(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 401 727 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
21.06.2006 Bulletin 2006/25

(21) Application number: **02746266.2**

(22) Date of filing: **03.07.2002**

(51) Int Cl.:
B65D 71/42 *(2006.01)*

(86) International application number:
PCT/SE2002/001318

(87) International publication number:
WO 2003/004377 (16.01.2003 Gazette 2003/03)

(54) **A CARRIER FOR CANS, A CARDBOARD BLANK FOR A CARRIER FOR CANS AND A METHOD TO ASSEMBLE A CARDBOARD BLANK**

TRÄGER FÜR DOSEN, KARTONZUSCHNITT FÜR EINEN TRÄGER FÜR DOSEN UND VERFAHREN ZUM ZUSAMMENFÜGEN EINES KARTONZUSCHNITTS

SUPPORT POUR BOITES-BOISSON, EBAUCHE EN CARTON POUR LE SUPPORT DES BOITES-BOISSON ET PROCEDE D'ASSEMBLAGE D'UNE EBAUCHE EN CARTON

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LU MC NL PT SE SK TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **03.07.2001 SE 0102379**

(43) Date of publication of application:
31.03.2004 Bulletin 2004/14

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(56) References cited:
US-A- 3 194 476
US-A- 5 355 999
US-A- 5 443 153
US-A- 5 469 687

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EP 1 401 727 B1

Description

Field of the invention

[0001] The present invention relates to a carrier of cardboard, preferably corrugated cardboard, for connecting a plurality of generally cylindrical cans being disposed in at least two rows and having an inclined upper part and a top closure with a projecting circular rim. The carrier is produced from a plane blank, having, for each can connected by the carrier, two mutually opposing, essentially arcuate slits, the outer edges of which engage below the rim of the cans when the carrier is assembled on the plurality of cans to connect the carrier and the cans and form a package assembly.

[0002] The invention also relates to a plane blank of cardboard for a carrier for cans and a method to assemble a plane blank of cardbord.

Background of the invention

[0003] Cylindrical cans are used in the beverage industries for drinks, such as for instance mineral water, bear and soft drinks. For carrying a plurality of cans, package assemblies are provided, which may comprise from two up to ten cans. Heretofore there have been many different types of package assembly means provided for enabling a plurality of cans to be lifted and handled by, for example, a consumer.

[0004] Plastic materials are used as package assembly means, e.g. in the form of a plastic film wrap extending around the packaged cans or in the form of mutually connected plastic rings which are applied around the cans. These package assembly means, however, are costly and cause environmental problems. Other types of carriers for cans, made of cardboard, having both environmental and commercial advantages, have thus been introduced. Also combinations of plastic and cardboard materials have been used as package assembly means.

[0005] Considering the extensive use of package assemblies for drinks and the great quantity of cans sold in these packages or assemblies, the cost of the individual package, including material as well as assembly costs, is an important factor in the cost of the packaged assembly as sold. Hence, relatively small changes in the costs of the package assemblies are very important. In addition, it is important that the contents of the packages are clearly visible and can be identified in the package assembly.

[0006] One type of carrier of cardboard configured as a banderole or a so called wrap-around extending around the group of cans are frequently used and is, for example, disclosed in US-A-3,194,476. This wrap-around carrier is costly and complicated to apply around the cans in a continuously running production line. A further disadvantage is that the contents of the package can not easily be identified by the consumer.

[0007] Other types of carriers of cardboard are known, which are adapted to be applied against the upper side of the group of containers and to be connected to the containers. A carrier of this type is described, for example, in US-A-3,094,210. The carrier is produced from a plane cardboard blank having two opposing U-shaped slits for each container to be connected by the carrier. The plane blank is assembled on the group of containers by folding side flanges downwardly towards the sides of the container, such that outer edges of the slits in the carrier engage below the shoulder of the containers. However, in order to prevent the edges of the slits to disengage from the shoulder, following mutual movements between the containers, an additional corresponding carrier must be applied on the bottom part of the containers. The carrier as described above is disadvantageous in that it can be used for a single row of containers only and is costly due to material costs and a more complicated assembly of a two-piece carrier. A further disadvantage is that the side flanges of the carrier projecting downwardly along the sides of the containers, may easily get caught by an adjacent package assembly or some other element, such that the flanges are forced upwardly and the edges of the slits are disengaged from the shoulder of the container.

[0008] A similar carrier for cans is disclosed in EP-B-0496807. The carrier comprises two opposing arcuate slits for each can and short incisions extending radially from said slits. A plurality of flaps, formed between the incisions, engage below the projecting neck of the cans. Grasping flaps are provided on each side of the carrier adapted to be folded when the carrier with the cans is grasped and lifted by the user. The carrier as disclosed has proven insufficient to securely engage the carrier on the cans, especially when lifting forces are applied in the gripping recesses in the sides of the carrier. The carrier has a centrally arranged folding line, which serves as a "hinge " when the lifting forces are applied in the gripping recesses in the opposing sides of the carrier, such that the cans are separated and tend to disengage from the carrier. In addition, the side flaps are forced by the lifting forces in an upward direction, thus further increasing the risk for disengagement of the carrier from the cans.

Basic idea of the invention

[0009] The object of the present invention is to solve the above-mentioned problems by providing a carrier, for a plurality of cans disposed in at least two rows, which may be securely fitted to the cans in order to connect, lock and support the cans and provide a package assembly which may be lifted and handled without risking disengagement, and which is material-effective and may be readily and effectively applied to and assembled on a plurality of cans.

[0010] This object is achieved in accordance with the invention in a carrier for cans, a cardboard blank and a method to assemble a cardboard blank as described above and with the characterising features as defined in

the appended claims.

[0011] In accordance with the invention, gripping recesses are disposed between the rows of cans and a bowl-shaped indentation is formed in the carrier between the gripping recesses and the rows of cans. The plane blank has a central portion intended to be accommodated between the rows of cans in the assembled state, which portion is slightly wider than the actual spacing between the cans, such that indentations are formed between the rows of cans when the carrier is assembled on the cans. The assembled carrier according to the invention is stiffened by the centrally disposed bowl-shaped indentations, such that the cans are steadily supported in the carrier. The lifting forces, applied in the gripping recesses between the rows of cans, are distributed in the direction of the engagement tongues in the inner slits, such that the abutting pressure on and below the rim of the can is increased. In forming the bowl-shaped indentation in the centre of the plane blank, the engagement tongues in the outer slits abutting the rim of the can, are forced towards the centre of the package assembly, thus increasing the pressure of the engagement tongues in the outer slits on the rim of the can and tightening the connection of the carrier to the cans. By these means, a steady and secure connection of the cans in the carrier is achieved. According to a preferred embodiment of the invention, opposing arcuate slits for each can to be connected by the carrier comprise an arcuate intermediate section between two arcuate end sections. The intermediate section is formed radially inside the arcuate end sections of the slit, such that an engagement tongue is formed in the intermediate section of the slit. The engagement tongue is adapted to slip over the projecting rim of the can when the side panels and the centre portion of the blank are forced towards the inclined sides of the can and to snap in below the rim to securely and effectively lock the carrier to the cans. The curvature of the engagement tongue thoroughly follows the curvature of the can and through the deflection of the end sections of the slits and the ensuing tension is these sections, the engagement tongues are tightened to provide a secure and steady connection.

[0012] The foregoing and other objects and advantages of the invention will be made more apparent in the following description of embodiments of the invention and in the appended drawings.

Short description of the drawings

[0013] The invention will be described more in detail below with reference to the appended drawings, in which

Figure 1 shows a plane cardboard blank for a carrier for cans according to an embodiment of the invention, said carrier being adapted for two rows of cans with six cans,

Figure 2 shows in a perspective view a package assembly comprising a carrier with six cans, the carrier being produced from the cardboard blank of Figure 1,

Figure 3 shows a sectional view of the package assembly of Figure 2 along the line III-III in Figure 2,

Figure 4 shows a sectional view of the package assembly of Figure 2 along the line IV-IV in Figure 2, and

Figure 5 shows a plane cardboard blank for a carrier for cans according to a second embodiment of the invention, said carrier being adapted for two rows of cans with four cans.

Detailed description of embodiments of the invention

[0014] The carrier according to the invention is produced from a plane blank of cardboard, preferably corrugated cardboard. A thin and compact F-flute corrugated cardboard is preferably used. However, a thicker E-flute corrugated cardboard may also constitute a suitable material in the carrier. In order to minimise the humidity effect on the material, the corrugated cardboard may be coated with a plastic layer, preferably on its inner side. Besides that the plastic layer increases the resistance of the material against moisture, the layer also increases the ductility of the material. The advantages of the environment friendly corrugated cardboard remain also with a plastic coating, since the plastic material in the coated layer may be recycled.

