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

(11) EP 1 330 400 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
23.06.2004 Bulletin 2004/26

(21) Application number: **01974054.7**

(22) Date of filing: **28.09.2001**

(51) Int Cl.[7]: **B65D 88/14**, B65D 90/08

(86) International application number:
PCT/DK2001/000620

(87) International publication number:
WO 2002/026594 (04.04.2002 Gazette 2002/12)

(54) **A FREIGHT CONTAINER**

FRACHTCONTAINER

CONTENEUR DE TRANSPORT

(84) Designated Contracting States:
DE NL

(30) Priority: **29.09.2000 DK 200001443**

(43) Date of publication of application:
30.07.2003 Bulletin 2003/31

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(56) References cited:
US-A- 4 212 406
US-A- 4 429 730
US-A- 5 109 998

EP 1 330 400 B1

Printed by Jouve, 75001 PARIS (FR)

Description

[0001] The present invention relates to a freight container having sides oriented perpendicularly to each other and defining an internal cargo space, and having an access opening allowing access to said cargo space, said access opening being surrounded by substantially straight sections of a channel-shaped first groove, said sections being oriented perpendicularly to each other, said groove extending in a plane which is substantially parallel with the access opening, wherein said freight container has separate groove connection devices with a second groove having a cross-sectional shape corresponding essentially to the first-mentioned groove and which forms a continuously extending, smooth transition between said sections of the first groove.

[0002] Such a container is already known, wherein straight sections of a groove are formed on the internal surface of the horizontal and vertical elements in a frame that encloses an access opening at the end of the container. The groove connection devices are secured by welding to the frame and thereby enable attachment of a film across the access opening, the edges of the sheet being inserted into the groove for subsequent fixing by means of a flexible plastics strip that is pressed into the groove. By means of the groove connection devices it is possible, in a simple manner, to ensure a tight connection between the film and the groove at the inner corners of the container where the straight sections of the groove meet. Because of the smooth transition, the plastics strip, which has a shape adapted to the cross-section of the first groove, may thus be received in a continuously extending, annular groove that has a uniform cross-section, without being given sharp bends.

[0003] However, this prior art solution presupposes that the groove connection devices are made of a weldable material.

[0004] For long it has been a wish to manufacture the groove connection devices in an inexpensive manner, preferably such that the groove connection device can be replaced without further ado. In accordance with the invention this problem is solved in a particularly simple manner by the groove connection devices comprising engagement means that are shaped complementarily with the first groove and adapted for providing a mechanical engagement with two adjoining sections of the first groove. The groove connection device can made of eg a plastics material.

[0005] It is particularly preferred that the groove connection devices have a groove that forms a curved transition between the straight sections.

[0006] According to a particularly advantageous embodiment of the invention, the groove connection devices comprise a first part adapted to be engaged with the first groove and a second part adapted to prevent subsequent removal of the first part from the first groove, and locking means for allowing releasable retention of the second part relative to the first groove.

[0007] The groove connection device being in releasable engagement with the first groove on two adjoining sides enables replacement of damaged groove connection devices.

[0008] In those cases where the groove is formed with an approximately symmetrical cross-section for the sake of the attachment of the strip, the groove connection devices may advantageously be formed as featured in claim 7.

[0009] Further, advantageous embodiments of the invention are defined in the dependent claims.

[0010] The invention will now be explained more fully below with reference to the embodiment shown in the drawing.

Fig. 1, seen from the access opening, shows part of a freight container which is sealed by a sheet that extends across the access opening,

Fig. 2 shows a horizontal cross-sectional view through the left vertical frame of the freight container in fig. 1, in the area at the access opening,

Fig. 3 shows a detailed view of the joint between two frame elements that are incorporated in the freight container shown in fig. 1,

Fig. 4 shows a partially exploded view of the corner joint shown in fig. 3, and

Fig. 5 shows a vertical cross-section through the joint shown in fig. 3.

[0011] In fig. 1, the reference numeral 1 shows the end of an elongated freight container that is, in the embodiment shown, preferably provided with a cooling device (not shown) for establishing a desired temperature interiorly of the freight container. The freight container 1 has sides in the form of parallel and vertical walls 20, a horizontal bottom, a horizontal ceiling 10 and an end wall (not shown). In the example, the freight container 1 has two annular vertical frames 30, 40 at the shown end that combine to define an access opening to the freight container 1. This access opening may be closed by means of doors 5 that are secured to the outer frame 30 of the two frames by means of hinges 31, the other frame 40 of the two frames being arranged internally in the first-mentioned frame 30.

