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

(11) Publication number: **0 411 005 B1**

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **28.12.94**

(51) Int. Cl.[5]: **E04B 1/348**, B65D 88/12

(21) Application number: **89904831.8**

(22) Date of filing: **14.04.89**

(86) International application number:
**PCT/GB89/00392**

(87) International publication number:
**WO 89/09859 (19.10.89 89/25)**

(54) **CONTAINER.**

(30) Priority: **14.04.88 GB 8808827**
**23.09.88 GB 8822416**

(43) Date of publication of application:
**06.02.91 Bulletin 91/06**

(45) Publication of the grant of the patent:
**28.12.94 Bulletin 94/52**

(84) Designated Contracting States:
**AT BE CH DE FR GB IT LI LU NL SE**

(56) References cited:
**DE-A- 2 624 928**
**DE-U- 8 415 639**
**FR-A- 2 249 257**
**GB-A- 2 164 974**

(73) Proprietor: **GNJATOVIC, Ljubomir**
**5 Kingsley Avenue**
**London W13 0EO (GB)**

(72) Inventor: **GNJATOVIC, Ljubomir**
**5 Kingsley Avenue**
**London W13 0EO (GB)**

(74) Representative: **Shaw, Laurence**
**5th Floor,**
**Metropolitan House,**
**1 Hagley Road,**
**Edgbaston**
**Birmingham B16 8TG (GB)**



EP 0 411 005 B1

## Description

The invention relates to a transportable container, especially one which is built of lightweight but strong frame members. One use of a container of the invention is as an ISO Standard refrigerated or dry container of the type carried on ships, aeroplanes, lorry trailers or rail wagons and the like.

It is one object of the invention to provide a container with a high degree of thermal insulation: it is another object to provide a container of relatively lightweight; and yet another object is to provide one which has high corrosion resistance.

FR-A-2249257 discloses a transportable container comprising a frame formed of elongate frame members having a cladding secured thereto wherein at least one of the frame members includes a thermal break along at least a portion of its length.

In one aspect there is provided a transportable container comprising a frame formed from frame members joined together and having a cladding secured thereto, at least one of the frame members including a thermal break along at least a portion of its length, characterised in that at least one of the frame members comprises two lengths of metal which are joined together along a common edge by a bridging member formed from a thermally insulating material to define the thermal break between the two lengths.

Elongate reinforcing elements formed from, e.g. lengths of steel or stainless steel tubing may be mounted adjacent the frame members to strengthen the frame. Preferably, the frame members are of generally box-cross section and the reinforcing elements are mounted within the hollow interior of the frame member. In an especially preferred embodiment the frame members are of box cross-section and three such members are joined together at least at one corner of the frame by a connector having three orthogonal projections which engage the facing end of the respective frame members, the projections having pegs which are received within the facing end portion of the tubular reinforcing element.

DE-A-2624928 discloses a container having corner connectors faces of which have projecting arms arranged to be received in the end portions of hollow box section frame members.

Preferably the frame members are hollow, and refrigeration apparatus mounted on the container is adapted to pass temperature controlled gas through at least one of the hollow frame members from the apparatus through vent means.

The interior of the container may be provided with a flat floor, and still have adequate circulation of cooling air, in contrast to known structures where supplementary ducting is required on the floor, e.g. a corrugated floors. This gives an increase in useful interior space and saves weight. In this way a dry container may be provided which is of light weight, but which is also strong.

