



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
01.07.2009 Bulletin 2009/27

(51) Int Cl.:
B65D 17/34 (2006.01)

(21) Application number: **07025095.6**

(22) Date of filing: **24.12.2007**

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

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(54) **Can, panel for a can and a method for making such a panel for a can**

(57) The invention relates to a can (1), comprising a body (2) provided with a panel (4) and a tab (5) connected to the panel, which tab has a front tab part (7) and a rear tab part (6) for by gripping and tilting forming with the tab

front part an opening in the panel along a panel score line (13), wherein the tab is in a tilted position due to a deformation of the tab-panel connection, to a panel and to a method of making the panel and/or can.

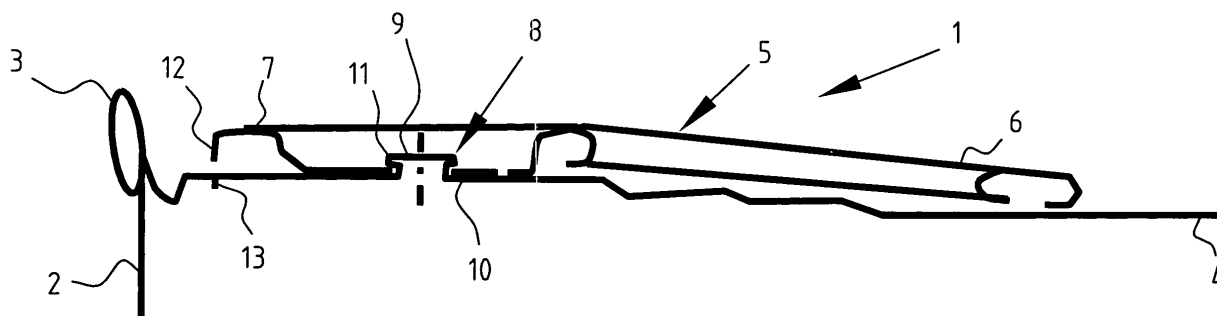
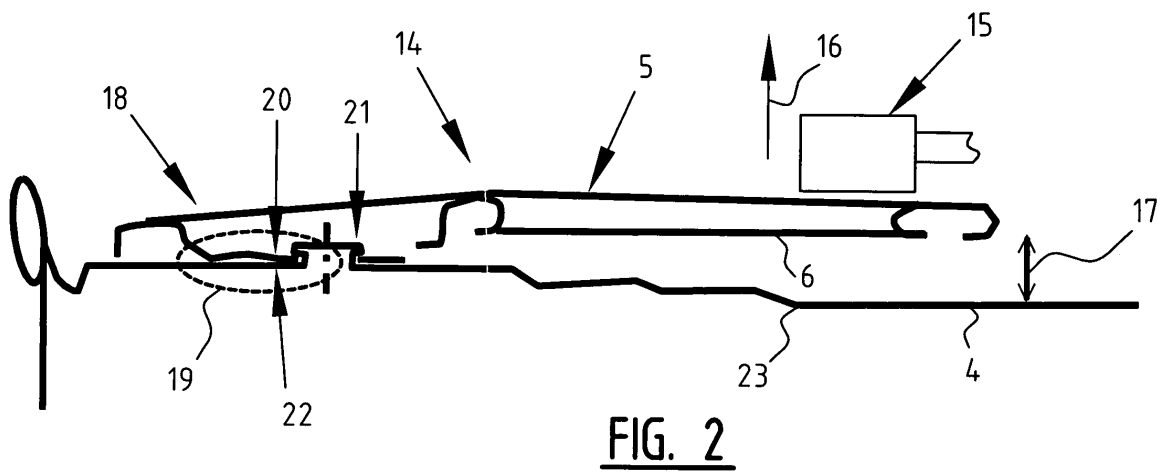


FIG. 1



Description

[0001] The present invention relates to a can, to a panel for a can and to a method for making such panel or can.

[0002] The can according to the invention may be of the type of a so called easy opening closure. An easy opening closure is a metal closure for a can in which an opening may be formed by using one or more fingers and without the requirement of a separate opening tool. To that extent the can is provided with a tab for forming an opening in the panel of the can. The tab functions as a lever. The tab comprises a tab rear part for gripping by the consumer with one or more fingers. The tab is actuated by levering the tab whereby the tab front part contacts the panel. The panel is provided with an opening defined by a score line which is formed in the panel surface. After popping the score line with the tilted tab front part the opening in the panel is formed along the score line. If intended, the central part of the panel circumvented by the score line may be torn off using the tab. Accordingly, an easy opening can is a can in which an opening may be formed without the need of using a separate opening tool.

