

A Package Structure for Storing Smoking Articles and a
Method for accomplishing the same

This application is a divisional application divided out from UK Patent Application, Publication No. 2 227 221. The claims of the latter application relate to apparatus features.

The present invention relates to storage packaging and more particularly to a storage package and a method and apparatus of making the same.

It is well known in the art of packaging one or more unit articles in an outer receptacle, such as in the tobacco arts, to utilise spacer members to compensate for dimensional differences between the inner walls of the outer receptacle and the external dimensions of the article or articles to be packaged, attention being directed to U.S. Patent No. 3,489,272 issued to S. Rosen on January 13, 1970, and to U.S. Patent No. 3,752,308, issued to C.J. Begemann on August 14, 1973, both of which disclose cartons of cigarettes in which panel spacer members are inserted to compensate for smaller packs to be enclosed within standard-sized cartons. It also is well known in the packaging art to generally assemble at least two stacked items in the same outer receptacle, such as in the cigarette packing machine disclosed by the long-expired U.S. Patent No. 1,200,227, issued to D. Pantazi on October

3, 1916, in which a coupon or ticket is assembled with a plurality of cigarettes in a pack, and to the more recent U.S. Patent No. 3,762,126, issued to W.M. Court on October 7, 1973, which relates to an article feeder for a packaging machine in which a leaflet is inserted into an open-ended carton of articles before closing the carton. Further, it is generally well known to cut and corrugate strips of material from a sheet of paper material, attention being directed to U.S. Patent No. 4,132,155, issued to A.A. Hicks on January 2, 1979. Moreover, it is generally well known to utilise rotary knives to cut continuous sheet materials and to utilise rotary wheels to feed or draw such materials, attention being directed to the two U.S. Patents No. 4,073,485 and No. 4,113,243, issued to C.G. Gregoire et al on February 14, 1978, and September 12, 1978, respectively.

In accordance with the present invention, an efficient, straightforward, comparatively light and inexpensive to manufacture and assemble, package structure for storing articles is provided, the inventive structure being particularly suitable for snugly storing foil-wrapped packages of a conventional count of thinner than normal cigarettes in standard-size cigarette packs. In addition, the present invention provides an efficient, straightforward, and comparatively inexpensive method of

manufacturing and assembling such package structures with a minimum of steps.

Various other advantageous features of the inventive package structure and method disclosed herein will become obvious to one skilled in the art upon reading the disclosure set forth herein.

The present invention provides a method of assembling a package member into a container, said container having at least one internal dimension thereof greater than a co-extending external dimension of the package member, the method comprising passing a sheet of material of preselected thickness and width from a supply zone vertically to a forming zone, shaping the sheet of material in the forming zone to a preselected breadth equivalent to the difference between the differing internal and external co-extending dimensions and to appropriate preselected perimeter to provide a shaped spacer sheet dimensioned to permit insertion thereof into the container, passing the shaped spacer sheet from the forming zone horizontally to an assembly zone to assemble the spacer sheet in stacked relation with the package member so that the overall external dimensions of the assembled package member and shaped sheet are such that the assembly can be inserted into the container in snug relation with the internal walls thereof, and inserting the so-assembled package member and stacked shaped sheet into the container, and adhesively

tacking the shaped sheet at spaced points thereon to the adjacent inner wall of the container to ensure the supporting stability thereof.

The present invention provides a package structure for storing smoking articles and produced according to the method described herein, the package structure comprising a container, a shaped package disposed in the container preselectively sized and shaped externally with at least one external dimension less than the corresponding co-extending internal dimension of the container, and at least one corrugated spacer disposed between an inner wall of the container and the package with the at least one lesser dimension, the corrugation of the spacer providing a spacer breadth equivalent to the at least one differing dimension between the package and the container whereby the assembled package and spacer are snugly disposed within the inner surrounding wall of the container, the corrugated spacer being adhesively tacked at selected spaced points to the inner wall of the container.

As used herein, the following terms have the meaning in the definition below:

"If a pack is placed in the position where the cigarettes extend vertically, the 'Y' axis is the 'length', the 'X' axis is the 'width' and the 'Z' axis is referred to as the 'breadth' or 'depth' and may also include the term 'thickness'."