[0012] The doors 5, together with the sides 10, 20 and the end wall, are preferably provided with a suitable insulation for maintaining the desired temperature in the interior of the freight container. Furthermore, the freight container 1 is provided with a flexible plastics sheet 7 that extends across the access opening and that greatly seals the atmosphere in the freight container 1 from the outside when the doors 5 are closed, in a conventional manner.

[0013] Fig. 2 shows an enlarged view of a horizontal

cross-section through the one vertical wall 20 of the freight container 1, more particularly the wall that is not visible in fig. 1. It appears that the wall 20 has an outer cladding 22 and an inner cladding that has a surface 24 directed towards the interior of the freight container 1. An insulating material 26, preferably a foamed material, is arranged between the outer cladding 22 and the inner cladding. A vertically extending element 32 of the frame 30 is connected with the outer cladding 22 via a weld 21, and the inner cladding is connected via a weld 25 to a vertical frame element 41 that is incorporated in the frame 40. It will be appreciated that the figure merely represents a preferred embodiment where the two frames 30, 40 are movably interconnected by a gasket 33, as is described in European Patent No. 731 768 which is hereby incorporated in the present text by way of reference.

[0014] Fig. 2 moreover shows that the surfaces facing inwards towards the interior of the container 1 are formed with an elongated channel-shaped first groove 43 that is defined outwardly by two locking flanges 45, 46. The locking flanges 45, 46 define a longitudinal access passage to the groove 43 that, as shown, expands immediately behind the locking flanges 45, 46, and preferably converge again in a direction towards the bottom of the groove 43. As shown, the groove 43 may be formed integrally with the frame element 41 in the internal frame 40 and preferably extends uninterruptedly around the entire access opening. Alternatively, the groove 43 may be formed in the inner cladding at a desired distance from the access opening, or the groove 43 may be formed in the frame 30, e.g. if an internal frame 40 is not used. Further, if desired, the groove may be formed such that the access passage is oriented in a direction toward the access opening.

[0015] As shown, the groove 43 serves to fix the edge 7' of the above-mentioned sheet 7 in the access opening in a conventional manner, there being used a flexible strip 8 of a plastics material for this purpose which is pressed into the groove 43 after insertion of the edge 7' in the groove 43. The shape of the groove 43 behind the locking flanges 45, 46 may be selected to facilitate this pressing-in. The strip 8 preferably has a length corresponding to the perimeter of the access opening, and the strip 8 may be pulled out to release the sheet 7 when access to the interior of the freight container 1 is desired.

[0016] Fig. 3 shows an inner corner of the frame 40, where the vertical frame element 41 shown in fig. 2 is connected, e.g. by welding, to a corresponding horizontal frame element 41' which is intended to be connected with the bottom of the freight container 1. It will be seen that the two frame elements 41 and 41' are interconnected via a groove connection device 50, which may be adapted to impart a certain rigidity to the joint of the frame elements 41, 41'. More particularly, the groove connection device 50 is secured to the groove 43 in a releasable manner, and at the top the groove connection device 50 has a curved groove 51 which is shaped so as to form a continuous transition between the groove 43 extending on the vertical frame element 41 and the groove 43 extending on the horizontal frame element 41'. More particularly, the second groove 51 has essentially the same profile as the groove 43, and the groove connection device 50 may thus receive the sheet 7 and the strip 8 at the shown joint. It appears that, according to the shape of the groove 43, the locking flanges 45, 46 in the frame elements 41, 41' may also be provided with recesses 49 which, to a greater extent, allow unobstructed insertion of the strip 8 at the transition between the groove 43 in the frame elements 41, 41' and the groove 51 of the groove connection device 50. Because of the curved expanse of the groove 51 it is ensured that the strip 8 is not given a sharp bend.

[0017] In fig. 4, the groove connection device 50 is shown in greater detail, and it appears that the groove connection device 50 is composed of three separate parts, viz. a first part 52, a second part 65 and a third part 60. Each of these parts has a through hole 53, 66 and 61, respectively, and the three parts may be interconnected by means of a transverse pin (not shown) that may be passed through the holes 53, 61 and 66 when the parts are arranged side by side as shown in fig. 3. Each of the parts 52, 65 and 60 has a curved side edge, and these curved side edges together form the curved upper groove 51 of the groove connection device 50. The first part 52 and the third part 60 are provided with hook-like projections 54, 62, by means of which these parts may be caused to engage the groove 43, and with locking flanges 45', 46' of a shape corresponding to the shape of the locking flanges 45, 46 of the groove 43. The hook-like projections 54, 62, which will be seen more clearly in fig. 5, are arranged along each of the two edge sides of the parts 52, 60 that extend along the vertical frame element 41 and the horizontal frame element 41', respectively. The first part 52 and the second part 60 may moreover be provided with incisions that serve the same purpose as the recesses 49.