[0015] Figure 1 shows the plane cardboard blank 32 for a carrier according to an embodiment of the invention. The carrier is adapted to connect and hold a plurality of cans 4 disposed in two rows, as shown in Figure 2. The blank 32, in the embodiment as shown adapted for six cans 4, is shown in the assembled state in Figures 2 - 4. The cans 4, which do not form part of the present invention, are conventionally designed with an essentially circular-cylindrical basic form. The upper part of the can is slightly inclined and is closed by a top closure 6 which is sealed by means of a projecting circular rim 8.

[0016] The plane blank 32 has an essentially rectangular basic form, preferably with dented or inclined corners 10, for reducing the risk that a projecting part of the carrier may get caught by an adjacent element, such as for example another package assembly. At least two gripping recesses 42 are centrally disposed in the blank between the rows of cans 4. In the embodiment as shown, the gripping recesses 42 are formed as oval openings and provide a secure finger grip for two fingers to lift and handle the package assembly. The gripping recesses 42 may, however, be circular or be formed differently and may be provided with a foldable flap 43, as shown in Figure 1. The foldable flaps 43 are adapted to be folded backwards between the cans in order to provide a reinforced and fingergrip-friendly lifting edge in the gripping recess 42. In Figure 2, the foldable flaps 43 have been folded back underneath the carrier between the cans.

[0017] Two mutually opposing and essentially arcuate slits 44, 45 are disposed in the blank 32 for each can 4 to be connected by the carrier 31. Each pair of slits com-

prises an outer slit 44, preferably having a first configuration, and an inner slit 45 adjacent to a centre line 34 between the rows of cans, having a second configuration.

[0018] The outer slit 44 in each pair of slits consists of an arcuate intermediate section 16 having arcuate end sections 18 on both sides thereof. Step-like portions 20 are disposed between the intermediate section 16 and the end sections 18. The arcuate end sections 18 are part circular, the radius of which is equal to or slightly larger than the radius of the projecting rim 8 of the top closure 6, such that the edge of the end sections 18 in the assembled state is in line with or projects slightly outside the edge of the shoulder 8, as shown in Figure 2. The outer edge of the slit 44 may thus, along the end sections 18, easily be displaced downwardly past the rim 8, as will be explained more in detail below.

[0019] The arcuate intermediate section 16 of the slit 44 is formed radially inside the extended arcuate end sections 18 of the slit, such that the intermediate section forms an arched edge inside the arched line formed by the extensions of the two end sections 18. The arched edge of the intermediate section 16 with its step-like end portions 20, thus forms a projecting engagement tongue 22 directed towards the centre of the blank. As mentioned above, the engagement tongue 22 is arched and may be part circular, the radius of which corresponds to the radius of the can just below the rim. The engagement tongue 22 may also be differently arched, for example, the arc may be part circular and "wider". This engagement tongue 22 has a larger radius and a centre which does not coincide with the centre of the cans in the assembled state of the carrier. The engagement tongue is adapted to snap in below the projecting rim 8 of the can 4 to connect and lock the can to the carrier, as will be described further below.

[0020] The inner slit 45 differs from the outer slit 44, primarily in the design of the intermediate section 46, but also in that the arcuate end sections 48 are smaller than the corresponding end sections 18 in the outer slit 44. As a consequence, the intermediate section 46 of the inner slit is larger than the corresponding intermediate section 16 in the outer slit 44.

[0021] The intermediate section 46 of the inner slit 45 has at least one, in the embodiment as shown two, radially extending incisions 47. The incisions 47 extend between the edge of the slit 45 and an arcua te folding line 53, extending between the end sections 48 and delimiting an engagement tongue between the step-like portions 50. The incisions 47 divide the engagement tongue into three engagement flaps 52. The curvature of the intermediate section 46 of the slit 45 differs from the curvature of the arcuate folding line 53 in that it is wider and has a larger radius that the folding line 53. As a consequence, the height of the engagement flaps 52 varies, such that it is higher in the centre of the engagement tongue and decreases continuously towards the ends of the engagement tongue, as shown in Figure 1. The arcuate folding line 53 is configured to correspond with the curvature of the contact line on the inclined surface of the can, as will be described more in detail below with reference to Figures 2 - 4.

[0022] As shown in Figure 1, a plurality of additional folding lines are disposed in the blank 32. Three longitudinal folding lines 54, for each row of cans, extend parallel to the long sides 56 of the blank and to the rows of the cans. Two of the three longitudinal folding lines 54 connect the ends of the arcuate slits 44, 45 with each other or with an adjacent short side 58 of the blank and the third folding line 54 connects the step-like portions 20 in the outer slits 44 with each other or with an adjacent short side 58 of the blank. In addition, a plurality of folding lines 55 are disposed in the centre portions of the blank, said folding lines in the embodiment as shown being oblique and are disposed between the rows of cans in the blank. The oblique folding lines 55 connect the outer engagement flaps 52 with an adjacent gripping recess 42 or with an adjacent short side 58 of the blank. Portions 62, 64 of the plane blank are formed between the oblique folding lines 55, the arcuate folding lines 53 and the gripping recesses 42 or the side edges 58 of the blank. A width b, see Figure 1, of said portions 62, 64, extending between a pair of adjacent arcuate folding lines 53, is slightly larger than a spacing a, see Figure 3, extending between the contact lines of the adjacent arcuate folding lines 53 on the inclined surfaces of the cans in the assembled state of the carrier, as will be described more in detail below.

[0023] The plane blank 32, in the preferred embodiment made of corrugated cardboard, is punched out of the corrugated material such that the direction of the flutes of the corrugated material (marked with a double arrow 65 in Figure 1) coincides with the direction of the engagement tongues 22, 52. Through this orientation of the flutes, the engagement tongues may withstand a maximum of compressive force.

[0024] The outer dimensions of the plane blank 32, i.e. the length and the width of the blank, are chosen such that the side edges of the assembled carrier, with its side panels 60 being folded towards the inclined surfaces of the cans, do not exceed the maximum outer dimensions of the group of cans. As a consequence, the risk of an unintentional disengagement of the carrier from the cans due to upwardly directed forces on the side panels or other parts of the blank, is considerably reduced.

[0025] The plurality of cans 4, disposed in two rows, are connected and held together by the carrier 31 in a package assembly, as shown in Figures 2 - 4. In forming the carrier as shown in Figure 2 from the plane blank 32 of Figure 1, the plane blank is first superimposed on the group of cans. The essentially circular portions of the blank disposed between the opposing slits 44, 45 bear on and cover the top closures 6, such that the slits 44, 45 in the blank on the whole coincide with the projecting rim of the can. Then, pressure is applied against the plane blank.

[0026] Pressure is first applied against the side panels

60 on the outer sides of the group of cans, said panels being forced in a downward direction. Through the downwardly directed pressure, the blank 32 is folded in the folding lines 54. The side panels 60 are thus folded in two steps in the parallel folding lines 54 towards the inclined surface on the upper part of the cans 4, as shown in Figure 3. The arcuate end sections 18 of the outer slits 44 are displaced in a downward direction past the rim 8 of the can and the projecting engagement tongue 22 is turned slightly upwards. Hence, the arcuate end sections of the slit 44 pass outside the projecting rim 8 and the engagement tongue 22 slips over and snaps in below the rim 8, to connect and lock the carrier to the cans. The arcuate engagement tongue 22 is formed to fit the cylindrical curvature of the can 4, such that the entire tongue 22 bears on the surface of the can below the rim 8 and exerts a tightening force ensuing from tensions distributed in the carrier along the outer edges of the end sections 18 of the slits from the contact pressure of the carrier 1 on the top closure 6, such that a secure and stable connection between the carrier and the cans is achieved.

[0027] As shown in Figure 2, the upper plane parts of the assembled carrier, cover the upper portions of the cans 4, i.e. the top closures 6, such that these portions are protected from contamination during transportation and storing.

[0028] In a subsequent assembly step, preferably a special pressure-applying tool with individually spring-loaded rolls, applies pressure in the the centre 34 of the blank, especially in the portions 62, 64. The pressure is preferably applied at certain points in the blank, however with a certain longitudinal extension, forcing the portions 62, 64 in a downward direction. Through the pressure, the blank is folded in the longitudinal inner folding lines 54, such that the outer edges of the inner slits 45 are displaced downwardly past the rim 8 of the can. In addition, the blank 32 is folded in the oblique folding lines 55 and in the arcuate folding lines 53. The downward pressure is applied, such that the arcuate folding lines 53 are forced against the inclined surfaces of the cans, and the engagement flaps 52 are folded upwards and snap in below the rim 8 of the can into a locking position. The downward pressure is applied in central portions 62, 64 between the pairs of cans, thus forming bowl-shaped indentations 66, 68 between the oblique folding lines 55 and the arcuate folding lines 53. Figure 4 shows that the bottom level of each bowl-shaped indentation 66, 68 is formed centrally between each pair of cans and that the top level of the bowl is formed at the edge of the gripping recesses 42. The level of the bowl-shaped indentation 68 at the edge of the carrier 31 is slightly lower than the top level at the edge of the gripping recess 42. The bowl-shaped indentations 66, 68 are obtained by means of the oversized width b in the central portions 62, 64 of the blank and the declining height of the engagement tongue towards its ends and also the oblique folding lines 55. In this assembly step, i.e. when the bowl-shaped indentations 66, 68 are formed, the spacing between the outer slits 44 in the carrier is slightly reduced. As a result, the pressure of the engagement tongues 22 on the rim 8 are increased by means of the tightening forces from the central portions 62, 64. From this assembly step, the cans 4 are held and supported in the package assembly in a steady and secure engagement by the carrier.