Reference will now be made, by way of example, to the drawings hereof which show advantageous embodiments of the inventive manufacturing apparatus used in carrying out the inventive method and an inventive article structure wherein:

Figure 1 is a front elevational view of the inventive manufacturing apparatus, partially in schematic form;

Figure 2 is a cross-sectional side view taken through plane 2-2 of the apparatus of Figure 1, disclosing schematically additional features not shown in Figure 1;

Figure 3 is a cross-sectional side view taken through plane 3-3 of the apparatus of Figure 1, also disclosing additional features not shown in Figure 1;

Figure 4 is an enlarged front view of a corrugating roller as used in the apparatus of Figures 1-3;

Figure 5 is an end view of the corrugating roller of Figure 4; and,

Figure 6 is an exploded view of a novel article structure including a corrugated spacer sheet incorporated as part of a cigarette pack.

Figures 1-5 of the drawings disclose several views of the apparatus for forming corrugated spacer sheets from a continuous sheet of suitably thin, pliable material such as paper card stock. Figure 1 discloses a support frame means 2 in the form of a plurality of spaced uprights 3 in which are mounted vertically and selectively spaced sets of

bearing blocks; upstream bearing blocks 4, midstream bearing blocks 6 and downstream bearing blocks 7. The upstream bearing blocks 4 serve to rotatably receive a pair of horizontally spaced shafts 8 (Figure 2) which support corrugation means 9 in the form of a pair of intermeshing corrugating rollers 11 rotatably mounted thereon with their spaced axes extending horizontally to receive a suitably preselected thin sheet of pliable stock 12, such as paper card stock, which is passed over idler roll 13 from a roll 14 of such paper stock which is rotatably supported on upstream spaced vertically extending standards 16. The idler roll 13 serves to guide the sheet material 12, changing the direction of movement thereof from a substantially horizontal plane to a vertical plane where it is passed through vertically extending spaced upstream guide members 17, which are suitably spaced to permit flat sheet 12 to pass therethrough, corrugated horizontally by intermeshing corrugating rollers 11 and subsequently passed through adjacent downstream vertically extending guide members 18 which are suitably spaced to permit the now-corrugated sheet 12 to pass therethrough. As will be described more fully hereinafter, sheet 12 is drawn from supply roll 14 over idler roll 13 by the corrugating rollers 11 which are driven through a power train 19 (Figure 3). Further, the corrugating rollers 11 are designed to form corrugations in the sheet material of a

preselected depth or breadth for reasons also described hereinafter.

Referring to Figures 1 and 2, it can be seen that the suitably corrugated sheet 12 passes through spaced vertical guides 18 into a cut-off means 21 in the form of a rotary knife 22 mounted on horizontally extending shaft 23, rotatably supported on vertical standards 3 of support frame 2 by spaced bearing blocks 6. Rotary knife 22 includes a set of six equally spaced knives 24 extending around the periphery thereof to engage with steel back-up or platten roller 26 which also is horizontally and rotatably mounted on support frame 2 in an appropriately spaced position relative to the horizontally extending rotary knife 22 to allow corrugated sheet material 12 to pass therebetween with knives 24 serving to cut corrugated sheet material 12 of selected length at appropriately spaced intervals to form corrugated spacer sheets 27 of a desired preselected size.

Once a sheet 12 is cut to length to form corrugated spacer sheet 27 by the aforescribed cut-off means 21, a take-off means 28 mounted on support means 2 in preselected, spaced downstream relation from cut-off means 21 serves to take off corrugated spacer sheet 27 for further assembly operations. Take-off means 28 includes a rotary wheel 29 mounted on a rotatably mounted, horizontally extending shaft 31 which is rotatably

supported on the vertical standards 3 by the downstream bearing block 7 aforescribed. Rotary wheel 29 includes a flexible, peripheral blade 32, which can be of a suitable rubber or flexible plastic material, mounted and gripped by spaced rotary side plates 33 which are mounted to rotary shaft 31. Spaced from and co-operatively positioned relative flexible blade 32 is curved guide member 34. Guide member 34 co-operates with blade 32 to reorient a corrugated spacer sheet 27 from a vertical to a horizontal position. At this point, a packer lug 36 (Figure 1) is actuated by suitably synchronous mechanism (not shown) to move spacer 27 to a further assembly operation where it is assembled with a wrapped package and inserted into a container, as will be described more fully hereinafter.