In order that the invention may be better understood, it will now be described with reference to the accompanying diagrammatic drawings, in which:

| | |
|---|---|
| Figure 1 | is a perspective view of the frame less the cladding; |
| Figure 2 | is an elevation of one container end wall housing refrigeration apparatus; |
| Figure 3 | is an elevation of the container end wall having the doors in an open condition; |
| Figure 4 | is the same as Figure 3, with the doors in a closed condition; |
| Figure 5 | is a sectional view along line A-A of Figure 4; |
| Figure 6 | is a sectional view along line B-B on Figure 4; |
| Figures 7-13 | show cross-sections of different section lengths |
| Figure 14 | is a perspective view of a corner connector; and |
| Figure 15 | is a cross-sectional view of a corner connection. |

As best shown in Figures 1 to 6 a transportable container 1 is made from a cladding comprising e.g a sandwich of steel, aluminium or stainless steel sheeting 2 with a filler 3 of insulating material, which is applied to a rectangular box-like frame 4 made from elongate structural members 5 joined together. The outer sheeting 2 may be corrugated or rigidised for extra strength. The container 1 has a pair of doors 6 at one end. At the other end, refrigeration apparatus of known type comprising a compressor 7 and associated circuitry is mounted within the frame 4. A goose neck tunnel 8 extends inwardly from the lower frame member 5 beneath the compressor, and a pair of fork pockets 9 extend across the bottom side members of the container to receive the blades of a forklift truck. A pair of fans 10 circulate air through the refrigeration circuitry and return the temperature controlled cooled or hot air to the interior of the container.

Referring to Figures 7 to 13, sectional views of a variety of structural members 5 of the invention are shown. Each member 5 is of generally box-section shape and is made from two or more parallel lengths of roll formed stainless steel. The lengths of Figures 7-12 are separated along their length at two locations to define thermal breaks. A pair of elongate bridging members 11 made from, e.g unplasticised polyvinylchloride each have a pair of slots 12 shaped to receive the complementary edges of the two lengths to hold the member 5

together. The bridging member 11 also defines a further slot 13 shaped, e.g to receive a rubber gasket seal 14. A flange 15 extends from one or more of the walls of the member 5, e.g to provide an anchorage for the cladding 2, 3. The members of Figures 7, 8, 11 and 13 are shaped so as to define a slot 20, e.g to receive a rubber gasket seal 21.

The members of Figures 11 and 12 are deeper than the others and are for use as the lower side frame members, and are arranged so that when the container is on the ground, a defined gap is present between the lower frame member and the ground.

The length of Figure 13 has no thermal break, but is otherwise similar to the length of Figure 7. The length of Figure 13 may be used, e.g as one of the frame lengths of a dry or non-refrigerated container where the requirements of low weight and high strength are just as useful.

Elongate reinforcing elements 22 comprising, e.g lengths of steel or stainless steel cylindrical tubing extend within the members 5 of Figures 8 and 10 to 13. A clearance 23 is present between the inside wall of the member 5 and the reinforcing element 22 and this clearance 23 may be left empty or filled, e.g with a thermally insulating foam material.

As shown in Figure 1 the frame 4 includes two longer side top members 5a made from lengths according to Figure 10 and lower side members 5b made from lengths according to Figure 12. The rear compressor end wall comprises vertical and horizontal cross members 5c formed from lengths according to Figure 10. The door end wall includes outer vertical side and upper horizontal members 5d formed from lengths according to Figure 8 and a lower horizontal member 5e formed from a length according to Figure 11. Transverse and vertical structural members 5f according to Figure 10 are welded to the frame forwardly of the compressor end wall.

The detail of a rearmost bottom corner connection is shown in Figures 14 and 15. A corner connector 25 is generally cube-shaped and has three orthogonal box section projections 26 from which extend cylindrical pegs 27, so that each projection 26 and peg 27 is shaped to complement the adjacent facing end of the member 5. A further cylindrical peg 27 extends upwardly from one face of the connector 25 (the top as shown) adjacent a projection 26. The corner connector 25 is inserted so that each peg 27 is received as a press fit within an adjacent reinforcing element 22 and the box section projection 26 is received within the member 5 and welded thereto. The presence of the second peg 27 on one face means that two reinforcing elements 22 may be placed vertically side-by-side at each corner of the frame, which ensures that a container can support the weight of many such containers stacked one above the other.