[0029] When the carrier 31 of Figure 2, with its heavy load of liquid-filled cans 4, is lifted by a two finger grip in the gripping recesses 42, the lifting force L is applied in the carrier between the rows of cans 4. Through the bowl-shaped indentations 66, 68 in the portions 62, 64 between the rows of cans 4, a stiffening of the central portions of the carrier is obtained. The stiffening of the central portions of the carrier prevents that these portions are forced upwardly by the upwardly directed lifting forces L, such that the tongues would be disengaged from the cans. Unlike the carriers of the prior art, in which the lifting forces tend to disengage the carrier from the cans, the lifting forces L in the carrier according to the invention are partly transformed to forces F tending to press the cans together (see Figures 3 and 4) and partly the lifting forces L in the gripping recesses 42 are distributed in the direction of the oblique folding lines 55 and are transformed to an increased pressure of the engagement flaps 52 on the rim 8, such that the cans are held steadily by the carrier and are securely connected by the carrier. The bowl-shaped indentations, the gripping recesses provided centrally between the rows of cans and the projecting arcuate engagement tongues in the carrier according to the invention, contribute to a secure and steady connection of the cans, a stiffening of the assembled carrier and a transformation of the lifting forces to an increased engagement pressure, an increased tightening of the carrier and a reduced tendency of movements of the cans in the carrier.

[0030] Figure 5 shows a second exemplifying embodiment of a cardboard blank for a carrier for four cans in two rows of cans. Opposing pair of slits 44, 45 in the blank for each can to be connected by the carrier and folding lines are disposed in a corresponding manner as in the blank as shown in Figure 1. Two gripping recesses 42 are disposed in the blank. One gripping recess 42 is formed as an oval opening with a foldable flap 43 and is disposed centrally in the blank between the rows of cans. The other gripping recess 42 is disposed centrally in the edge of the blank and is formed as an open recess with a foldable flap 43. In a third embodiment of the invention (not shown in the drawings) the blank is adapted for two cans arranged in two rows, as in Figures 1 and 5. In this embodiment, there are two gripping recesses, both of which are centrally disposed in opposing edges of the blank and are formed as open recesses, similar to the gripping recesses 42 of Figure 5.

[0031] According to the invention, the blanks may effectively be assembled on the cans in an automated production line. The blanks may however also effectively be assembled in a semi-automated line or in a packaging line and it is also convenient to assemble the blank man-

ually into a package assembly.

[0032] It will be understood that the invention is not restricted to the aforedescribed exemplifying embodiments thereof and that several conceivable modifications of the invention are possible within the scope of the following claims.

Claims

1. A carrier of cardboard, preferably corrugated cardboard, for connecting a plurality of generally cylindrical cans (4), being disposed in at least two rows and having an inclined upper part and a top closure (6) with a projecting circular rim (8), said carrier (31) being produced from a plane blank (32), having, for each can to be connected by the carrier, two mutually opposing, essentially arcuate slits (44, 45), the outer edges of which engage below the rim (8) of the cans when the carrier is assembled on the plurality of cans to connect the carrier and the cans and form a package assembly,
characterised in that gripping recesses (42), adapted to be gripped by fingers to lift and handle the package assembly, are centrally disposed in the carrier blank (32) between the rows of cans (4), and that a bowl-shaped indentation (66) is formed centrally in the carrier (31) between said gripping recesses (42) and the rows of cans (4).

2. A carrier according to claim 1, **characterised in that** bowl-shaped indentations (68) are formed centrally in the carrier (31) between a gripping recess (42) and a side (58) of the carrier blank (32) and between the rows of cans (4).

3. A carrier according to claim 2, **characterised in that** said arcuate slits (44, 45) comprise an arcuate intermediate section (16; 46) and two arcuate end sections (18; 48) on each side thereof, said intermediate section (16; 46) being formed radially inside the extended arcuate end sections (18; 48).

4. A carrier according to claim 3, **characterised in that** said intermediate section (16; 46) forms an inwardly projecting arcuate engagement tongue (22; 52) between the end sections (18; 48), said tongue being adapted to abut on and engage below the rim (8) of the can to connect the carrier (1; 31) and the cans (4) in the assembled state of the carrier.

5. A carrier according to claim 4, **characterised in that** oblique folding lines (55) are disposed in the carrier blank (32) between the rows of cans (4), said oblique folding lines (55) connecting the outer portions of each engagement tongue (52) in the inner arcuate slits (45) with an adjacent gripping recess (42) or with an adjacent side (58) of the blank (32).

6. A carrier according to claim 5, **characterised in that** the arcuate end sections (18; 48) of the inner and outer slits (44, 45) are circular, having a radius which is equal to or slightly larger than the radius of the circular rim (8) of the can and that the inner arcuate slit (45) in each pair of opposing slits (44, 45) has an arcuate intermediate section (46) with a radius which is larger than the radius of the arcuate end sections (48).

7. A carrier according to claim 6, **characterised in that** the arcuate intermediate section (46) of said inner slit (45) forms a projecting engagement tongue (52, 52, 52), which is radially delimited by an arcuate folding line (53) extending between the end sections (48) of the slit (45) and which is divided by radially extending incisions (47) into at least two engagement flaps (52), said flaps (52) being adapted to be folded upwardly to bear on the inclined surface of the can (4) and to engage below the rim (8) of the can, when the carrier (31) is assembled on the cans (4).

8. A carrier according to claim 7, **characterised in that** the height of the engagement tongue of the inner slit (45) has its maximum in the centre of the tongue and decreases towards the ends of the tongue.

9. A carrier according to claim 8, **characterised in that** said oblique folding lines (55) extend between each outermost engagement flap (52) and an adjacent gripping recess (42) or an adjacent side (58) of the blank.

10. A carrier according to claim 9, **characterised in that** folding lines (54) are provided in the carrier blank (32) extending parallel with the sides (56) of the blank and with the rows of cans (4), said folding lines (54) connecting the ends of the arcuate slits (44, 45) with each other or with an adjacent side of the blank (32).

11. A carrier according to claim 10, **characterised in that** additional folding lines (54) are provided in the carrier blank (32) extending parallel with the sides (56) of the blank and with the rows of cans (4), said additional folding lines (54) connecting step-like portions (20), between the intermediate section (16) and the end sections (18) in the outer slits (44), with each other or with an adjacent side (58) of the blank, forming outer foldable side panels (60) along the rows of cans (4).

12. A carrier according to any one of the proceeding claims, **characterised in that** at least two gripping recesses (42) are provided between the rows of cans (4).

13. A carrier according to claim 12, **characterised in that** said gripping recesses (42) are formed as cir-

cular or oval openings in the carrier blank (32).

14. A plane blank of cardboard, preferably corrugated cardboard, said blank being adapted to be assembled as a carrier for a plurality of generally cylindrical cans being disposed in at least two rows, and having, for each can to be connected by the carrier, a pair of two mutually opposing, essentially arcuate slits (44, 45), **characterised in that** gripping recesses (42) are centrally disposed in the carrier blank (32) between the rows of said pairs of slits (44, 45), that said arcuate slits (44, 45) comprise an arcuate intermediate section (16; 45) and two arcuate end sections (18; 48) on each side thereof, said intermediate section (16; 46) being formed radially inside the extended arcuate end sections (18; 48).

15. A plane blank according to 14, **characterised in that** the arcuate intermediate section (46) of the inner slit (45) of each pair of slits (44, 45) forms a projecting engagement tongue (52, 52, 52) which is radially delimited by an arcuate folding line (53) extending between the end sections of the slit (45) and which is divided by radially extending incisions (47) into at least two engagement flaps (52).

16. A plane blank according to claim 15, **characterised in that** oblique folding lines (55) are disposed in the carrier blank (32) between the pairs of slits (44, 45), said oblique folding lines (55) connecting the outer portions of each engagement tongue (52) in the inner slits (45) with an adjacent gripping recess (42) or with an adjacent side (58) of the blank (32).

17. A plane blank according to claim 16, **characterised in that** folding lines (54) extending parallel with the sides (56) of the blank and with the rows of said pairs of slits (44, 45) are provided in the carrier blank (32), said folding lines connecting the ends of the arcuate slits (44, 45) with each other or with an adjacent side of the blank (32).