[0018] In fig. 5, the groove connection device 50 is shown in the mounted state, where the groove connection device 50 is kept engaged with the groove 43 on the horizontal frame element 41' as well as the vertical frame element 41. It will be seen here how the locking hooks 62, 54 on the first part and the third part, respectively, of the groove connection device 50 are engaged with the locking flanges 45, 46 that define the horizontal and the vertical groove 43 outwardly.

[0019] The mounting of the grove connection device in the groove 43 is more particularly carried out in that the first part 52 is inserted into the groove via the access passage between the locking flanges 45, 46 and are moved laterally, such that the locking hook 54 of the part engages the rear side of the locking flange 45 of the groove 43, both in the vertical frame element 41 and in the horizontal frame element 41'. The third part 60 is inserted into the groove 43 in a corresponding manner. Then, the second part 65 of the groove connection de-

vice 50 is inserted into the space between the first part 52 and the third part 60. The second part 65 is preferably formed with a width corresponding to the space. In this position, the first part 52 and the third part 60 are prevented from being moved laterally backwards. The second part 65 is finally fixed by means of the above-mentioned transverse pin, which is inserted through the holes 53, 61, 66 and is secured, e.g. by means of a nut. It should be stressed that the second part 65 may very well be fixed in another manner, e.g. by snapping on.

[0020] Although, as explained above, the invention primarily serves to provide a groove for retaining the mounting strip 8 at the inner corners of the freight container 1, it is clear that the groove connection device 50 may also be used for imparting increased strength to the frame 40 at the corners, and that, in this case, the groove 43 may merely be necessary in the area at the corners of the freight container 1. The groove 43 in the frame elements 41, 41' may also be provided with stops that prevent relative displacement of the locking device 50 relative to the frame elements. It is hereby possible to connect the frame elements 41, 41' solely because of the engagement between the locking hooks 54 and the locking flanges 45, 46.

Claims

1. A freight container (1) having sides (10, 20) oriented perpendicularly to each other and defining an internal cargo space, and having a rectangular access opening which allows access to said cargo space, said access opening being surrounded by straight sections of a channel-shaped first groove (43), said sections being oriented perpendicularly to each other, said first groove (43) extending in a plane which is substantially parallel with the plane of the access opening, said freight container (1) having separate groove connection devices (50) with a second groove (51) that has a cross-sectional shape corresponding to the first groove (43), and which forms a continuously extending smooth transition between two adjoining sections of the first groove (43), **characterised in that** the groove connection devices (50) comprise engagement means that are shaped complementarily to the first groove (43) and adapted to provide a mechanical engagement with two adjoining sections of the first groove (43).

2. A freight container according to the preceding claim, **characterised in that** the first groove (43) is formed integrally with the sides (10,20).

3. A freight container according to any of the preceding claims, **characterised in that** the second groove (51) forms a curved transition between said sections of the first groove (43).

4. A freight container according to any one of the preceding claims, **characterised in that**, in cross-section, the first groove (43) is defined outwardly by a locking flange (45) that defines an access passage to the first groove (43); and
that the groove connection device (50) comprises:

   a first part (52) adapted to be moved into the first groove (43) through said access passage and laterally forwards to a locking position in which the first part (52) is in engagement with the locking flange (45),

   a second part (65) which, in said locking position, is adapted to prevent removal of the first part (52) through the access passage, and

   locking means to allow a preferably releasable retention of the second part (65) relative to the first groove in said locking position.

5. A freight container according to claim 4, **characterised in that** the second part (65) is adapted to engage the first part (52) and a surface of the first groove (43), respectively, in said locking position.

6. A freight container according to claim 4 or 5, **characterised in that** the locking means are shaped as an elongated pin that extends through the first part (52) and the second part (65).

7. A freight container according to any one of preceding claims 4-6, **characterised in that** the first groove (43) has an additional locking flange (46), said access passage to the first groove (43) extending between the first-mentioned locking flange (45) and the additional locking flange (46); and that the groove connection device (50) comprises a third part (60) adapted to be moved into the first groove (43) through said access passage and laterally forwards to a locking position in which the third part (60) is engaged with a locking flange (46); and
that said second part (65) is adapted to prevent removal of both the first part (52) and the third part (60) through the access passage in said locking position.

8. A freight container according to the preceding claim, **characterised in that** the first part (52) and the third part (60) comprise protruding locking hooks (54, 62) adapted to engage the locking flanges (45, 46) in said locking position; and
that the second part (60) is adapted to retain the first part (52) and the third part (60) at a fixed mutual distance in said locking position.

9. A freight container according to any one of preceding claims 4-8, **characterised in that** the first

groove (43) is arranged near the access opening.

10. A freight container according to any one of preceding claims 4-8, wherein the access opening is surrounded by a separate frame (40) connected with at least one of said sides (10, 20), **characterised in that** the frame (40) carries the first groove (43).