In one embodiment, holes (not shown) are provided within the walls of the longer side members 5b where they join the lower transverse member 5f. A further hole (not shown) in the lower transverse member 5f is in communication with one of the fans 9 so that cooled air may enter the transverse member 5f and then pass through both of the lower side members 5b. Further holes 30 (Figure 3) communicate between the door ends of lower side members 5b and the interior of the container. The cooled air may be arranged to pass along the reinforcing elements 22, or along the space 23. In such a case the container may include a flat stainless steel floor 31. In another embodiment, as best shown in Figure 12, the floor may comprise a corrugated stainless steel sheet or an aluminium "Tee" floor 32, which with a stainless steel sheet 33, sandwiches a layer of thermally insulating material 34. In this embodiment cooled air flows along the corrugations. The sandwich 32, 33, 34 may be installed as a complete unit to rest upon the flanges 14 of the lower side members 5b and may be adhered or riveted in place.

Figures 3, 4, 5 and 6 show the container wall having two doors 6 with hinges 35 and a locking mechanism 36. The doors 6 have two outer vertical and horizontal members 5g according to Figure 7; the left hand door has an inner vertical member 5h according to Figure 9 and the right hand door an inner vertical member 5i according to Figure 7. A gasket seal 21 is fixed in a slot 20 of the outer members 5d of the wall. The gasket 21 is seated behind a flange 15 of the outer vertical members 5g of the door 6. Further gasket seals 14 are received in slots 13 of the adjacent outer door members 5g and these seal against the opposing face of the outer frame member 5d. The inner vertical side members 5h, 5i of the doors both have gaskets 21 which seal behind flanges 15 and a further gasket 14 is received in a slot 13 in one of the inner vertical side members. Because the gaskets 14, 21 are hidden the seal is neat and attractive. The presence of double or treble gasket seals ensure that the door is especially well sealed to its frame.

The presence of the thermal breaks 11 in the frame members 5 ensure that a complete thermal break may be provided between the inner and outer walls and that the container is especially well insulated. The stainless steel members and the reinforcing elements ensure that the frame is strong, light and corrosion resistant.

## Claims

1. A transportable container comprising a frame (4) formed from elongate frame members (5) having a cladding (2,3) secured thereto, at least one of the frame members (5) including a thermal break along at least a portion of its length, characterised in that at least one of the frame members (5) comprises two lengths of metal which are joined together along a common edge by a bridging member (11) formed from a thermally insulating material to define a thermal break between the two lengths.

2. A container according to Claim 1 wherein the bridging member (11) comprises a length of unplasticised polyvinychloride.

3. A container according to Claim 1 or 2, including an elongate reinforcing element (22) to reinforce the frame member (5).

4. A container according to Claim 3, wherein at least one of the frame members (5) is of box cross-section and the reinforcing element (22) extends within the interior of the frame member (5).

5. A container according to Claim 4, including thermally insulating material in a space (23) between the reinforcing element (22) and the frame member (5).

6. A container according to Claims 3, 4 or 5, wherein the reinforcing element (22) comprises a length of piping.

7. A container according to Claim 6, wherein the reinforcing elements (22) and the frame members (5) are formed of steel or stainless steel.

8. A container according to Claim 6 or 7, wherein the frame members (5) are of box cross-section and three such members are joined together at least at one corner of the frame by a connector (25) having three orthogonal projections (26) which engage the facing end of the respective frame members, the projections (26) having pegs (27) which are received within the facing end portion of the tubular reinforcing element (22).

9. A container according to any preceding Claim, wherein the frame members (5) are hollow, and refrigeration apparatus (7) is mounted on the container, the refrigeration apparatus being adapted to pass temperature controlled gas through at least one of the hollow frame members (5) from the apparatus (7) and into the interior of the container through vent means (30).

10. A container according to any preceding Claim, wherein the floor (31) within the container comprises flat metal.

## Patentansprüche

1. Tragbarer Container, umfassend einen Rahmen (4), der aus länglichen Rahmenelementen (5) mit einer an diesen befestigten Auskleidung (2, 3) gebildet ist, wobei wenigstens eines der Rahmenelemente (5) eine Wärmesperre entlang wenigstens eines Teils seiner Länge aufweist, dadurch gekennzeichnet, daß wenigstens eines der Rahmenelemente (5) zwei Metallstücke aufweist, die entlang einer gemeinsamen Kante durch ein von einem wärmeisolierenden Material gebildetes Überbrückungselement (11) zusammengefügt sind, um eine Wärmesperre zwischen den beiden Stücken zu definieren.

