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(54) Containers for Air Freight

(57) A container is made of profiled rods or spars (2—9) which form a structural frame which is covered at least in part by-sheeting, fabric or the like (D, E, F, G) such that the covering acts in tension. This tension is counteracted by compressive elements (2, 3) in the frame of the container. The sheets (D, E, F, G) include look-sectioned edge members (21) which engage projections on the rods (5, 7, 8, 9). Tensioning is effected by screw-adjustment of corner connectors joining the rods (5, 7, 8, 9) to the elements (2, 3) in order effectively to increase the spacing of side wall frames (4) defined by the rods (5, 7, 8, 9).

FIG.1

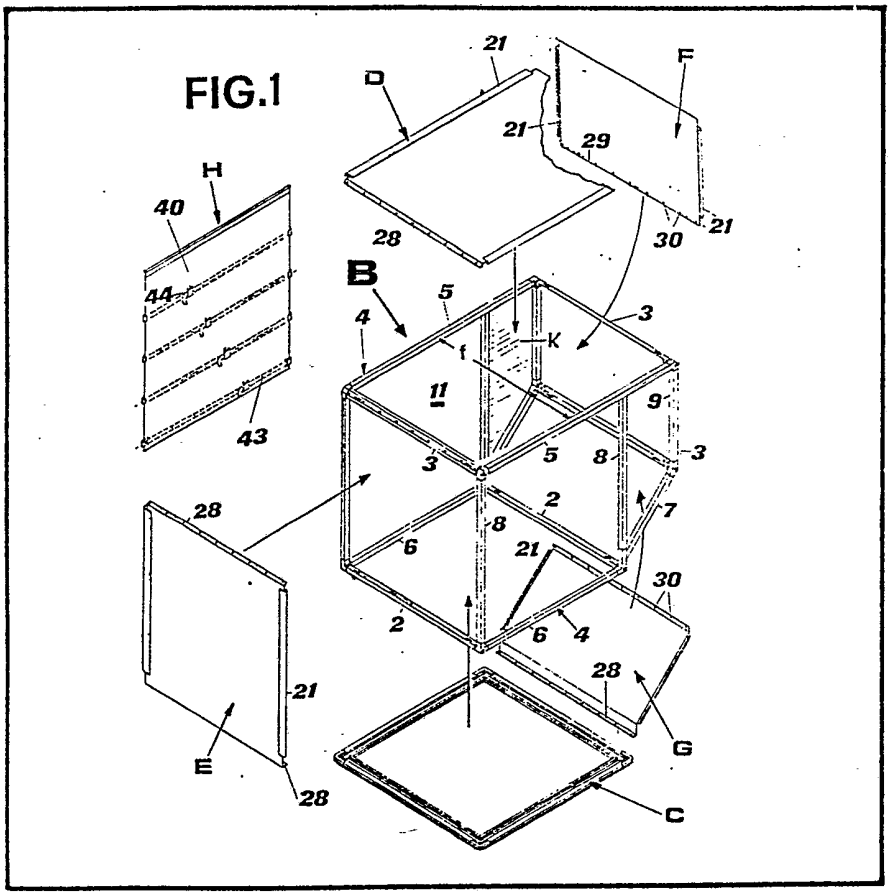

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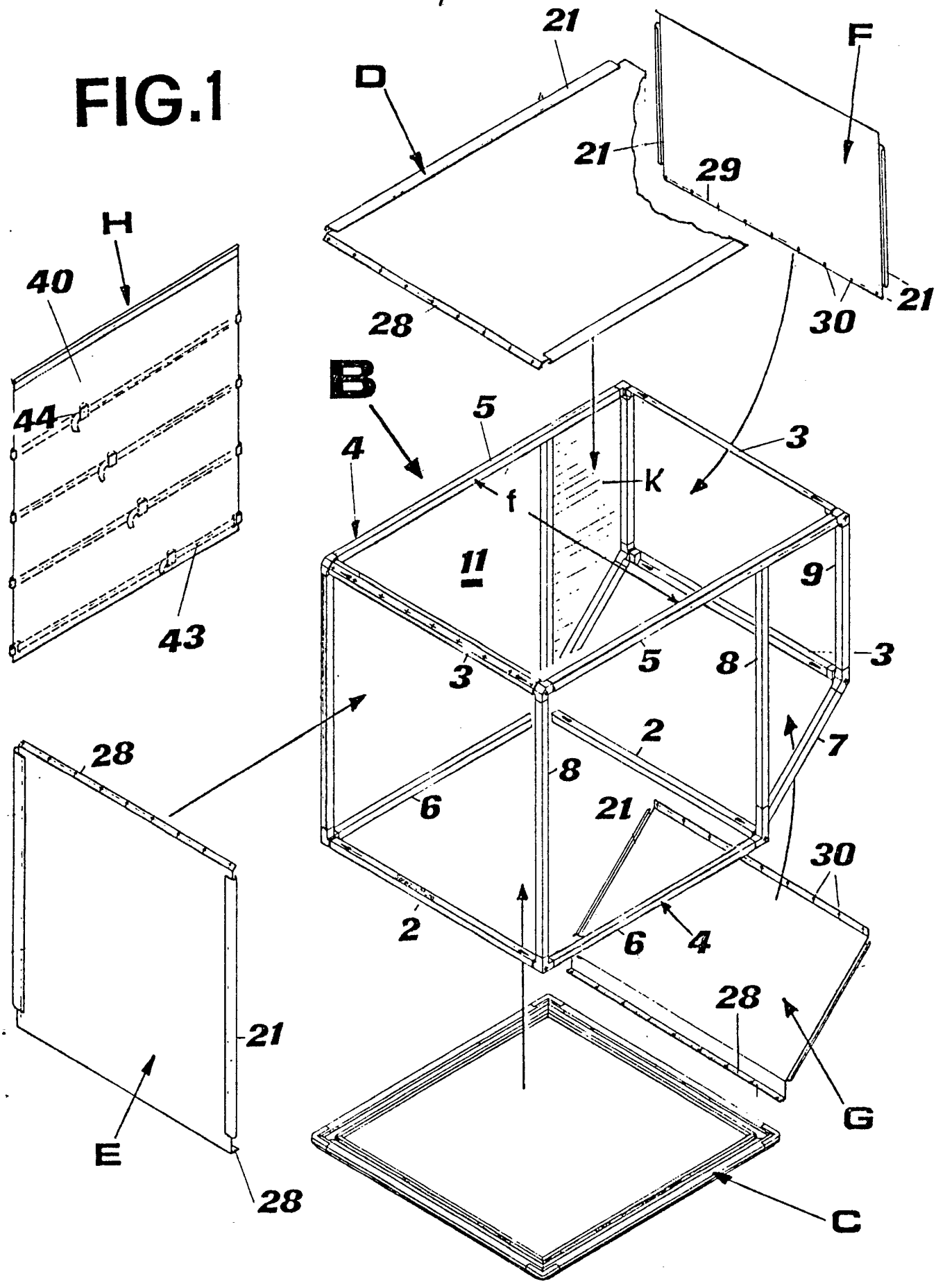
FIG.1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F
21
29
H
40
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21
28
B
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5
4
3
f
K
11
9
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5
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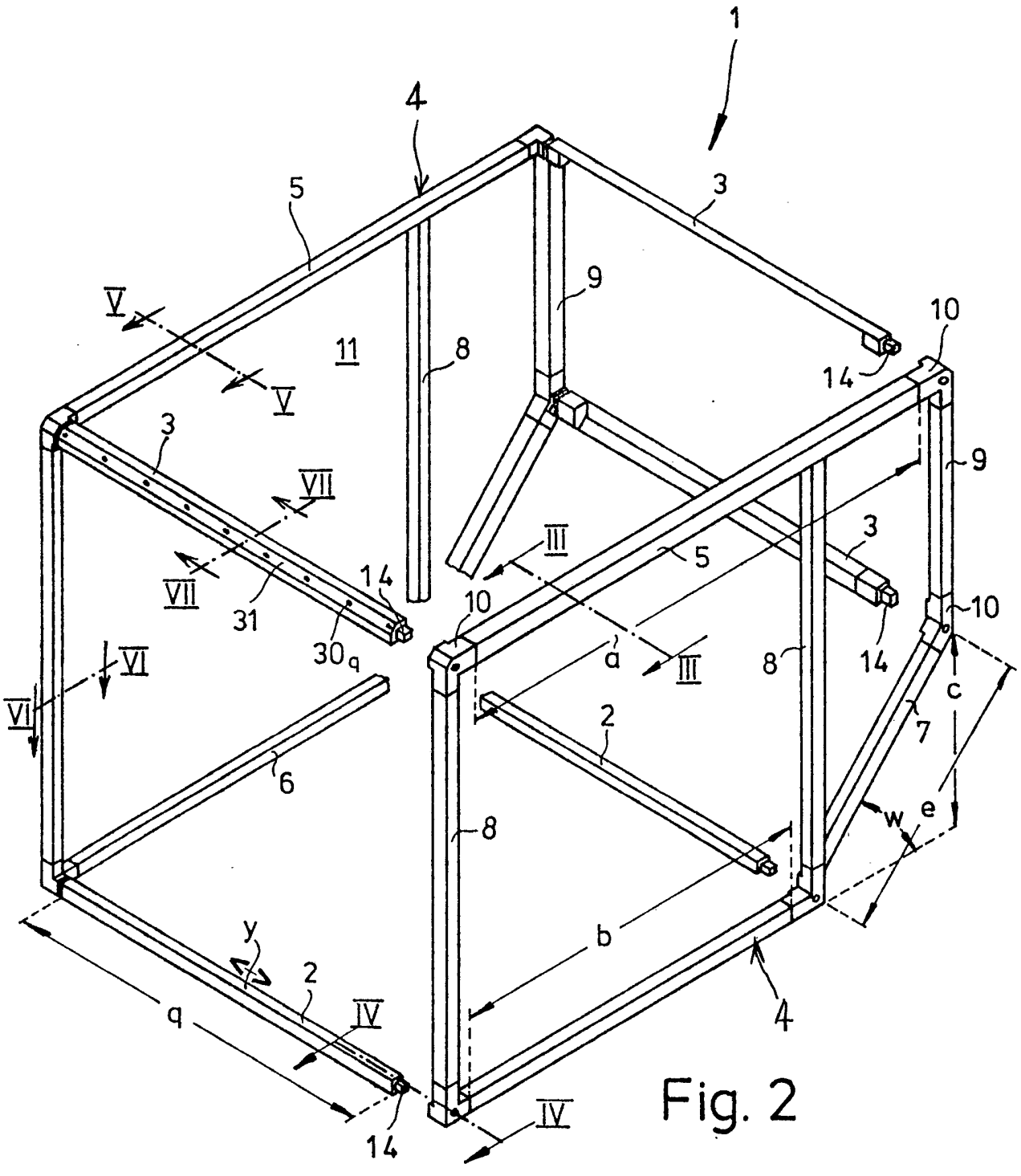
2
7
28
8
6
21
30
2
6
4
28
G
21
E
28
C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4
5
3
9
10
14
V
V
11
8
3
VII
VII
31
30q
14
III
III
5
3
9
10
10
14
8
a
VI
VI
6
2
7
c
8
w
e
y
2
IV
q
14
IV
b
4

