the longitudinal centre-line of the blank so that the locking tabs do not extend outwardly at right angles to the free end edges of the top panel but extend convergently towards one another. This feature is referred to again hereinafter.
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An end closure structure 38 and 38a is hinged to each of the opposite free end edges of the side wall panel 16, 20 and the base panel 18. End closure structure 38 includes a side end panel 42 indirectly hinged to the side wall panel 16 by means of corner strips 44 and 46. Corner strip 44 is hinged to side end panel 42 by fold line 48 and to corner strip 46 by fold line 50, and corner strip 46 is hinged to side panel 16 by fold line 52. Likewise, side end panel 54 is indirectly
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hinged to the side wall panel 20 by means of corner strips 56 and 58. Corner strip 56 is hinged to side end panel 54 by fold line 60 and to corner strip 58 by fold line 62 and corner strip 58 is hinged to side panel 20 by fold line 64. End closure structure 38 further includes a bottom end panel 66 which is disposed between the side end panels 42 and 54 and is hinged to the base panel 18 by fold line 68. A web panel 70 spaced from base panel 18 by aperture 72 interconnects bottom end panel 66 and side end panel 42 to each of which it is hinged by fold lines 74 and 76 respectively. Likewise, a web panel 78 spaced from base panel 18 by aperture 80 interconnects bottom end panel 66 and side end panel 54 to each of which it is hinged by fold lines 82 and 84, respectively. End closure structure 38a is of similar construction.

In order to form the blank 10 into a part completed carton C1 prior to loading, the blank is formed into a tubular structure, as illustrated by Figure 2, in which securing strip 12 is secured to side wall 20 and the blank erected so that the top and base panels 14, 18 are in parallel superposed spaced apart by side wall panels 20/12 and 16. The open-ended carton C1 is then ready for end-loading.

In the end-loading process, articles, in this case cans 'CN' are introduced in pairs through the open ends of carton C1. Immediately prior to the introduction of the first pair of cans, locking tabs 30 and 32 are folded downwardly about fold lines 34 and 36 respectively, so that they are disposed in the path of movement of the cans being loaded. The locking tabs are folded backwards into the carton by the cans and ride across the tops of the can pairs during loading until the endmost pair of cans is introduced on completion of

loading at which time the locking tabs are in superposed relationship with respect to the top panel. The locking tabs come to rest on the tops of the endmost cans such that their free ends abut against peripheral parts of the can chines and thereby lock the top ends of the cans against endwise dislodgement outwardly of the carton. The end closure structures 38, 38a are then manipulated to complete the package as shown in Figure 3. To this end, the web panels are tucked inwardly accompanied by folding of the side end panels 42 and 54 towards one another across the ends of the carton. Folding of panels 42 and 54 also is accompanied by folding along fold lines 48, 50, 52 and 60, 62, 64 so that the corner strips 44 and 46 and corner strips 56 and 58 closely follow the arcuate wall portion of the respective adjacent can of the endmost can. Bottom end panel 66 is folded upwardly and secured in overlapping relationship to both the side end panels 42 and 54. This folding and panel arrangement provides a secure end closure about lower portions of the endmost cans while the locking tabs provide the necessary retention at the upper end of the endmost cans.

In order to keep the length of the locking tabs relatively short and increase their resistance to buckling under load, each end edge of the top panel to which the locking tabs are hinged is set back towards the vertical mid-plane of the carton relative to a parallel vertical plane containing the adjacent bottom end closure panel. The vertical mid-plane is one which would notionally bisect the carton transversely. This set-back top panel feature also exposes to view a greater portion of the upper parts of the endmost cans.

The carton may be modified to accommodate only a single row of articles in like manner, or alternatively to accommodate more than two rows of articles.

5 The convergent fold lines by which the locking tabs are
hinged to the top panel, as previously referred to,
allow the locking tabs to adopt an "offset" attitude
relative to the main longitudinal axis of the carton
when the locking tabs are folded inwardly of the carton
into their locking position. Loads transmitted to the
locking tabs by the cans are therefore not normal to
the locking tab fold lines so that a component of the
load is transmitted along the fold line but are oblique
10 with respect thereto. This enhances the resistance of
the locking to buckling under load. The free ends of
the locking tabs are arcuate so as to better conform to
those flange portions of the cans against which they
abut in use.

CLAIMS

1. A carton accommodating a plurality of articles, such as cans, provided with upstanding top flanges, which carton comprises a top panel and a base panel connected together in superposed relationship by spaced side walls thereby forming a tubular structure, end closure structures to close partially the ends of the carton to retain lower portions of the endmost articles and means to retain upper portions of the endmost articles, characterised in that each end closure structure includes opposed side end panels extending transversely of the carton end, each side end closure panel being hinged to the adjacent side wall panel by a plurality of corner panels hinged together so that lower corners of the carton formed by said corner panels closely follow the contours of lower portions of the adjacent endmost article, each end closure structure further including a bottom end closure panel hinged to the base panel and secured in overlapping relationship to said side end closure panels, and in that said upper retaining means comprises a locking tab hinged to said



top panel which is inwardly folded into abutting relationship with that portion of the adjacent article top flange which is remote from the associated end closure structure.

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2. A carton according to claim 1, further characterised in that said locking tab is hinged to an end edge of said top panel which is set back towards the transverse vertical mid-plane of the carton relative to a parallel vertical plane containing said bottom end closure panel.

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3. A carton according to claim 2, further characterised in that a pair of said locking tabs are hinged to said top panel at each of its opposite ends, the fold lines by which each pair of locking tabs are hinged to the top panel being convergent in a direction towards the central longitudinal vertical plane of the carton.

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4. An elongate blank for forming a carton adapted to accommodate a plurality of articles, such as cans, provided with upstanding top flanges, said blank including a top panel, a first side wall panel, a base panel, and a second side wall panel hinged one to the next, characterised in that each longitudinal end edge of said top wall includes a locking tab hinged thereto and adapted to be folded into superposed relationship with said top panel for locking engagement with the top flange of an article when the blank is formed into a sleeve and loaded and in that each longitudinal end edge of said side wall panels includes an end closure panel hinged thereto by a plurality of mutually hinged panel strips said side wall end closure panels at each longitudinal end edge of the blank being integrally hinged to a bottom end closure panel which is hinged to the adjacent end edge of said base panel.

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5. A blank according to claim 4, further character-
ised in that said top panel includes a pair of said
locking tabs hinged thereto at each of its opposite
longitudinal end edges, the fold lines by which the
5 adjacent locking tabs of each pair are hinged to the
top panel being convergent in a direction towards the
longitudinal centre line of the blank, such that when
the locking tabs lie in the same plane as said top
panel, said adjacent locking tabs of each pair, extend
10 convergently with respect to one another.