2. Container nach Anspruch 1, wobei das Überbrückungselement (11) ein Stück weichmacherfreies Polyvinylchlorid aufweist.

3. Container nach Anspruch 1 oder 2 mit einem länglichen Verstärkungselement (22) zum Verstärken des Rahmenelements (5).

4. Container nach Anspruch 3, wobei wenigstens eines der Rahmenelemente (5) ein Kastenprofil aufweist und das Verstärkungselement (22) im Inneren des Rahmenelementes (5) verläuft.

5. Container nach Anspruch 4 mit einem wärmeisolierenden Material in einem Raum (23) zwischen dem Verstärkungselement und dem Rahmenelement (5).

6. Container nach Anspruch 3, 4 oder 5, wobei das Verstärkungselement (22) ein Stück Rohrleitung aufweist.

7. Container nach Anspruch 6, wobei die Verstärkungselemente (22) und die Rahmenelemente (5) aus Stahl oder Edelstahl ausgebildet sind.

8. Container nach Anspruch 6 oder 7, wobei die Rahmenelemente (5) ein Kastenprofil aufweisen und drei solcher Elemente an wenigstens einer Ecke des Rahmens durch ein Verbindungselement (25) mit drei orthogonalen Vorsprüngen (26) verbunden sind, die in das gegenüberliegende Ende der entsprechenden

Rahmenelemente eingreifen, wobei die Vorsprünge (26) Zapfen (27) aufweisen, die in dem gegenüberliegenden Endabschnitt des röhrenförmigen Verstärkungselementes (22) aufgenommen werden.

**9.** Container nach einem der vorhergehenden Ansprüche, wobei die Rahmenelemente (5) hohl sind und wobei eine Kühlvorrichtung (7) auf dem Container montiert ist, die Gas mit geregelter Temperatur durch wenigstens eines der hohlen Rahmenelemente (5) von der Vorrichtung (7) und durch Belüftungsmittel (30) in das Innere des Containers führt.

**10.** Container nach einem der vorhergehenden Ansprüche, wobei der Boden (31) in dem Container Flachmetall aufweist.

**Revendications**

**1.** Conteneur transportable comprenant une armature (4) formée d'un cadre avec éléments allongés (5) sur lesquels est fixé un bardage (2,3), au moins un des éléments du cadre (5) étant pourvu d'une barrière thermique sur au moins une partie de sa longueur, caractérisé en ce qu'au moins un des éléments du cadre (5) comprend deux barres de métal qui se rejoignent le long d'un bord commun par un élément-pont (11) formé à partir d'une matière thermique isolante déterminant une barrière thermique entre les deux barres.

**2.** Conteneur conforme à la Revendication 1 et dans lequel l'élément-pont (11) inclut un morceau de polyvinylchlorure non plastifié.

**3.** Conteneur conforme aux Revendications 1 ou 2, comprenant un élément allongé de renforcement (22) pour renforcer l'élément du cadre (5).

**4.** Conteneur conforme à la Revendication 3, et dans lequel au moins un des éléments du cadre (5) a la forme d'un boîtier en coupe transversale et l'élément de renforcement (22) s'étend à l'intérieur de l'élément du cadre (5)

**5.** Conteneur conforme à la Revendication 4, qui inclut une matière thermique isolante dans un espace (23) compris entre l'élément de renforcement (22) et l'élément du cadre (5).

**6.** Conteneur conforme aux Revendications 3, 4 ou 5, dans lequel l'élément de renforcement (22) comprend un morceau de tuyau.

**7.** Conteneur conforme à la Revendication 6, et dans lequel les éléments de renforcement (22) et les éléments du cadre (5) sont fabriqués en acier ou en acier inoxydable.