[0003] Such can may be filled and subsequently closed by seaming or soldering the easy opening panel onto the can. Thereafter the filled easy opening can may be subjected to heating or cooling and further handling for packaging and transport. This requires that the tab, in particular the tab rear part remains within the confinement of the can (in particular within the can seaming edge) such that interference by a projecting tab part is substantially avoided. This requirement counters the requirement for easy access of the tab rear part for gripping with one or more fingers by the consumer.

[0004] Accordingly, there is a continuous need for providing an easy opening panel for a can which combines optimal conditions for the supplier of the panel and can and, for the consumer.

[0005] The present invention has for its object to provide a can and a panel for such a can which provides an optimal finger access underneath the rear tab part, and/or allow a lower force to lift the rear tab part and form the opening in the can.

[0006] Accordingly the present invention provides a can, comprising a body provided with a panel and a tab connected to the panel, which tab has a front tab part and a rear tab part for by gripping and tilting forming with the tab front part an opening in the panel along a panel score line, wherein the tab is in a tilted position due to a deformation of the tab-panel connection

[0007] The present invention is based on the insight that a part of the opening procedure may be carried out by the producer of the panel or the supplier of the can prior to making the can available to the consumer. The starting part of the opening procedure goes through an elastic deformation and subsequent plastic deformation of the tab-panel connection up to the popping of the score line whereafter the initial opening and access to the con-

tainer occurs. It is in this starting part of the opening procedure up to just before popping which is to be carried out prior to making the can available to the consumer. Obviously, the start of the opening procedure is to be carried out to such extent that the tab in the tilted position will not interfere with the production and filling of the can and the transport to the consumer. Furthermore, due to carrying out the tilting of the tab to the desired extent, the tab-panel connection will deform first elastically and subsequently plastically. This will result in a required lower force to be applied by the consumer for popping the opening and/or the tab remains in the tilted position due to the applied elastic and subsequently plastic (permanent) deformation of the tab-panel connection.

[0008] According to one embodiment occurs the deformation in only the tab part of the tab-panel connection. In an other embodiment occurs the deformation in only the panel part of the tab-panel connection. In both these embodiments is the tab directly connected to the panel by seaming, soldering or glueing.

[0009] In the alternative is a tab connected to the panel via a structural connecting element and occurs at least partly the deformation in this structural connecting element. This structural connecting element could be an integral part of the panel or could be a separate structural element such as a rivet. Obviously, in all these embodiments it is also possible that the deformation not only occurs in the tab part, in the panel part or in the structural connecting element, but occurs in the assembly of the tab and panel or tab, structural connecting element and panel, which form the tab-panel connection or assembly.

[0010] In order to avoid any interference with the general or standard production and filling operations it is preferred that the rear tab part resides within the can confinement.

[0011] The finger access of the tab rear part with the tab in the tilted position, may be further improved when the rear tab part resides above a depressed panel part.

[0012] As indicated above the start of the opening procedure goes through an elastic and subsequent plastic deformation of a tab-panel connection. Plastic deformation is substantially permanent. However, elastic and plastic deformation may occur at the same time in different parts of the tab-panel connection. In order to have a secured tilted position of the tab, it is preferred that the deformation of the tab-panel connection comprises at least partially plastic deformation.

[0013] A subsequent aspect of the invention relates to a method of making a panel according to the invention. This method comprises steps of connection a tab to a panel, and subsequently tilting the tab thereby deforming the tab-panel connection such that the tab remains in the tilted position. According to one embodiment is the tilting step carried out by hooking (such as with a hook) by levering (such as by using a lever) and/or by helix spinning (using a spinning helix). In all these embodiments an additional mechanical element is gripping beneath the rear tab part for the subsequent carrying out of the tilting

operation.

[0014] In another embodiment is the tilting step carried out by glue pulling or magnetic pulling. Both these types of pullings occur with a mechanical element which is not gripping beneath the tab but makes contact with the upper surface of at least the rear tab part. In glue pulling the mechanical element temporarily contacts and pulls due to a glue action on the tab. Preferred is magnetic pulling such as by using an electro-magnet using magnetic force.

[0015] Finally the present invention relates to a panel or can obtainable with method according to the invention.

[0016] Mentioned and other features and characteristics of the panel, can and method for making will be further illustrated by making reference to an embodiment which is different for illustrative purposes only and not intended to limit the present invention to any extend.