11. A freight container according to the preceding claim, **characterised in that** the groove (43) is formed integrally with the frame (40) by extrusion.

12. A freight container according to any one of the preceding claims, **characterised in that** the groove connection device (50) is dimensioned to impart a substantial rigidity to the freight container (1) at the connection between the sides (10, 20).

Patentansprüche

1. Frachtcontainer (1) mit rechtwinklig zueinander orientierten und einen inneren Frachtraum definierenden, und eine rechteckige, Zugang zu dem Frachtraum gestattende Zugangsöffnung aufweisende Seiten (10, 20), wobei die Zugangsöffnung durch gerade Abschnitte einer kanalförmigen ersten Nut (43) umgeben ist, und die Abschnitte rechtwinklig zueinander orientiert sind, und die erste Nut (43) sich in einer Ebene erstreckt, die im Wesentlichen parallel mit der Ebene der Zugangsöffnung ist, und der Frachtcontainer (1) getrennte Nutverbindungsvorrichtungen (50) mit einer zweiten Nut (51) aufweist, die eine der ersten Nut (43) entsprechende Querschnittsform aufweist, und die einen sich kontinuierlich erstreckenden, gleichmäßigen Übergang zwischen zwei angrenzenden Abschnitten der ersten Nut (43) ausbildet, **dadurch gekennzeichnet, dass** die Nutverbindungsvorrichtungen (50) eine Eingriffseinrichtung umfassen, die ergänzend zu der ersten Nut (43) ausgebildet und angepasst ist, ein mechanisches Eingreifen mit zwei angrenzenden Abschnitten der ersten Nut (43) bereit zu stellen.

2. Frachtcontainer gemäß dem vorangehenden Anspruch, **dadurch gekennzeichnet, dass** die erste Nut (43) einstückig mit den Seiten (10, 20) ausgebildet ist.

3. Frachtcontainer gemäß jedem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die zweite Nut (51) einen gekrümmten Übergang zwischen den Abschnitten der ersten Nut (43) ausbildet.

4. Frachtcontainer gemäß jedem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die erste Nut (43) im Querschnitt nach außen durch einen Sperrflansch (45) definiert ist, der einen Zugangsdurchtritt zu der ersten Nut (43) definiert; und dass die Nutverbindungsvorrichtung (50) umfasst:

ein erstes Teil (52), das angepasst ist durch den Zugangsdurchtritt in die erste Nut (43) und seitlich nach vorwärts zu einer Sperrposition bewegt zu werden, in der das erste Teil (52) sich in Eingriff mit dem Sperrflansch (45) befindet,
ein zweites Teil (65), das in der Sperrposition angepasst ist, ein Entfernen des ersten Teils (52) durch den Zugangsdurchtritt zu verhindern, und
einer Sperreinrichtung, um eine bevorzugt lösbare Beibehaltung des zweiten Teils (65) relativ zu der ersten Nut in der Sperrposition zu erlauben.

5. Frachtcontainer gemäß Anspruch 4, **dadurch gekennzeichnet, dass** das zweite Teil (65) angepasst ist, in der Sperrposition mit dem ersten Teil (52) bzw. einer Oberfläche der ersten Nut (43) in Eingriff zu sein.

6. Frachtcontainer gemäß Anspruch 4 oder 5, **dadurch gekennzeichnet, dass** die Sperreinrichtung als verlängerter Bolzen ausgebildet ist, der sich durch das erste Teil (52) und das zweite Teil (65) erstreckt.

7. Frachtcontainer gemäß jedem der vorangehenden Ansprüche 4 bis 6, **dadurch gekennzeichnet, dass** die erste Nut (43) einen zusätzlichen Sperrflansch (46) aufweist, wobei sich der Zugangsdurchtritt zu der ersten Nut (43) zwischen dem zuerst erwähnten Sperrflansch (45) und dem zusätzlichen Sperrflansch (46) erstreckt; und
dass die Nutverbindungsvorrichtung (50) ein drittes Teil (60) umfasst, das angepasst ist, durch den Zugangsdurchtritt in die erste Nut (43) und seitlich nach vorwärts zu einer Sperrposition bewegt zu werden, in der das dritte Teil (60) mit einem Sperrflansch (46) in Eingriff ist; und
dass das zweite Teil (65) angepasst ist, ein Entfernen von sowohl dem ersten Teil (52) als auch dem dritten Teil (60) durch den Zugangsdurchtritt in die Sperrposition zu verhindern.