Referring particularly to Figures 1 and 3 of the drawings, it can be seen that aforescribed power train means 19 which drives and feeds sheet material 12, connects corrugating means 9 in the form of spaced corrugating rollers 11, cut-off means 21 in the form of rotary knife 22, knives 24 and back-up roller 26, and take-off means 28 in the form of rotary take-off wheel 29 and flexible gripping blade 32 by a suitable gear and belt assembly mounted on support frame 2 to drive and feed the sheet material in synchronous operation. Any one of a number of suitable power drives can be employed and so timed in synchronous operation to make a corrugated spacer of

preselected size, and in the embodiment of Figure 3 suitable drive means, power train means 19 and appropriately sized gears, belts and idlers connecting the several aforescribed shafts 8, 23 and 31, is disclosed as belt 38 connected to a main drive source 36.

In this regard, and in a typical example, main drive source 36 (Figure 3) can be connected to an 18-tooth sprocket 37 to move the sprocket at 100 RPM. Sprocket 37, in turn, is connected by belt 38 to a 27-tooth sprocket 39 which is driven at 66.6 RPM to drive a 48-tooth gear 41 also at 66.6 RPM. Gear 41, through idler gear 42, drives a 64-tooth gear 43 connected to the corrugating roller shaft 8 at 18.75 RPM. Gear 43, in turn, through idler gear 44, drives a 72-tooth knife gear 46 mounted on shaft 23 at 16.5 RPM. Knife gear 46, in turn, is connected to a 32-tooth timing gear 47 driven at 74 RPM. The shaft 49 for steel back-up roller 26 is connected to timing gear 47 to be driven through a 16-tooth gear also at 74 RPM. A belt 51 connects gear 47 through sprocket 52 on shaft 31 to drive the take-off wheel 32 at 100 RPM. Suitable take-up sprockets 53, 54, and 56 are utilised in engagement with belts 38 and 51 respectively to adjust belt tension properly. It is to be understood that any one of a number of other type drive assemblies can be used besides that described herein without departing from the disclosed invention.

In accordance with a further feature of the present invention, the above-described inventive apparatus can be employed in a novel method of snugly assembling a package member, which can be in the form of a foil-wrapped rectangular package 61 of thin cigarettes 62 as disclosed in Figure 6 of the drawings, into an open-ended container such as the open-ended cardboard container or pack of rectangular shape 63, as also disclosed in Figure 6. Cigarette container 63, as disclosed, is one having conventional internal length, width and breadth dimensions, so as to accommodate a foil-wrapped package of regular or conventional cigarettes which would snugly fit into container 63. In the embodiment disclosed, foil-wrapped rectangular package 61 is of thin cigarettes 62 with an external length and width equivalent to the internal length and width of container or pack 63. However, the internal breadth of container 63 is greater than the breadth of foil-wrapped rectangular package 61 and, as a consequence, the package 61 would not be in snug relation with pack 63 when inserted therein. To accommodate for this and pursuant to the present invention, a suitable sheet of material such as card stock is stored as a roll 14 in a supply zone where it is supported by the spaced standards 16. This sheet of material is carefully sized in width so that such width dimension provides spacer 27, described hereinafter having a length after shaping less than the

internal length of container 63 so as to minimise the amount and weight of spacer material required but at the same time being of a length sufficient to ensure spacer stability. The sheet of material 12 is drawn from a horizontal plane at an angle acute to the horizontal plane over idler roll 13 downwardly in a vertical direction through spaced upstream guides 17 and by and through the corrugating means 9 of a forming zone where the sheet is corrugated by intermeshing corrugating rollers 11 with corrugations extending horizontally and normally to the vertical line or direction of movement of sheet 12. In this regard, the corrugation by rollers 11 are of a breadth equivalent to the difference between the breadth of the wrapped rectangular package of cigarettes 62 and the internal breadth of container 63. The corrugated sheet 12 is then passed downwardly in the same vertical plane through spaced downstream guide members to a cut-off zone where the sheet is cut by cut-off means 21 into spacer sheets 27 which, when oriented through 90° with corrugations extending lengthwise and assembled with the foiled package 61, have a width equivalent to the internal width of container 63 and the external width of package 61. Each corrugated spacer 27 is passed to a take-off zone through friction grip and guide means in the form of take-off wheel 29 and curved guide 34, the plane of orientation of spacer 27 again being changed, this time from vertical