18. A plane blank according to claim 17, **characterised in that** additional folding lines (54) extending parallel with the sides (56) of the blank and with the rows of said pairs of slits (44, 45) are provided in the carrier blank (32), said additional folding lines (54) connecting step-like portions (20) between the intermediate section (16) and the end sections (18) in the outer slits (44) in each pair with each other or with an adjacent side (58) of the blank.

19. A method to assemble a plane blank (32) of cardboard, preferably corrugated cardboard, as a carrier (31) on a plurality of generally cylindrical cans (4) being disposed in at least two rows and having an inclined upper part and a top closure (6) with a projecting circular rim (8), said plane blank (32) comprising, for each can to be connected by the carrier, two mutually opposing, essentially arcuate slits (44, 45), the outer edges of which are intended to engage below the rim (8) of the cans when the carrier is assembled on the plurality of cans to connect the carrier and the cans and form a package assembly,
characterised in
that the plane blank (32) is superimposed on the plurality of cans (4),
that pressure is applied against two opposing side panels (60) on the blank (32), such that said panels are folded and the outer edges of the outer slits (44) are displaced downwardly to engage below the rim (8) of the cans (4), and
that pressure is applied against the central portion (62, 64) of the blank (32) between the rows of cans (4), such that the outer edges of the inner slits (45) are displaced downwardly to engage below the rim (8) of the cans (4) and such that a central portion (62) between the rows of cans (4) is forming a bowl-shaped indentation (66).

20. A method according to claim 19, **characterised in that** pressure is applied against the central portion (62, 64) of the blank (32) between the rows of cans (4), such that pressure is applied at certain central portions (62, 64) between each pair of cans (4) forming a bowl-shaped indentation (66, 68) between each pair of cans.

21. A method according to claim 20, **characterised in that** pressure is applied against the central portion (62, 64) of the blank (32) between the rows of cans (4) at certain central portions (62, 64), such that the blank (32) is folded in longitudinal folding lines (54) extending between the ends of the inner slits (45) or an adjacent side (48) of the blank and also in oblique folding lines (55) in the central portion of the blank.

22. A method according to claim 21, **characterised in that** pressure is applied against the central portion (62, 64) of the blank (32) between the rows of cans (4), such that pressure is applied at each central portion (62, 64) of the blank which is delimited by the oblique folding lines (55), gripping recesses (42) centrally disposed in the blank or a side (48) edge of the blank, and arcuate folding lines (53) radially delimiting an engagement tongue (52, 52; 52) formed in the inner slit (45).

23. A method according to claim 22, **characterised in that** pressure is applied against the central portion (62, 64) of the blank (32) between the rows of cans (4), such that the arcuate folding lines (53) are pressed against the inclined surface of the cans (4) and the engagement tongues (52, 52, 52) are being folded upwardly to engage below the rim (8) of the can.

24. A method according to claim 23, **characterised in that** the pressure that is applied against the central portion (62, 64) between the rows of cans (4) is applied by means of a pressure-applying tool with spring-loaded rolls.

Patentansprüche

1. Träger aus Karton, vorzugsweise aus Wellkarton, zum Verbinden einer Mehrzahl von im Wesentlichen zylindrischen Dosen (4), welche in wenigstens zwei Reihen angeordnet sind und einen geneigten oberen Teil und einen Deckelverschluss (6) mit einem überstehenden runden Rand (8) aufweisen, wobei der Träger (31) aus einem ebenen Zuschnitt (32) hergestellt wird, welcher für jede der Dosen, die mit dem Träger verbunden werden soll, zwei einander gegenüberliegende im Wesentlichen gekrümmte Schlitze (44, 45) aufweist, deren äußere Kanten unterhalb des Randes (8) der Dosen in Eingriff gelangen, wenn der Träger auf einer Mehrzahl von Dosen zum Verbinden der Dosen mit dem Träger und Ausbilden eines Verpackungszusammenbaus montiert wird,
dadurch gekennzeichnet, dass die Griffaussparungen (42), welche so ausgelegt sind, um durch Finger ergriffen zu werden, um den Verpackungszusammenbau anzuheben und zu handhaben, zentral auf dem Trägerzuschnitt (32) zwischen den Reihen von Dosen (4) angeordnet sind und dass eine wannenförmige Vertiefung (66) zentral auf dem Träger (31) zwischen den Griffaussparungen (42) und den Reihen der Dosen (4) ausgebildet ist.

2. Träger nach Anspruch 1, **dadurch gekennzeichnet, dass** wannenförmige Vertiefungen (68) zentral im Träger (31) zwischen einer Griffaussparung (42) und einer Seite (58) des Trägerzuschnitts (32) und zwischen den Reihen der Dosen (4) ausgebildet sind.

3. Träger nach Anspruch 2, **dadurch gekennzeichnet, dass** die gekrümmte Schlitze (44, 45) auf jeder Seite davon einen gekrümmten Mittelabschnitt (16; 46) und zwei gekrümmte Endabschnitte (18; 48) umfassen, wobei der Mittelabschnitt (16; 46) radial innerhalb der erweiterten gekrümmten Endabschnitte (18; 48) ausgebildet ist.

4. Träger nach Anspruch 3, **dadurch gekennzeichnet, dass** der Mittelabschnitt (16; 46) eine nach innen überstehende, gekrümmte Eingriffszunge (22; 52) zwischen den Endabschnitten (18 ; 48) ausbildet, wobei die Zunge so ausgelegt ist, um an den Rand (8) der Dose zu stoßen und unterhalb diesem einzugreifen, um den Träger (1; 31) und die Dosen (4) im montierten Zustand des Trägers zu verbinden.

5. Träger nach Anspruch 4, **dadurch gekennzeichnet, dass** schräg verlaufende Faltlinien (55) auf dem Trägerzuschnitt (32) zwischen den Reihen von Dosen (4) angeordnet sind, wobei die schräg verlaufenden Faltlinien (55) die äußeren Abschnitte jeder Eingriffszunge (52) in den inneren gekrümmten Schlitzen (45) mit einer benachbarten Griffaussparung (42) oder mit einer benachbarten Seite (58) des Zuschnitts (32) verbinden.

6. Träger nach Anspruch 5, **dadurch gekennzeichnet, dass** die gekrümmten Endabschnitte (18; 48) der inneren und äußeren Schlitze (44, 45) kreisförmig sind, wobei sie einen Radius aufweisen, welcher gleich oder etwas größer als der Radius des kreisförmigen Rands (8) der Dose ist, und dass der innere gekrümmte Schlitz (45) in jedem Paar gegenüberliegender Schlitze (44, 45) einen gekrümmten Mittelabschnitt (46) mit einem Radius aufweist, welcher größer ist als der Radius der gekrümmten Endabschnitte (48).

7. Träger nach Anspruch 6, **dadurch gekennzeichnet, dass** der gekrümmte Mittelabschnitt (46) des inneren Schlitzes (45) eine überstehende Eingriffszunge (52) ausbildet, welche radial durch eine gekrümmte Faltlinie (53), die sich zwischen den Endabschnitten (48) des Schlitzes (45) erstreckt, begrenzt ist und welche durch sich radial erstreckende Einschnitte (47) in wenigstens zwei Eingriffsklappen (52) geteilt ist, wobei die Klappen (52) so ausgelegt sind, um nach oben gefaltet zu werden, um auf die geneigte Oberfläche der Dose (4) zu wirken und unterhalb des Randes (8) der Dose einzugreifen, wenn der Träger (31) auf den Dosen (4) montiert wird.

8. Träger nach Anspruch 7, **dadurch gekennzeichnet, dass** die Höhe der Eingriffszunge des inneren Schlitzes (45) ihr Maximum in der Mitte der Zunge aufweist und in Richtung der Enden der Zunge abnimmt.

9. Träger nach Anspruch 8, **dadurch gekennzeichnet, dass** die schräg verlaufenden Faltlinien (55) sich zwischen jeder äußersten Eingriffsklappe (52) und einer benachbarten Griffaussparung (42) oder einer benachbarten Seite (58) des Zuschnitts erstrecken.

10. Träger nach Anspruch 9, **dadurch gekennzeichnet, dass** Faltlinien (54) auf dem Trägerzuschnitt (32) bereitgestellt sind, welche sich parallel mit den Seiten (56) des Zuschnitts und mit den Reihen von Dosen (4) erstrecken, wobei die Faltlinien (54) die Enden der gekrümmten Schlitze (44, 54) miteinander oder mit den benachbarten Seiten des Zuschnitts (32) verbinden.