8. Frachtcontainer gemäß dem vorangehenden Anspruch, **dadurch gekennzeichnet, dass** das erste Teil (52) und das dritte Teil (60) vorspringende Sperrhaken (54, 62) umfassen, die angepasst sind, mit den Sperrflanschen (45, 46) in der Sperrposition in Eingriff zu sein; und
dass das zweite Teil (65) angepasst ist, das erste Teil (52) und das dritte Teil (60) in einem fixierten beiderseitigen Abstand in der Sperrposition zurück-

zuhalten.

9. Frachtcontainer gemäß jedem der vorangehenden Ansprüche 4 bis 8, **dadurch gekennzeichnet, dass** die erste Nut (43) in der Nähe der Zugangsöffnung angeordnet ist.

10. Frachtcontainer gemäß jedem der vorangehenden Ansprüche 4 bis 8, wobei die Zugangsöffnung von einem separaten Rahmen (40) umgeben ist, der mit zumindest einer der Seiten (10, 20) verbunden ist, **dadurch gekennzeichnet, dass** der Rahmen (40) die erste Nut (43) trägt.

11. Frachtcontainer gemäß dem vorangehenden Anspruch, **dadurch gekennzeichnet, dass** die Nut (43) einstückig mit dem Rahmen (40) durch Extrusion ausgebildet ist.

12. Frachtcontainer gemäß jedem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Nutverbindungsvorrichtung (50) dimensioniert ist, dem Frachtcontainer (1) bei der Verbindung zwischen den Seiten (10, 20) eine wesentliche Steifigkeit zu übermitteln.

Revendications

1. Conteneur de transport (1) muni de côtés (10, 20) orientés à la perpendiculaire l'un par rapport à l'autre et définissant un espace interne de cargaison et possédant une ouverture rectangulaire d'accès permettant l'accès audit espace de cargaison, ladite ouverture d'accès étant entourée par des sections droites d'une première rainure en forme de canal (43), lesdites sections étant orientées perpendiculairement l'une par rapport à l'autre, ladite première rainure (43) s'étendant dans un plan sensiblement parallèle aux plans de l'ouverture d'accès, ledit conteneur de transport (1) possédant des dispositifs séparés de connexion à rainure (50) muni d'une seconde rainure (51) présentant une forme de section transversale correspondant à la première rainure (43) et formant une transition régulière en extension continue entre les deux sections attenantes de la première rainure (43), **caractérisé en ce que** les dispositifs de connexion à rainure (50) comprennent des moyens d'engagement qui sont conformés de façon complémentaire à la première rainure (43) et sont prévus pour constituer un engagement mécanique avec deux sections attenantes de la première rainure (43).

2. Conteneur de transport selon la revendication précédente, **caractérisé en ce que** la première rainure (43) est formée de façon intégrale aux côtés (10, 20).

3. Conteneur de transport selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la seconde rainure (51) forme une transition incurvée entre lesdites sections de la première rainure (43).

4. Conteneur de transport selon l'une quelconque des revendications précédentes, **caractérisé en ce que**, en section transversale, la première rainure (43) est définie vers l'extérieur par un rebord de blocage (45) définissant un passage d'accès à la première rainure (43) ; et

en ce que le dispositif de connexion à rainure (50) comprend :

- une première partie (52) prévue pour être déplacée à l'intérieur de la première rainure (43) via ledit passage d'accès et latéralement vers l'avant sur une position de blocage dans laquelle la première partie (52) est en engagement avec le rebord de blocage (45) ;
- une seconde partie (65) qui, dans ladite position de blocage, est prévue pour empêcher un enlèvement de la première partie (52) par l'intermédiaire du passage d'accès ; et
- un moyen de blocage pour permettre une rétention de préférence amovible de la seconde partie (65) par rapport à la première rainure dans ladite position de blocage.

5. Conteneur de transport selon la revendication 4, **caractérisé en ce que** la seconde partie (65) est prévue pour engager respectivement la première partie (52) et une surface de la première rainure (43) dans ladite position de blocage.

6. Conteneur de transport selon la revendication 4 ou 5, **caractérisé en ce que** les moyens de blocage sont conformés selon une broche allongée s'étendant à travers la première partie (52) et la seconde partie (65).

7. Conteneur de transport selon l'une quelconque des revendications 4 à 6, **caractérisé en ce que** la première rainure (43) possède un rebord additionnel de blocage (46), ledit passage d'accès à la première rainure (43) s'étendant entre le rebord de blocage mentionné en premier (45) et le rebord de blocage additionnel (46) ; et

en ce que le dispositif de connexion à rainure (50) comprend une troisième partie (60) prévue pour être déplacée à l'intérieur de la première rainure (43) via ledit passage d'accès et latéralement vers l'avant sur une position de blocage dans laquelle la troisième partie (60) est engagée par un rebord de blocage (46) ; et

en ce que ladite seconde partie (65) est prévue pour empêcher un enlèvement, à la fois, de la

première partie (52) et de la troisième partie (60) par l'intermédiaire du passage d'accès dans ladite position de blocage.