[0017] In this respect reference will be made to the annexed figures in which:

Figures 1 and 2 are cross sectional views of the two steps in making a can provided with a panel according to the invention which was brought into the tilted position.

[0018] Figure 1 shows a can 1. The can 1 comprises a body 2 to which is connected via a seam 3 an easy opening panel 4. The panel 4 comprises a tab 5 having a rear tab part 6 and a front tab part 7.

[0019] The tab 5 is connected to the panel 4 via a structural connecting element 8. This element 8 is integral with the panel 4 and has the form of a rivet. The rivet 9 is inserted in an opening 10 and is locked into the opening by a widened upper section 11.

[0020] The front tab part 7 is provided with a nose 12 which could operate with a score line 13 formed into the panel 4. By tilting the tab 5 after gripping the rear tab part the nose will contact in the area near the score line and after applying sufficient force will ultimately pop open the panels 4 along the score line 13.

[0021] The can 1 shown in figure 1 may be considered an intermediate can to be used in the method according to the invention for producing a panel and can according to the invention.

[0022] Figure 2 shows the can 14 according to the invention with the tab 5 brought into the illustrated and shown tilted position.

[0023] According to the preferred production method, an electro magnet 15 was brought into contact with the rear tab part 6 and under magnetic force the tab 5 was lifted according to the arrow 16 thereby generating a finger access 17 between panel 4 and rear tab part 6.

[0024] The tab 5 remains in this shown tilted position due to a deformation 18 in the tab panel connection 19 systematically indicated by the oval area. The tilting may have resulted in a deformation of the tab part 20, and or the rivet part 21 and or panel part 22 all forming part of the tab-panel connection. The deformation in the tab 5,

in the rivet 9 and or panel 4 may be elastic and/or plastic. Preferably and ideally is the deformation at least partially plastic because it is a permanent deformation and then the tab is secured in the tilted position.

[0025] Finally it is noted that the step according to the invention for bringing the tab in the tilted position may be carried out with a modified or additional tooling used in a current apparatus used in the production of easy opening panels and cans. Such apparatus comprises an easy opening conversion press, a labeller machine for filled cans and thelike. Obviously, a stand alone machine may be used and inserted in any possible area of the production line of easy opening panels and cans.

[0026] Finally, as shown in figure 2 is the finger access optimal and even maximal if beneath the rear tab part 6 lies a depressed panel part 23.

Claims

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1. Can, comprising a body provided with a panel and a tab connected to the panel, which tab has a front tab part and a rear tab part for by gripping and tilting forming with the tab front part an opening in the panel along a panel score line, wherein the tab is in a tilted position due to a deformation of the tab-panel connection.

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2. Can according to claim 1, wherein the deformation is in the tab part of the tab-panel connection

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3. Can according to claim 1 or 2, wherein the deformation is in the panel part of the tab-panel connection.

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4. Can according to claim 1-3, wherein the tab is connected to the panel via a structural connecting element, and the deformation is in the structural connecting element.

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5. Can according to claim 1-4, wherein the structural connecting element is an integral part of the panel.

6. Can according to claim 1-4, wherein the structural connecting element is a separate structural connecting element, such as a rivet.

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7. Can according to claim 1-6, wherein the tab rear part resides within the can confinement.

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8. Can according to claim 1-7, wherein the tab rear part resides above a depressed panel part.

9. Can according to claim 1-8, wherein the deformation comprises at least partially plastic deformation.

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10. Panel for a can, as defined in claim 1-9.

11. Method for making a panel according to claim 10, or

a can according to claim 1-9, comprising the steps of:

- i) connecting a tab to the panel; and
- ii) tilting the tab thereby deforming the tab-panel connection such that the tab remains in the tilted position. 5

12. Method according to claim 11, wherein the tilting step ii) is carried out by hooking, levering and/or helix spinning. 10

13. Method according to claim 11 or 12, wherein the tilting step ii) is carried out by glue pulling or magnetic pulling. 15