11. Träger nach Anspruch 10, **dadurch gekennzeichnet, dass** zusätzliche Faltlinien (54) auf dem Trägerzuschnitt (32) bereitgestellt sind, welche sich parallel mit den Seiten (56) des Zuschnitts und mit den Reihen von Dosen (4) erstrecken, wobei die zusätzlichen Faltlinien (54) stufenartige Abschnitte (20) zwischen dem Mittelabschnitt (16) und den Endabschnitten (18) in den äußeren Schlitzen (44) miteinander oder mit einer benachbarten Seite (58) des Zuschnitts verbinden, wodurch sie äußere faltbare Seitenwände (60) entlang der Reihen von Dosen (4) ausbilden.

12. Träger nach jedem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** wenigstens zwei Griffaussparungen (42) zwischen den Reihen von Dosen (4) bereitgestellt sind.

13. Träger nach Anspruch 12, **dadurch gekennzeichnet, dass** die Griffaussparungen (42) als kreisförmige oder ovale Öffnungen im Trägerzuschnitt (32) ausgebildet sind.

14. Ebener Zuschnitt aus Karton, vorzugsweise aus Wellkarton, wobei der Zuschnitt so ausgelegt ist, um als ein Träger für eine Mehrzahl von im Wesentlichen zylindrischen Dosen, welche in wenigstens zwei Reihen angeordnet sind, montiert zu werden, und wobei er für jede der Dosen, die mit dem Träger verbunden werden soll, zwei einander gegenüberliegende, im Wesentlichen gekrümmte Schlitze (44, 45) aufweist, **dadurch gekennzeichnet, dass** die Griffaussparungen (42) zentral auf dem Trägerzuschnitt (32) zwischen den Reihen der Schlitzpaare (44, 45) angeordnet sind, dass die gekrümmten Schlitze (44, 45) einen gekrümmten Mittelabschnitt (16; 46) und zwei gekrümmte Endabschnitte (18; 48) auf jeder Seite davon umfassen, wobei der Mittelabschnitt (16; 46) radial innerhalb der erstreckten, gekrümmten Endabschnitte (18; 48) ausgebildet ist.

15. Ebener Zuschnitt nach Anspruch 14, **dadurch gekennzeichnet, dass** der gekrümmte Mittelabschnitt (46) des inneren Schlitzes (45) jedes Paars von Schlitzen (44, 45) eine überstehende Eingriffszunge (52) ausbildet, welche radial durch eine gekrümmte Faltlinie (53) begrenzt ist, die sich zwischen den Endabschnitten des Schlitzes (45) erstreckt und die durch sich radial erstrekkende Einschnitte (47) in wenigstens zwei Eingriffsklappen (52) geteilt ist.

16. Ebener Zuschnitt nach Anspruch 15, **dadurch gekennzeichnet, dass** schräg verlaufende Faltlinien (55) auf dem Trägerzuschnitt (32) zwischen den Paaren von Schlitzen (44, 45) angeordnet sind, wobei die schräg verlaufenden Faltl.inien (55) die äußeren Abschnitte jeder Eingriffszunge (52) in den inneren Schlitzen (45) mit einer benachbarten Griffaussparung (42) oder mit einer benachbarten Seite (58) des Zuschnitts (32) verbinden.

17. Ebener Zuschnitt nach Anspruch 16, **dadurch gekennzeichnet, dass** Faltlinien (54), welche sich parallel mit den Seiten (56) des Zuschnitts und mit den Reihen der Paare von Schlitzen (44, 45) erstrecken, auf dem Trägerzuschnitt (32) bereitgestellt sind, wobei die Faltlinien die Enden der gekrümmten Schlitze (44, 45) miteinander oder mit einer benachbarten Seite des Zuschnitts (32) verbinden.

18. Ebener Zuschnitt nach Anspruch 17, **dadurch gekennzeichnet, dass** zusätzliche Faltlinien (54), welche sich parallel mit den Seiten (56) des Zuschnitts und mit den Reihen der Paare von Schlitzen (44, 45) erstrecken, auf dem Trägerzuschnitt (32) bereitgestellt sind, wobei die zusätzlichen Faltlinien (54) stufenartige Abschnitte (20) zwischen dem Mittelabschnitt (16) und den Endabschnitten (18) in den äußeren Schlitzen (44) in jedem Paar miteinander oder mit einer benachbarten Seite (58) des Zuschnitts verbinden.

19. Verfahren zum Montieren eines ebenen Zuschnitts (32) aus Karton, vorzugsweise Wellkarton, als ein Träger (31) auf einer Mehrzahl von im Wesentlichen zylindrischen Dosen (4), welche in wenigstens zwei Reihen angeordnet sind und einen geneigten oberen Teil und einen Deckelverschluss (6) mit einem überstehenden runden Rand (8) aufweisen, wobei der ebene Zuschnitt (32) für jede der Dosen, die mit dem Träger verbunden werden soll, zwei einander gegenüberliegende im Wesentlichen gekrümmte Schlitze (44, 45) umfasst, deren äußere Kanten unterhalb des Randes (8) der Dosen in Eingriff gelangen sollen, wenn der Träger auf der Mehrzahl von Dosen zum Verbinden der Dosen mit dem Träger und Ausbilden eines Verpackungszusammenbaus montiert wird,
dadurch gekennzeichnet,
dass der ebene Zuschnitt (32) auf der Mehrzahl von Dosen (4) aufgelegt wird,
dass Druck gegen zwei gegenüberliegende Seitenwände (60) auf dem zuschnitt (32) ausgeübt wird, so dass die Wände gefaltet werden und die äußeren Kanten der äußeren Schlitze (44) nach unten versetzt werden, um unterhalb des Randes (8) der Dosen (4) einzugreifen, und
dass Druck gegen den zentralen Abschnitt (62, 64) des Zuschnitts (32) zwischen den Reihen von Dosen (4) ausgeübt wird, so dass die äußeren Kanten der inneren Schlitze (45) nach unten versetzt werden, um unterhalb des Randes (8) der Dosen (4) einzugreifen, und so dass ein zentraler Abschnitt (62) zwischen den Reihen von Dosen (4) eine wannenförmige Vertiefung (66) ausbildet.

20. Verfahren nach Anspruch 19, **dadurch gekennzeichnet, dass** Druck gegen den zentralen Abschnitt (62, 64) des Zuschnitts (32) zwischen den Reihen von Dosen (4) ausgeübt wird, so dass Druck auf bestimmte zentrale Abschnitte (62, 64) zwischen jedem Paar von Dosen (4) ausgeübt wird, wodurch eine wannenförmige Vertiefung (66, 68) zwischen jedem Paar von Dosen ausgebildet wird.

21. Verfahren nach Anspruch 20, **dadurch gekennzeichnet, dass** Druck gegen den zentralen Abschnitt (62, 64) des Zuschnitts (32) zwischen den Reihen von Dosen (4) an bestimmten zentralen Abschnitten (62, 64) ausgeübt wird, so dass der Zuschnitt (32) in Längsfaltlinien (54), die sich zwischen den Enden der inneren Schlitze (45) oder einer benachbarten Seite (48) des Zuschnitts erstrecken, oder auch in schräg verlaufenden Faltlinien (55) im zentralen Abschnitt des Zuschnitts gefaltet wird.

22. Verfahren nach Anspruch 21, **dadurch gekennzeichnet, dass** Druck gegen den zentralen Abschnitt (62, 64) des Zuschnitts (32) zwischen den Reihen von Dosen (4) an bestimmten zentralen Abschnitten (62, 64) ausgeübt wird, so dass Druck auf jeden zentralen Abschnitt (62, 64) des Zuschnitts, welcher durch die schräg verlaufenden Faltlinien (55), Griffaussparungen (42), die zentral auf dem Zuschnitt angeordnet sind, oder eine Seitenkante (48) des Zuschnitts begrenzt ist, und gekrümmten Faltlinien (53), die radial eine Eingriffszunge (52) begrenzen, welche im inneren Schlitz (45) ausgebildet ist, ausgeübt wird.

23. Verfahren nach Anspruch 22, **dadurch gekennzeichnet, dass** Druck gegen den zentralen Abschnitt (62, 64) des Zuschnitts (32) zwischen den Reihen von Dosen (4) ausgeübt wird, so dass die gekrümmten Faltlinien (53) gegen die schräge Oberfläche der Dosen (4) gedrückt werden und die Eingriffszungen (52, 52, 52) nach oben gefaltet werden, um unterhalb des Randes (8) der Dose einzugreifen.

24. Verfahren nach Anspruch 23, **dadurch gekennzeichnet, dass** der Druck, welcher gegen den zentralen Abschnitt (62, 64) zwischen den Reihen von Dosen (4) ausgeübt wird, mittels eines Druck aufbringenden Werkzeugs mit Feder belasteten Walzen aufgebracht wird.