**8.** Conteneur conforme aux Revendications 6 ou 7 et dans lequel les éléments du cadre (5) ont la forme d'un boîtier en coupe transversale et trois de ces éléments sont joints au moins à un coin de l'armature par un connecteur (25) muni de trois projections orthogonales (26) qui s'engagent dans l'extrémité frontale des éléments respectifs du cadre, les projections (26) étant pourvues de chevilles qui s'adaptent dans la portion de l'extrémité frontale de l'élément tubulaire de renforcement (22).

**9.** Conteneur conforme à une quelconque des Revendications précédentes, et dans lequel les éléments du cadre (5) sont creux et un appareil de réfrigération (7) est monté sur le conteneur, l'appareil de réfrigération étant adapté pour laisser passer du gaz contrôlé par température par au moins un des éléments creux du cadre (5) de l'appareil (7) et pénétrer à l'intérieur du conteneur au moyen d'orifices (30).

**10.** Conteneur conforme à une quelconque des Revendications précédentes, et dans lequel la base (31) de l'intérieur du conteneur inclut du métal plat.

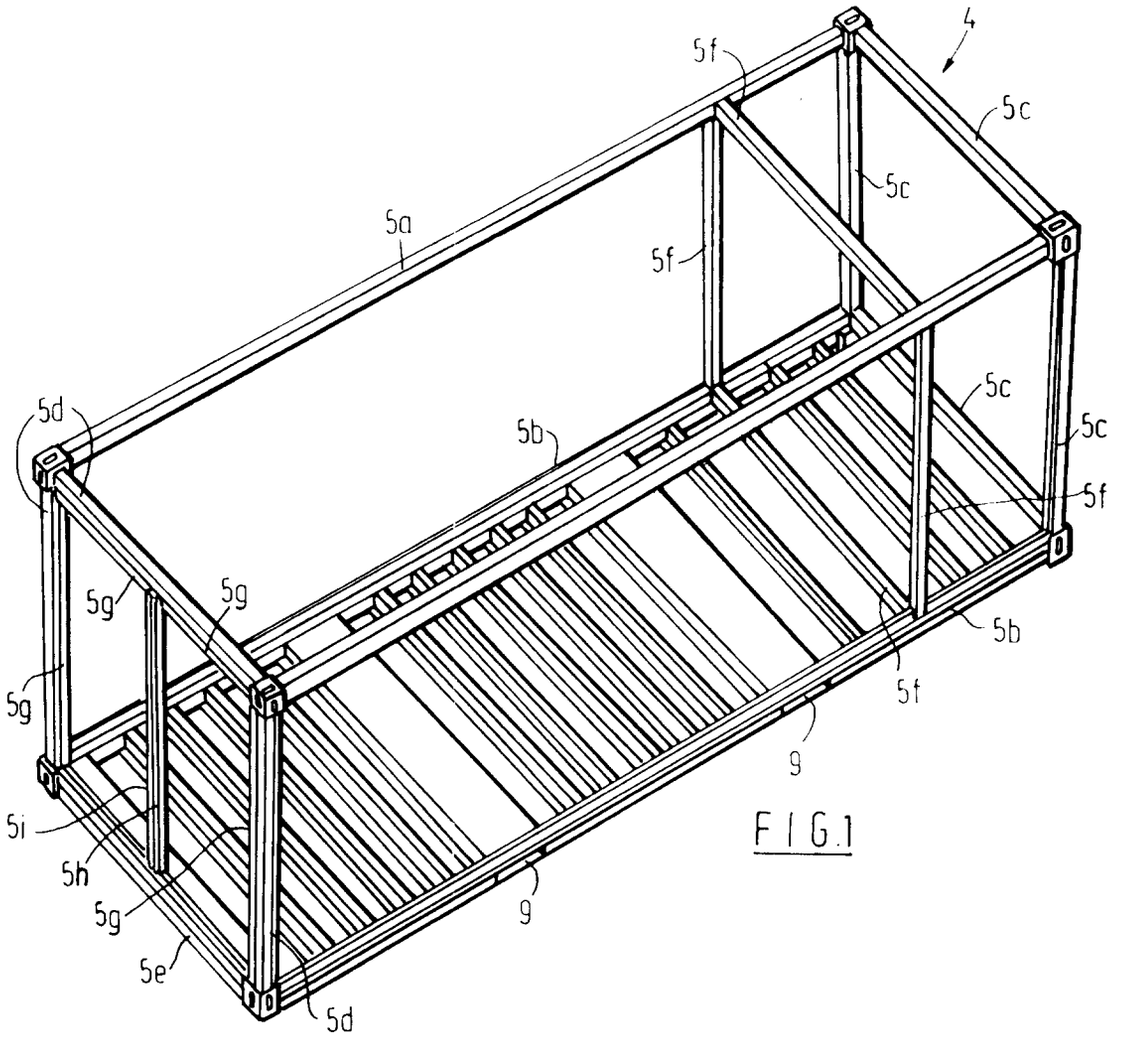
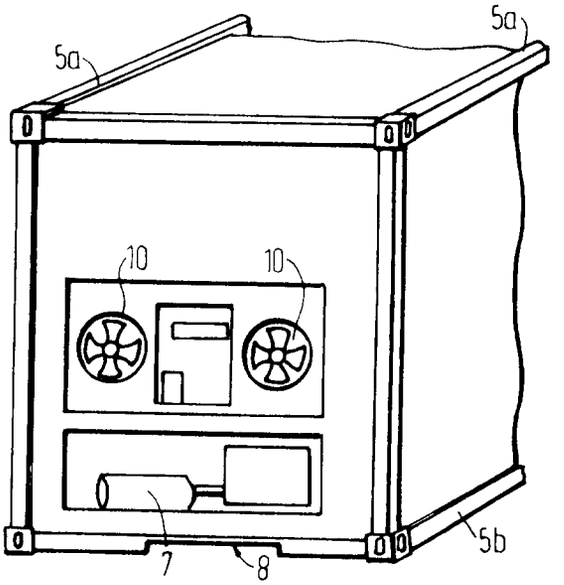