8. Conteneur de transport selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la première partie (52) et la troisième partie (60) comprennent des crochets de blocage en protubérance (54, 62) prévus pour engager les rebords de blocage (45, 46) dans ladite position de blocage, et **en ce que** la seconde partie (60) est prévue pour retenir la première partie (52) et la troisième partie (60) à une distance mutuelle fixée dans ladite position de blocage.

9. Conteneur de transport selon l'une quelconque des revendications 4 à 8, **caractérisé en ce que** la première rainure (43) est disposée près de l'ouverture d'accès.

10. Conteneur de transport selon l'une quelconque des revendications 4 à 8, dans lequel l'ouverture d'accès est entourée par un cadre séparé (40) raccordé à au moins un desdits côtés (10, 20), **caractérisé en ce que** le cadre (40) porte la première rainure (43).

11. Conteneur de transport selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la rainure (43) est formée de façon intégrale au cadre (40) par extrusion.

12. Conteneur de transport selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le dispositif de connexion à rainure (50) est dimensionné pour conférer une rigidité substantielle au conteneur de transport (1) sur la connexion entre les côtés (10, 20).

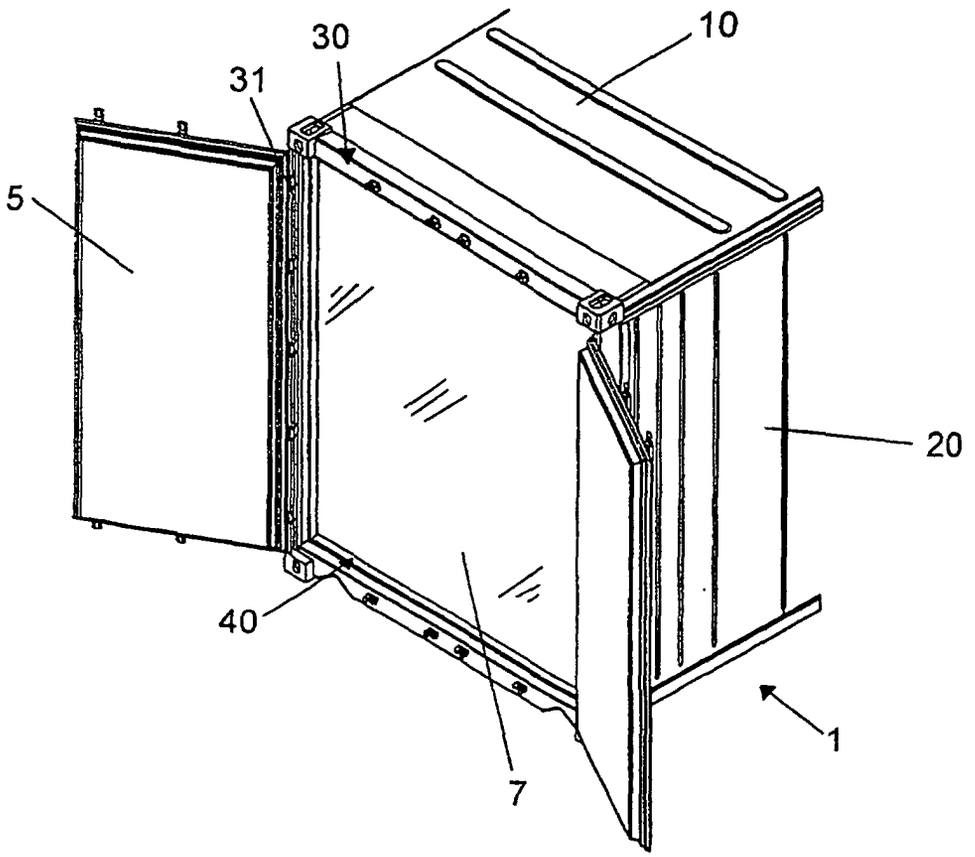

Fig. 1

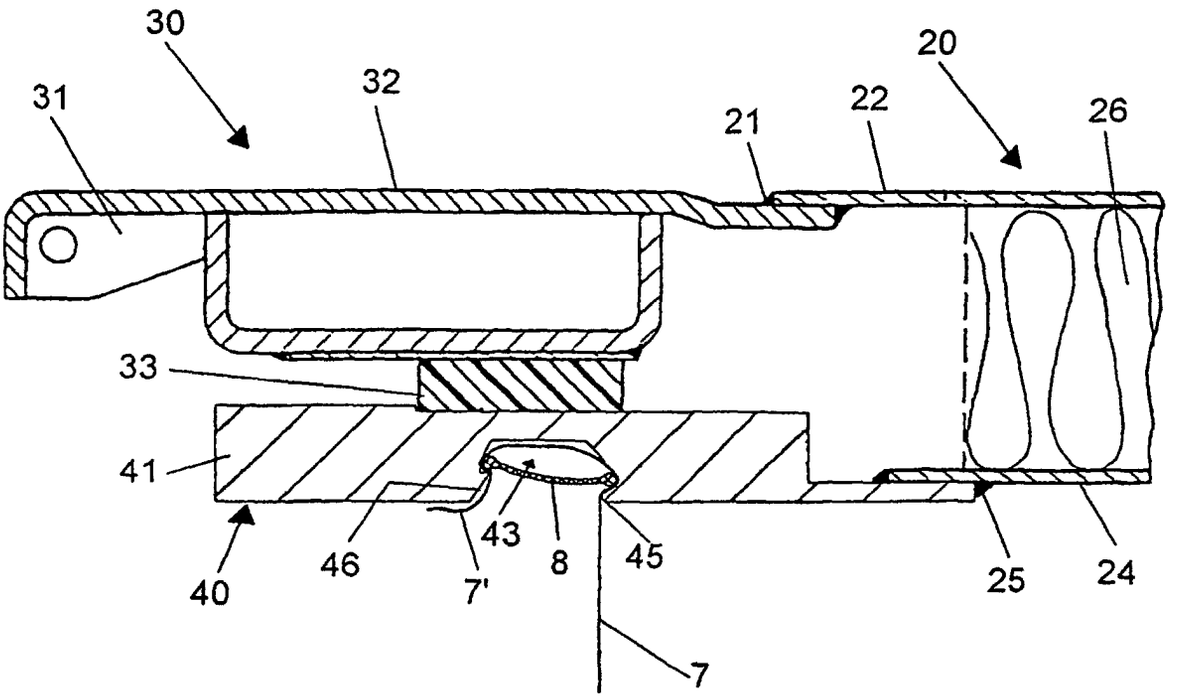

Fig. 2

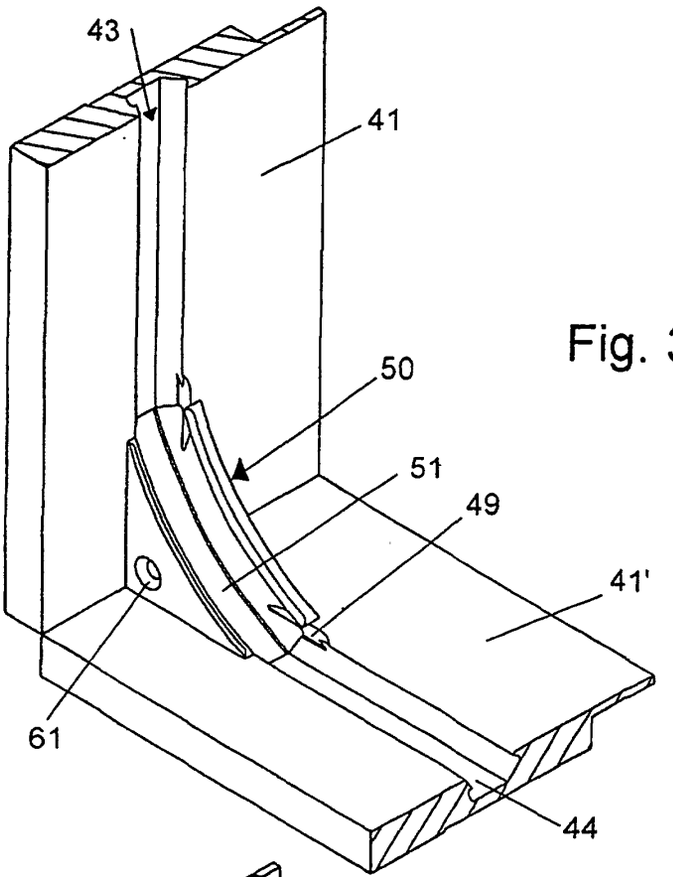
43
41
50
51
49
41'
61
44

Fig. 3

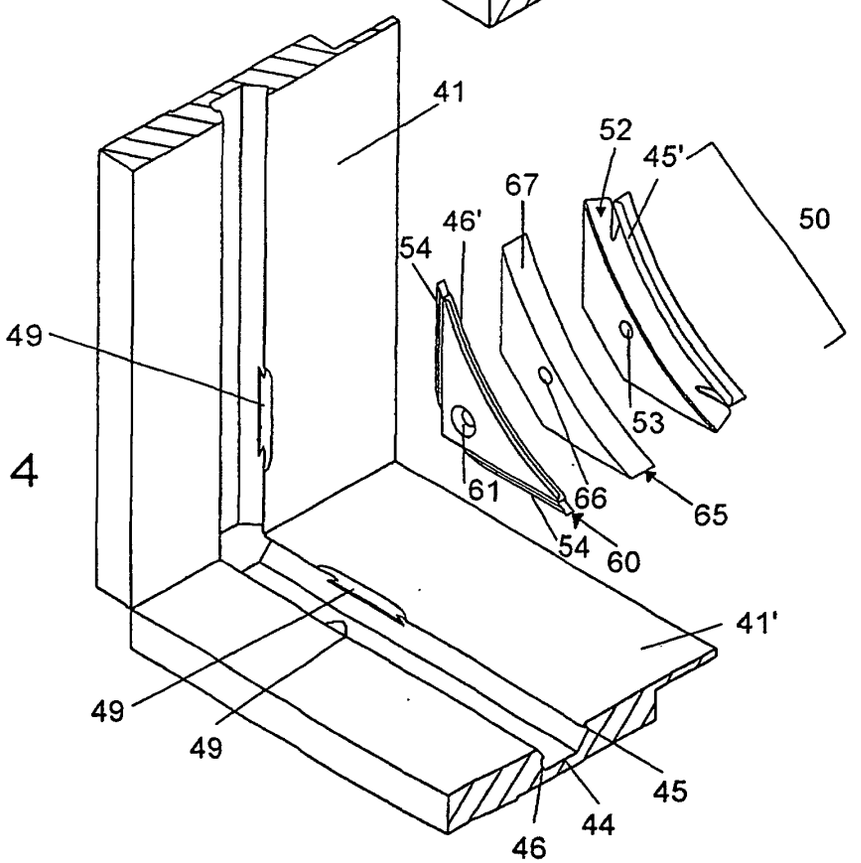
41
52
45'
67
50
46'
54
49
53
61
66
65
54
60
41'
49
49
45
44
46

Fig. 4

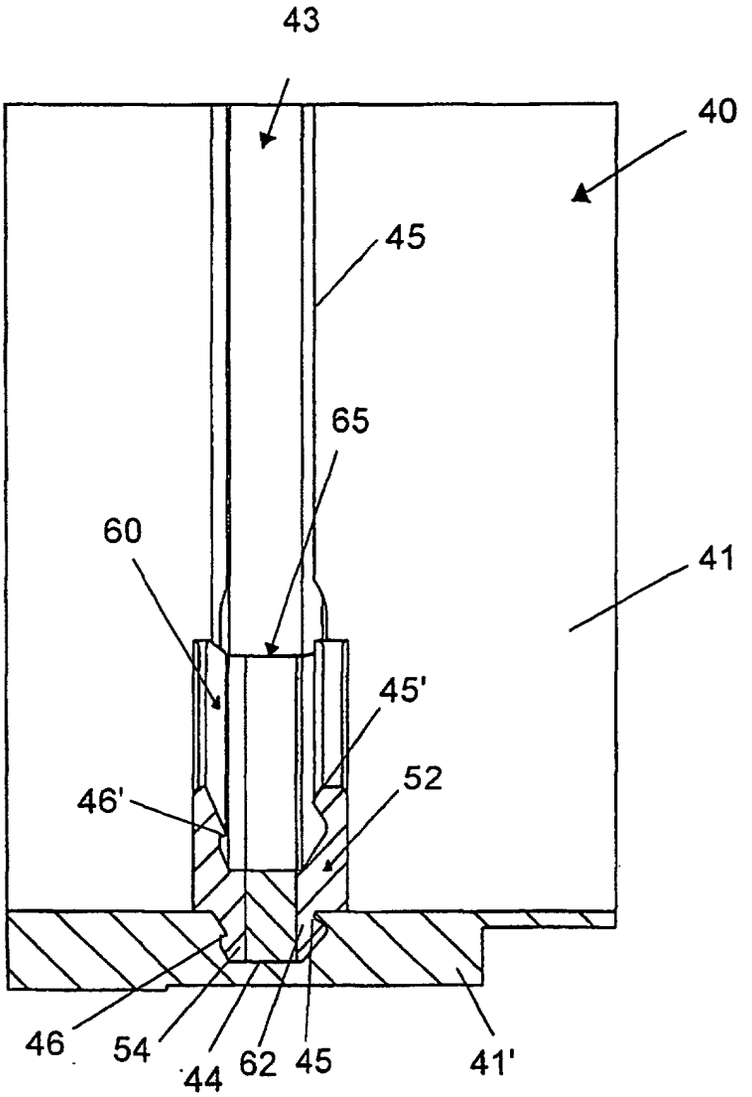

Fig. 5