Revendications

1. Support en carton, de préférence en carton ondulé, pour relier une pluralité de boîtes métalliques généralement cylindriques (4), étant disposées en au moins deux rangées et comportant une partie supérieure inclinée et une fermeture supérieure (6) avec une bordure circulaire en saillie (8), ledit support (31) étant produit à partir d'un flan plan (32), comportant, pour chaque boîte devant être reliée par le support, deux fentes sensiblement arquées, mutuellement opposées (44, 45), dont les bords externes s'engagent sous la bordure (8) des boîtes lorsque le support est assemblé sur la pluralité de boîtes pour relier le support et les boîtes et former un emballage, **caractérisé en ce que** des évidements de préhension (42), aptes à être saisis par les doigts pour soulever et manier l'emballage, sont disposés centralement dans le flan de support (32) entre les rangées de boîtes (4), et **en ce qu'**une empreinte en forme de cuvette (66) est formée centralement dans le support (31) entre lesdits évidements de préhension (42) et les rangées de boîtes (4).

2. Support selon la revendication 1, **caractérisé en ce que** des empreintes en forme de cuvette (68) sont formées centralement dans le support (31) entre un évidement de préhension (42) et un côté (58) du flan de support (32) et entre les rangées de boîtes (4).

3. Support selon la revendication 2, **caractérisé en ce que** lesdites fentes arquées (44, 45) comprennent une section intermédiaire arquée (16 ; 46) et deux sections d'extrémité arquées (18 ; 48) sur chaque côté, ladite section intermédiaire (16 ; 46) étant formée radialement à l'intérieur des sections d'extrémité arquées (18 ; 48) étendues.

4. Support selon la revendication 3, **caractérisé en ce que** ladite section intermédiaire (16 ; 46) forme une languette d'engagement arquée (22 ; 52) en saillie vers l'intérieur entre les sections d'extrémité (18 ; 48), ladite languette étant apte à buter sur, et s'engager sous, la bordure (8) de la boîte pour relier le support (1 ; 31) et les boîtes (4) à l'état assemblé du support.

5. Support selon la revendication 4, **caractérisé en ce que** des lignes de pliage obliques (55) sont disposées dans le flan de support (32) entre les rangées de boîtes (4), lesdites lignes de pliage obliques (55) reliant les portions externes de chaque languette d'engagement (52) dans les fentes arquées internes (45) avec un évidement de préhension (42) adjacent ou avec un côté adjacent (58) du flan (32).

6. Support selon la revendication 5, **caractérisé en ce que** les sections d'extrémité arquées (18 ; 48) des fentes externe et interne (44, 45) sont circulaires, ayant un rayon qui est égal, ou légèrement supérieur, au rayon de la bordure circulaire (8) de la boîte et **en ce que** la fente arquée interne (45) dans chaque paire de fentes opposées (44, 45) comporte une section intermédiaire arquée (46) ayant un rayon qui est supérieur au rayon des sections d'extrémité ar-

quées (48).

7. Support selon la revendication. 6, **caractérisé en ce que** la section intermédiaire arquée (46) de ladite fente interne (45) forme une languette d'engagement en saillie (52, 52, 52), qui est délimitée radialement par une ligne de pliage arquée (53) s'étendant entre les sections d'extrémité (48) de la fente (45) et qui est divisée par des incisions s'étendant radialement (47) en au moins deux volets d'engagement (52), lesdits volets (52) étant aptes à être pliés vers le haut pour porter sur la surface inclinée de la boîte (4) et s'engager sous la bordure (8) de la boîte, lorsque le support (31) est assemblé sur les boîtes (4)

8. Support selon la revendication 7 **caractérisé en ce que** la hauteur de la languette d'engagement de la fente interne (45) est maximale au centre de la languette et va en diminuant vers les extrémités de la languette.

9. Support selon la revendication 8, **caractérisé en ce que** lesdites lignes de pliage obliques (55) s'étendent entre chaque volet d'engagement le plus externe (52) et un évidement de préhension (42) adjacent ou un côté adjacent (58) du flan.

10. Support selon la revendication 9, **caractérisé en ce que** des lignes de pliage (54) sont prévues dans le flan de support (32) s'étendant parallèlement aux côtés (56) du flan et aux rangées de boîtes (4), lesdites lignes de pliage (54) reliant les extrémités des fentes arquées (44, 45) les unes avec les autres ou avec un côté adjacent du flan (32).

11. Support selon la revendication 10, **caractérisé en ce que** des lignes de pliage (54) supplémentaires sont prévues dans le flan de support (32), s'étendant parallèlement aux côtés (56) du flan et aux rangées de boîtes (4), lesdites lignes de pliage supplémentaires (54) reliant des portions à épaulement (20), entre la section intermédiaire (16) et les sections d'extrémité (18) dans les fentes externes (44), les unes avec les autres ou avec un côté adjacent (58) du flan, formant des panneaux latéraux pliables externes (60) le long des rangées de boîtes (4).

12. Support selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**au moins deux évidements de préhension (42) sont prévus entre les rangées de boîtes (4).

13. Support selon la revendication 12, **caractérisé en ce que** lesdits évidements de préhension (42) sont formés en des ouvertures circulaires ou ovales dans le flan de support (32).

14. Flan plan en carton, de préférence en carton ondulé, ledit flan étant apte à être assemblé en un support pour une pluralité de boîtes métalliques généralement cylindriques étant disposées en au moins deux rangées, et comportant, pour chaque boîte devant être reliée par le support, une paire de deux fentes sensiblement arquées, mutuellement opposées (44, 45), **caractérisé en ce que** des évidements de préhension (42) sont disposés centralement dans le flan de support (32) entre les rangées desdites paires de fentes (44, 45), **en ce que** lesdites fentes arquées (44, 45) comprennent une section intermédiaire arquée (16 ; 45) et deux sections d'extrémité arquées (18 ; 48) sur chaque côté, ladite section intermédiaire (16 ; 46) étant formée radialement à l'intérieur des sections d'extrémité arquées (18 ; 48) étendues.

15. Flan plan selon la revendication 14, **caractérisé en ce que** la section intermédiaire arquée (46) de la fente interne (45) de chaque paire de fentes (44, 45) forme une languette d'engagement en saillie (52, 52, 52), qui est délimitée radialement par une ligne de pliage arquée (53) s'étendant entre les sections d'extrémité de la fente (45) et qui est divisée par des incisions s'étendant radialement (47) en au moins deux volets d'engagement (52).

16. Flan plan selon la revendication 15, **caractérisé en ce que** des lignes de pliage obliques (55) sont disposées dans le flan de support (32) entre les paires de fentes (44, 45), lesdites lignes de pliage obliques (55) reliant les portions externes de chaque languette d'engagement (52) dans les fentes internes (45) avec un évidement de préhension (42) adjacent ou avec un côté adjacent (58) du flan (32).

17. Flan plan selon la revendication 16, **caractérisé en ce que** des lignes de pliage (54) s'étendant parallèlement aux côtés (56) du flan et aux rangées desdites paires de fentes (44, 45) sont prévues dans le flan de support (32), lesdites lignes de pliage reliant les extrémités des fentes arquées (44, 45) les unes avec les autres ou avec un côté adjacent du flan (32).

18. Flan plan selon la revendication 17, **caractérisé en ce que** des lignes de pliage (54) supplémentaires s'étendant parallèlement aux côtés (56) du flan et aux rangées desdites paires de fentes (44, 45) sont prévues dans le flan de support (32), lesdites lignes de pliage supplémentaires (54) reliant des portions à épaulement (20), entre la section intermédiaire (16) et les sections d'extrémité (18) dans les fentes externes (44), dans chaque paire les unes avec les autres ou avec un côté adjacent (58) du flan.

19. Procédé pour assembler un flan plan (32) en carton, de préférence en carton ondulé, en un support (31) sur une pluralité de boîtes métalliques généralement

cylindriques (4), étant disposées en au moins deux rangées et comportant une partie supérieure inclinée et une fermeture supérieure (6) avec une bordure circulaire en saillie (8), ledit flan plan (32) comprenant, pour chaque boîte devant être reliée par le support, deux fentes sensiblement arquées, mutuellement opposées (44, 45), dont les bords externes sont destinés à s'engager sous la bordure (8) des boites lorsque le support est assemblé sur la pluralité de boîtes pour relier le support et les boîtes et former un emballage,

caractérisé

en ce que le flan plan (32) est superposé à la pluralité de boîtes (4),

en ce qu'une pression est appliquée contre deux panneaux latéraux opposés (60) sur le flan (32), de manière que lesdits panneaux soient pliés et les bords externes des fentes externes (44) soient déplacés vers le bas pour s'engager sous la bordure (8) des boîtes (4), et

en ce qu'une pression est appliquée contre la portion centrale (62, 64) du flan (32) entre les rangées de boîtes (4), de manière que les bords externes des fentes internes (45) soient déplacés vers le bas pour s'engager sous la bordure (8) des boîtes (4) et de manière qu'une portion centrale (62) entre les rangées de boîtes (4) forme une empreinte en forme de cuvette (66).