4
5f
5c
5c
5a
5f
5d
5b
5c
5c
5f
5g
5g
5b
5g
5f
9
5i
5h
5g
9
5e
5d

FIG.1


5a
5a
10
10
5b
7
8

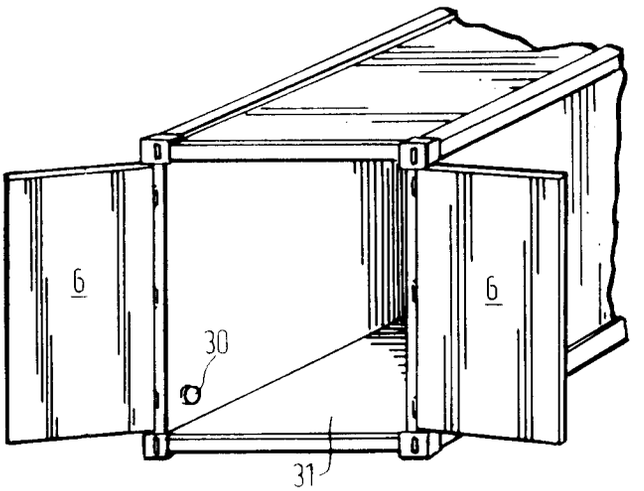



FIG.3

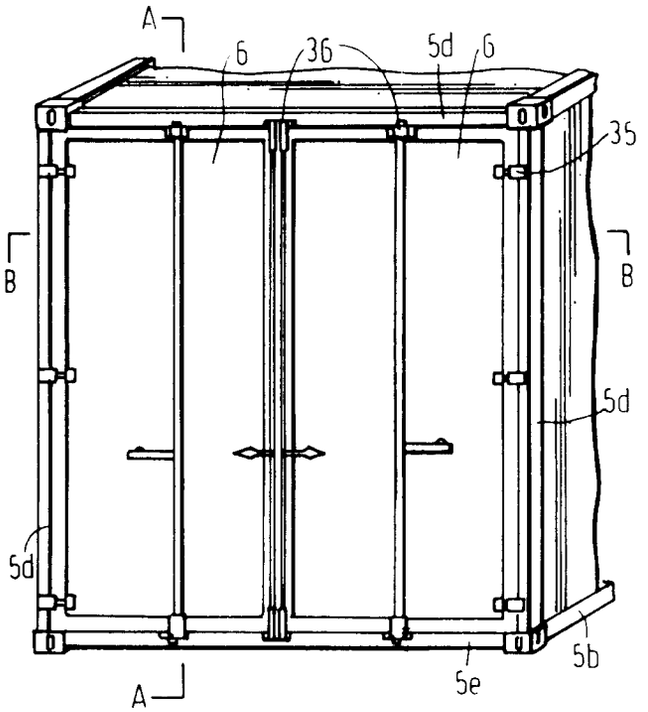



FIG.4

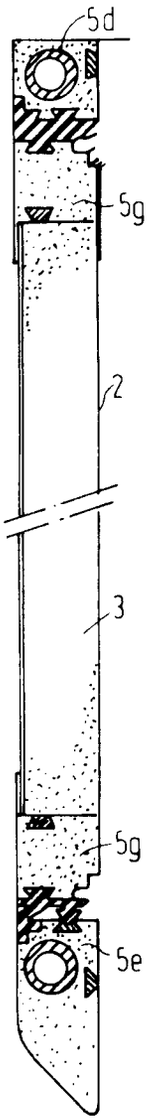



FIG.5

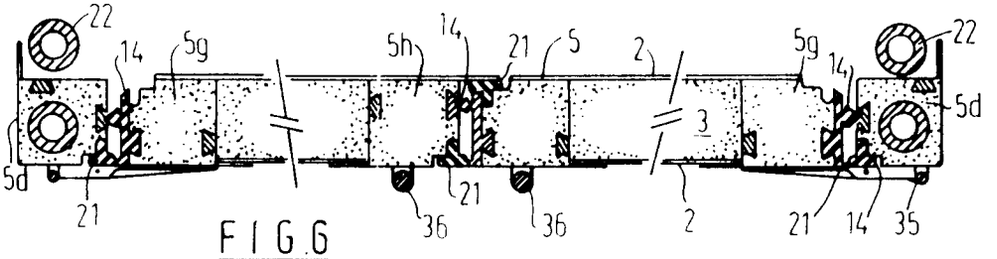



FIG.6

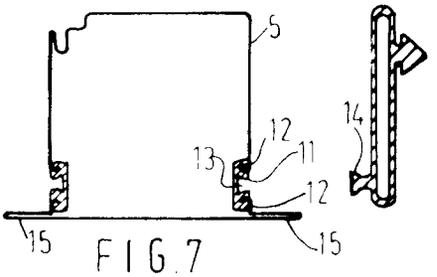



FIG.7

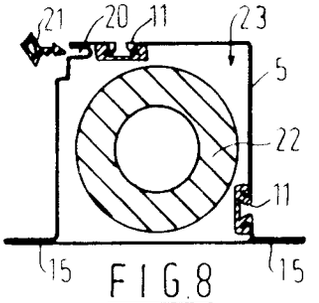