to horizontal. The spacer 27 is then passed to any one of several types of known assembly zones (details of which are not disclosed) where it is stacked with a wrapped cigarette pack 61 with its corrugations extending along the length of the package and the width of spacer sheet 12 being co-extensive with package 61. A suitable tacking adhesive is applied at spaced points along corrugated spacer 27 to avoid collapse at the corrugations and on the foil wrapper of package 61 and the assembled and stacked spacer 27 and cigarette package 61 are inserted into container 63 to snugly fit therewith with the adhesive tacking agent adhering to the adjacent inner walls of container 63 to ensure the snug supporting stability of the corrugated spacer sheet 27.

Thus, in accordance with the above-described method and apparatus, a package structure for storing thin cigarettes in a conventional pack is provided including, as shown in Figure 6 of the drawing, an open-ended stiff paper pack or container 63 of rectangular shape with preselectively conventionally sized internal length, width and breadth dimensions. Disposed within container 63 is a stack assembly including a rectangular package 61 of foil-wrapped, thin cigarettes 62, the package 61 having external length and width dimensions equivalent to the internal length and width of container or pack 63 but, because of the nature of the thin cigarettes, a breadth less than the

internal breadth of container 63. To compensate for this difference in breadth, corrugated paper card stock spacer 27 is provided as part of the stacked assembly to be disposed between an inner face wall of pack 63 and an external face wall of foil-wrapped package 61. The width of spacer 27 is equivalent to the internal width of pack 63 and the external width of package 61. The length of spacer 27 is less than the equivalent lengths of the pack 63 and package 61, and the breadth of the spacer is equivalent to the difference in breadth between pack or container 63 and package 61. Thus, the assembled package of spacer 27 and package 61 fits snugly within pack 63 with corrugations extending lengthwise along the pack and a portion of the package length. As above discussed, to add to the stability of the overall structure during consumer usage, both spacer 27 and foil-wrapped package 61 are adhesively tacked at preselected spaced points to the opposed inner face walls of pack 63.



C L A I M S

1. A method of assembling a package member into a container, said container having at least one internal dimension thereof greater than a co-extending external dimension of said package member, the method comprising passing a sheet of material of preselected thickness and width from a supply zone vertically to a forming zone, shaping said sheet of material in said forming zone to a preselected breadth equivalent to the difference between said differing internal and external co-extending dimensions and to appropriate preselected perimeter to provide a shaped spacer sheet dimensioned to permit insertion thereof into said container, passing said shaped spacer sheet from said forming zone horizontally to an assembly zone to assemble said spacer sheet in stacked relation with said package member so that the overall external dimensions of said assembled package member and shaped sheet are such that said assembly can be inserted into said container in snug relation with the internal walls thereof, and inserting said so-assembled package member and stacked shaped sheet into said container, and adhesively tacking said shaped sheet at spaced points thereon to the adjacent inner wall of said container to ensure the supporting stability thereof.



2. A method according to Claim 1, wherein said sheet is shaped in said forming zone by corrugation and cutting steps.
3. A method according to Claims 1 or 2, wherein said sheet is shaped in said forming zone by respectively successive corrugation and cutting steps.
4. A method according to any one of the preceding claims, wherein said sheet of material is drawn from said supply zone through said forming zone.
5. A method according to any one of the preceding claims, wherein said sheet of material is drawn from said supply zone through said forming zone by a corrugation step to be subsequently passed to a cutting zone to provide said shaped spacer sheet with appropriate dimensions to permit insertion into said container.
6. A method according to any one of the preceding claims, wherein said shaped spacer sheet of material is passed from said forming zone to said assembly zone through a friction grip and guide means which changes the plane of orientation of said shaped spacer sheet.
7. A method according to any one of the preceding claims, wherein said sheet of material in said supply zone is in roll form with a preselected width of a dimension which provides a preselected dimension after shaping not greater than the corresponding internal width dimension of said container.