20. Procédé selon la revendication 19, **caractérisé en ce qu'**une pression est appliquée contre la portion centrale (62, 64) du flan (32) entre les rangées de boîtes (4), de manière que la pression soit appliquée au niveau de certaines portions centrales (62, 64) entre deux boîtes d'une paire (4), formant une empreinte en forme de cuvette (66, 68) entre deux boîtes d'une paire.

21. Procédé selon la revendication 20, **caractérisé en ce qu'**une pression est appliquée contre la portion centrale (62, 64) du flan (32) entre les rangées de boîtes (4) au niveau de certaines portions centrales (62, 64), de manière que le flan (32) soit plié dans les lignes de pliage longitudinales (54) s'étendant entre les extrémités des fentes internes (45) ou un côté adjacent (48) du flan et également dans les lignes de pliage obliques (55) dans la portion centrale du flan.

22. Procédé selon la revendication 21, **caractérisé en ce qu'**une pression est appliquée contre la portion centrale (62, 64) du flan (32) entre les rangées de boîtes (4), de manière qu'une pression soit appliquée au niveau de chaque portion centrale (62, 64) du flan qui est délimitée par les lignes de pliage obliques (55), les évidements de préhension (42) disposés centralement dans le flan ou un bord latéral (48) du flan, et les lignes de pliage arquées (53) délimitant radialement une languette d'engagement (52, 52, 52) formée dans la fente interne (45). 0

23. Procédé selon la revendication 22, **caractérisé en ce qu'**une pression est appliquée contre la portion centrale (62, 64) du flan (32) entre les rangées de boîtes (4), de manière que les lignes de pliage arquées (53) soient pressées contre la surface inclinée des boîtes (4) et les languettes d'engagement (52, 52, 52) soient pliées vers le haut pour s'engager sous la bordure (8) de la boîte.

24. Procédé selon la revendication 23, **caractérisé en ce que** la pression qui est appliquée contre la portion centrale (62, 64) entre les rangées de boîtes (4) est appliquée au moyen d'un outil d'application de pression à rouleaux chargés par ressorts.

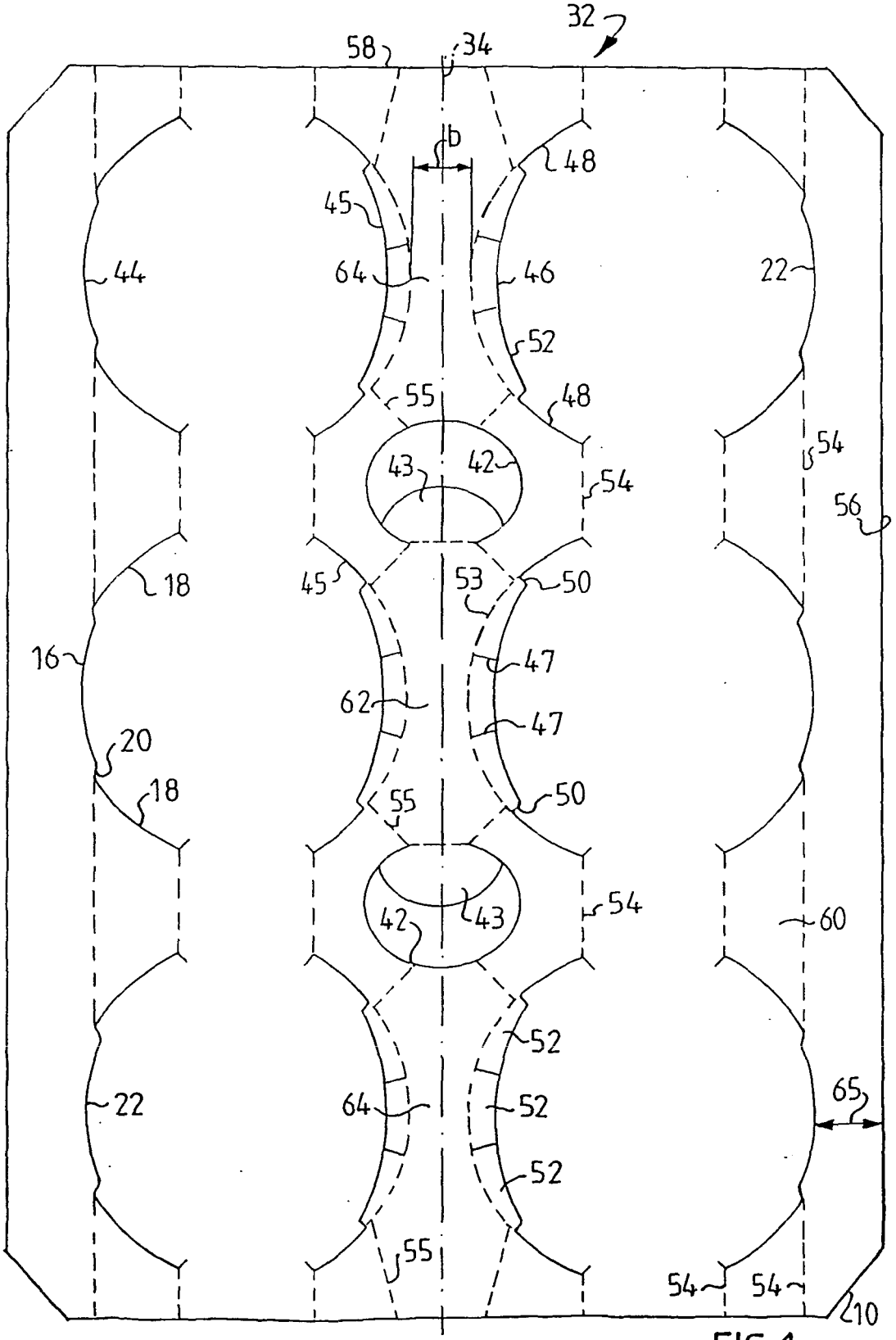

32
58
34
b
48
45
44
64
46
22
52
55
48
54
43
42
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18
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16
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62
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22
64
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65
52
55
54
54
10

FIG. 1

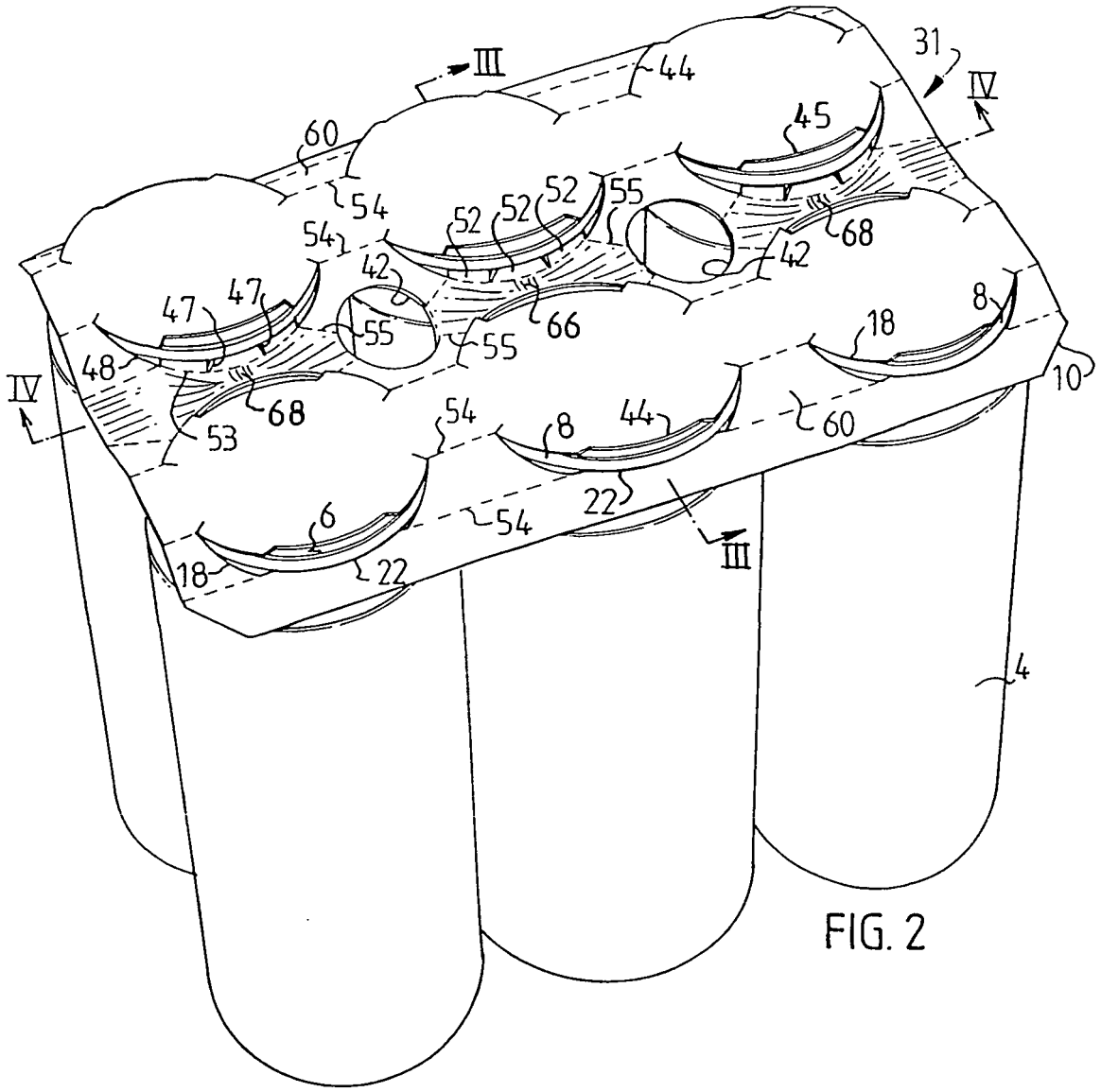

III
44
31
IV
60
45
54
52
52
52
55
54
42
68
42
47
47
55
55
66
18
8
48
IV
68
53
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44
60
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6
54
22
III
18
22
4