14. Panel or can obtainable by the method according to claims 11-13.

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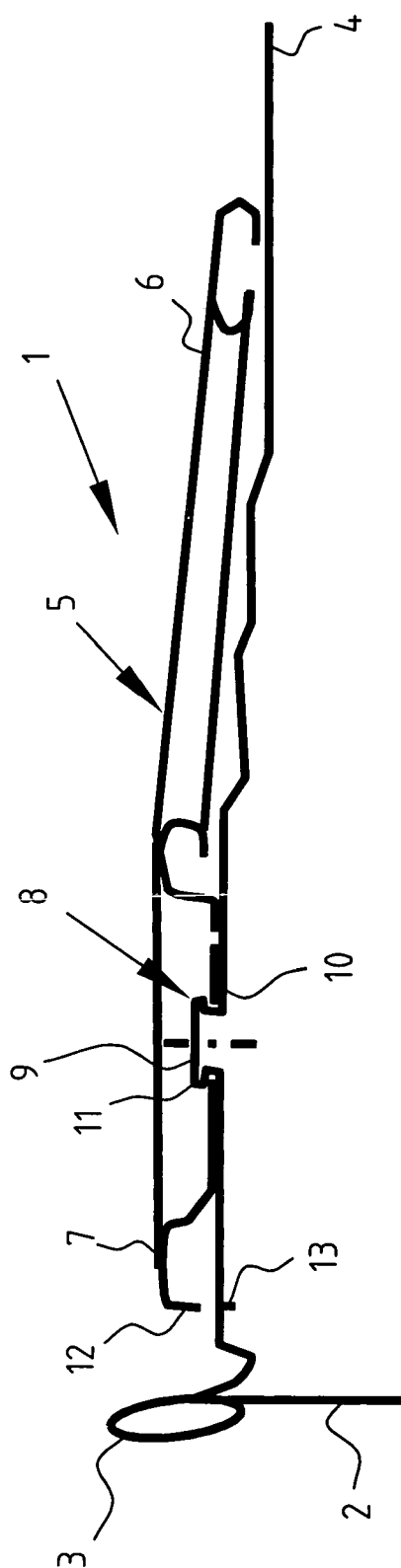


FIG. 1

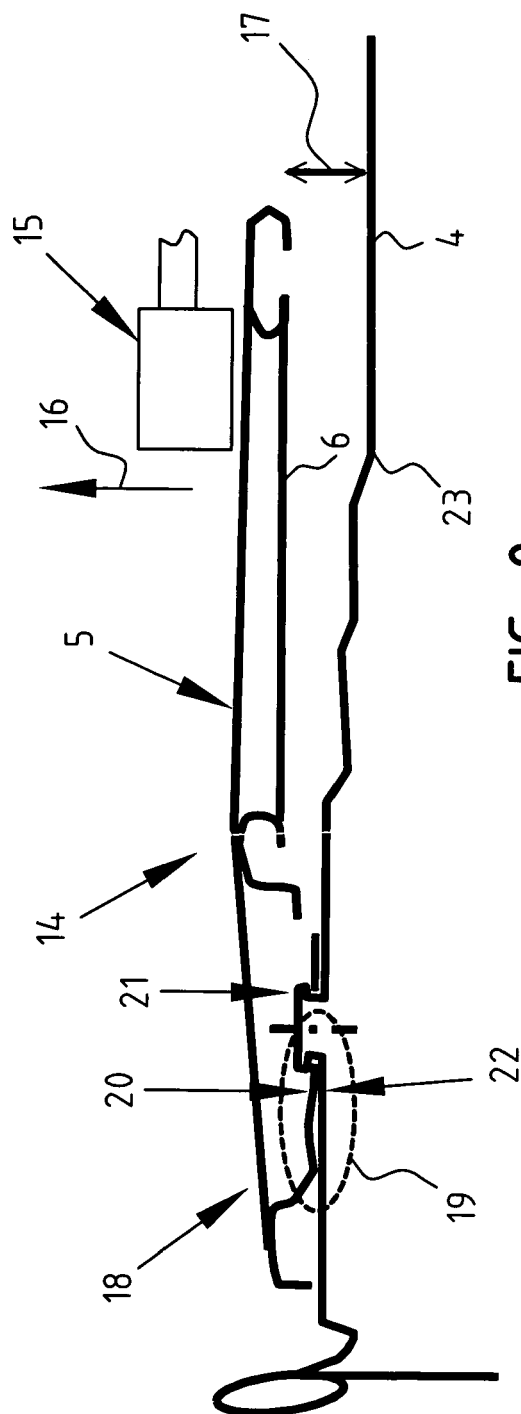


FIG. 2



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 07 02 5095

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 655 678 A (KOBAYASHI TADAO [JP]) 12 August 1997 (1997-08-12) * page 1, column 1, line 5 - column 2, line 35 * * page 2, column 3, line 51 - column 4, line 43; figures 2,7a,8,9 *	1,2, 6-12,14	INV. B65D17/34
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 12 June 2008	Examiner Mans-Kamerbeek, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82