8. A method according to any one of the preceding claims, wherein said sheet of material in said supply zone is of paper card stock.
9. A method according to any one of the preceding claims, wherein said container is of rectangular shape with internal length and width dimensions thereof equivalent to the external length and width dimensions of said packaged member and with the breadth thereof greater than the breadth of said packaged member, whereby said assembled package member and said shaped spacer sheet of preselected breadth fit snugly into said container after insertion of said assembly therein.
10. A method of assembling a wrapped rectangular package of cigarettes into a container of substantially rectangular shape having internal length and width dimensions equivalent to the external length and width dimensions of said wrapped cigarette package, said container having a breadth greater than the breadth of said wrapped rectangular package of cigarettes, the method comprising storing a sheet of card stock material in roll form in a supply zone, said sheet of material having a preselected width of a dimension which provides a preselected length after shaping less than the internal length of said container, drawing said sheet of card stock material from a horizontal



plane at an angle acute to the horizontal plane over an idler roll downwardly in a vertical plane by and through a corrugating means in a forming zone to corrugate said sheet with corrugations extending horizontally and normally to the vertical line of movement of said sheet, said corrugations being of a breadth equivalent to the difference between said external breadth of said wrapped rectangular package of cigarettes and the internal breadth of said container, passing said corrugated sheet downwardly in a vertical plane to cut said corrugated sheet into corrugated spacer sheets of preselected width equivalent to the internal width of said container, passing each of said shaped corrugated spacer sheets of preselected length, width and breadth through a friction grip and guide means to change the plane of orientation of said sheet to horizontal to be passed from said forming zone to an assembly zone, stacking each of said corrugated spacer sheets with a wrapped cigarette package, the corrugations of said spacer sheet extending along the length of said package and the width of said spacer sheet being co-extensive with the width of said cigarette package, applying a suitable adhesive tacking agent at spaced points along said spacer sheet, and inserting said assembled and stacked spacer sheet and cigarette package into said



container to snugly fit therewith with the adhesive tacking agent adhering to the adjacent inner walls of said container to ensure the snug supporting stability of said corrugated spacer sheet.

11. A package structure for storing smoking articles and produced according to the method of any one of Claims 1 to 10, said package structure comprising a container, a shaped package disposed in said container preselectively sized and shaped externally with at least one external dimension less than the corresponding co-extending internal dimension of said container, and at least one corrugated spacer disposed between an inner wall of said container and said package with the at least one lesser dimension, the corrugation of said spacer providing a spacer breadth equivalent to the at least one differing dimension between said package and said container whereby said assembled package and spacer are snugly disposed within the inner surrounding wall of said container, said corrugated spacer being adhesively tacked at selected spaced points to the inner wall of said container.

12. A package structure according to Claim 11, said container and said package disposed therein being of rectangular shape with their respectively internal and external length and width dimensions being equivalent



and their respective internal and external breadth dimensions being different, and said corrugated spacer having an equivalent width dimension, a length dimension not exceeding the corresponding length dimension of said internal and external length dimensions of said container and package respectively and a breadth equivalent to the difference between the respective breadths of said internal container and external package.

13. A package structure according to Claim 11 or 12, said corrugated spacer being of paper card stock.
14. A package structure according to any one of Claims 11 to 13, said container being a stiff, paper tobacco pack and said package being a foiled wrapper containing a plurality of smoking articles.
15. A cigarette package structure for storing cigarettes comprising a stiff paper pack of rectangular shape having preselectively sized internal length, width and breadth dimensions, a rectangular package of foil-wrapped cigarettes disposed in said pack, said wrapped package of cigarettes having external length and width dimensions equivalent to said internal length and width dimensions of said pack and a breadth less than the internal breadth of said pack, and a corrugated paper card stock spacer disposed between an inner face wall of said rectangular pack and a face wall of said



wrapped package of cigarettes, the width of said spacer being equivalent to the equivalent width of said pack and package, the length of said spacer being less than the length of said equivalent pack and package length, and the breadth of said spacer being equivalent to the difference in breadth between said pack and said package, whereby said package fits snugly within said pack, the corrugations of said spacer extending lengthwise of said pack and package, with said spacer and said foil-wrapped package being adhesively tacked at preselected spaced points to the opposed inner face walls of said pack.

16. A method of assembling a package member into an open-ended container substantially as hereinabove described with reference to Figures 1, 2, 3, 4 and 5 of the diagrammatic drawings hereof.
 17. A package structure for storing articles substantially as hereinabove described with reference to Figure 6 of the diagrammatic drawings hereof.
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