FIG. 2

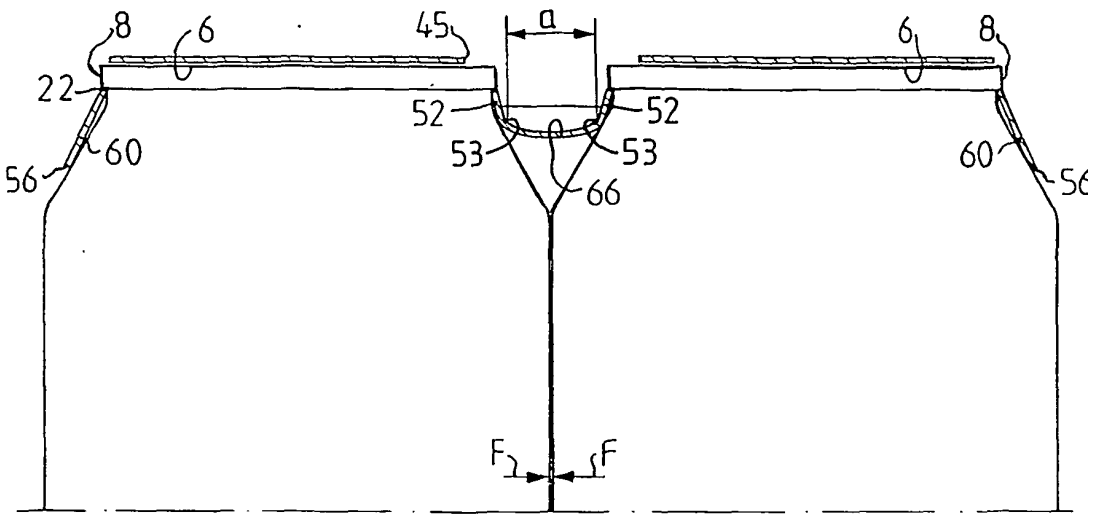

8
6
45
a
6
8
22
52
52
53
53
60
60
56
66
F
F

FIG. 3

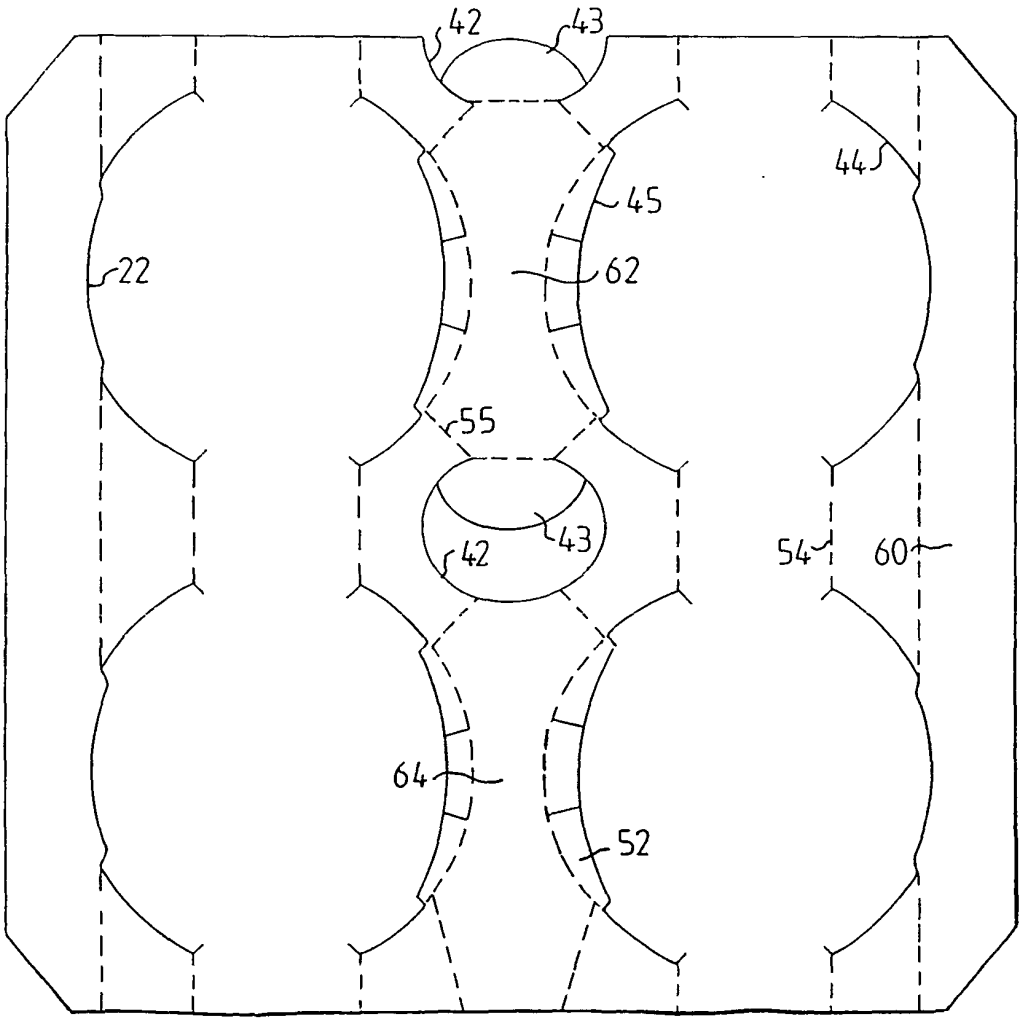

42
43
44
45
22
62
55
43
42
54
60
64
52

FIG. 5

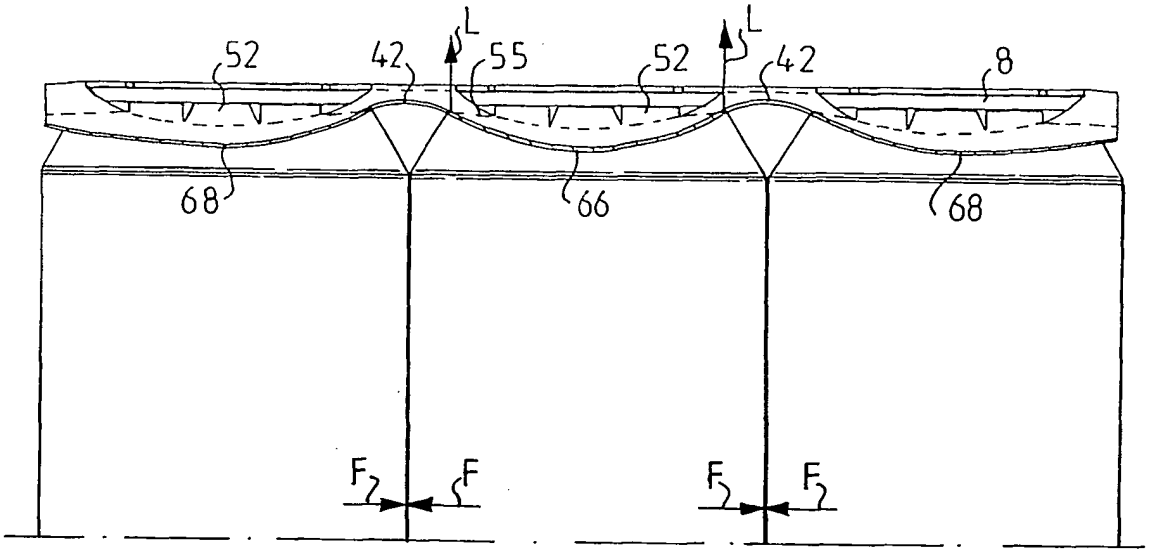


FIG. 4