FIG.8

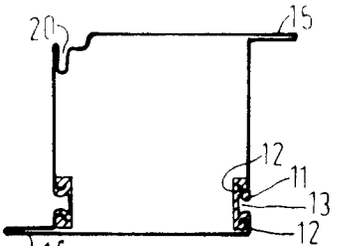



FIG.9

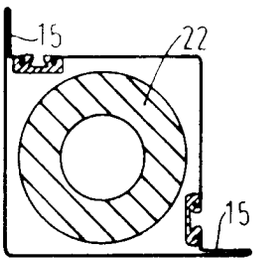



FIG.10

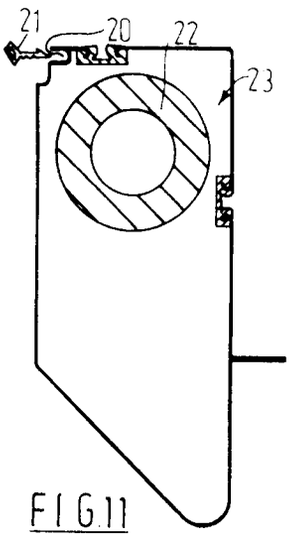



FIG.11

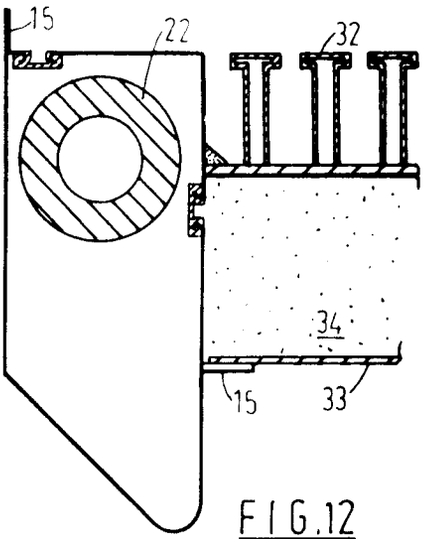



FIG.12

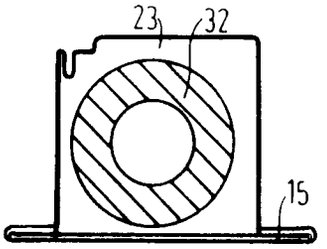



FIG.13

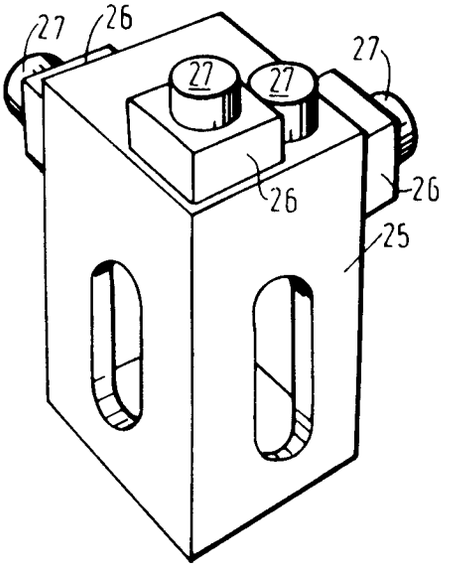



FIG.14

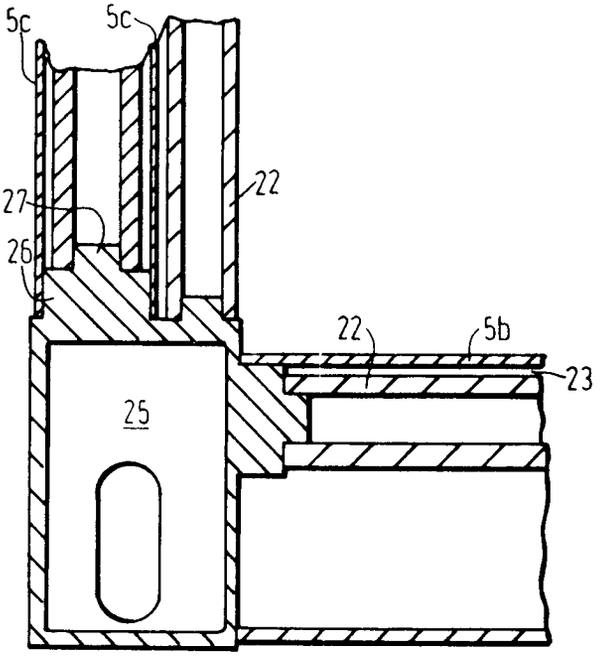



FIG.15