Fig. 2

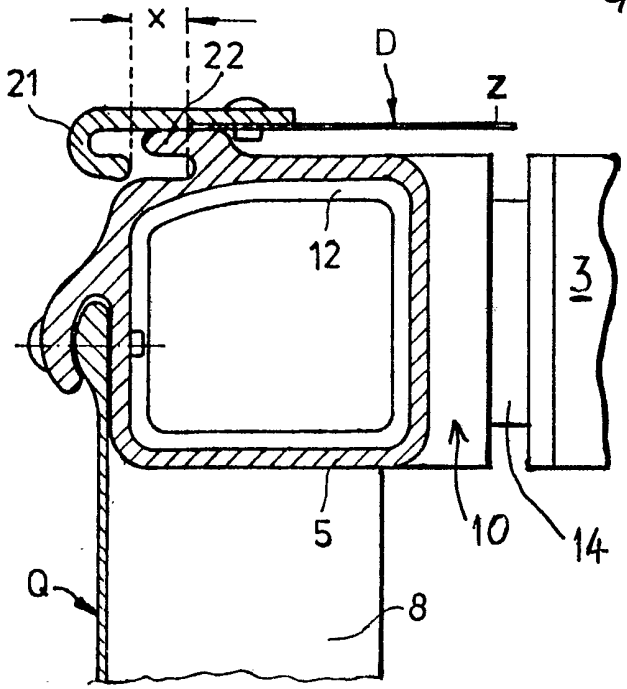

Fig.3

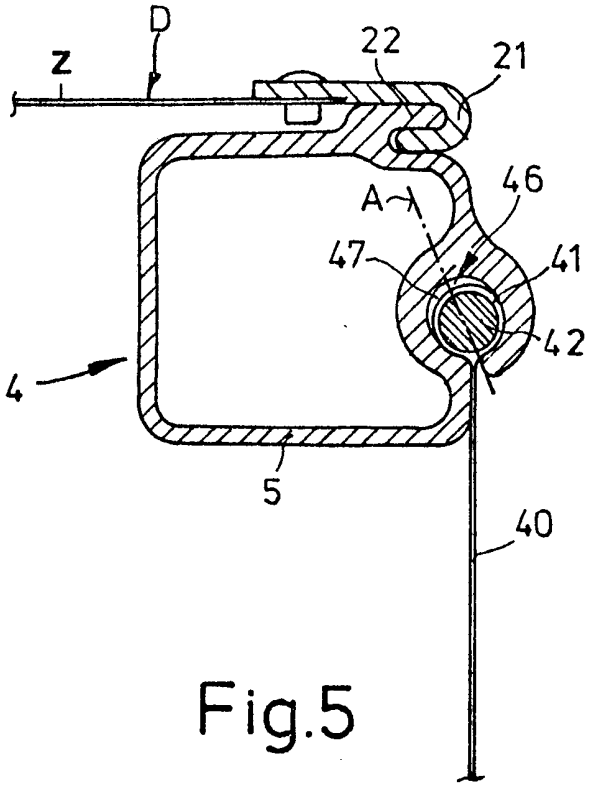

Fig.5

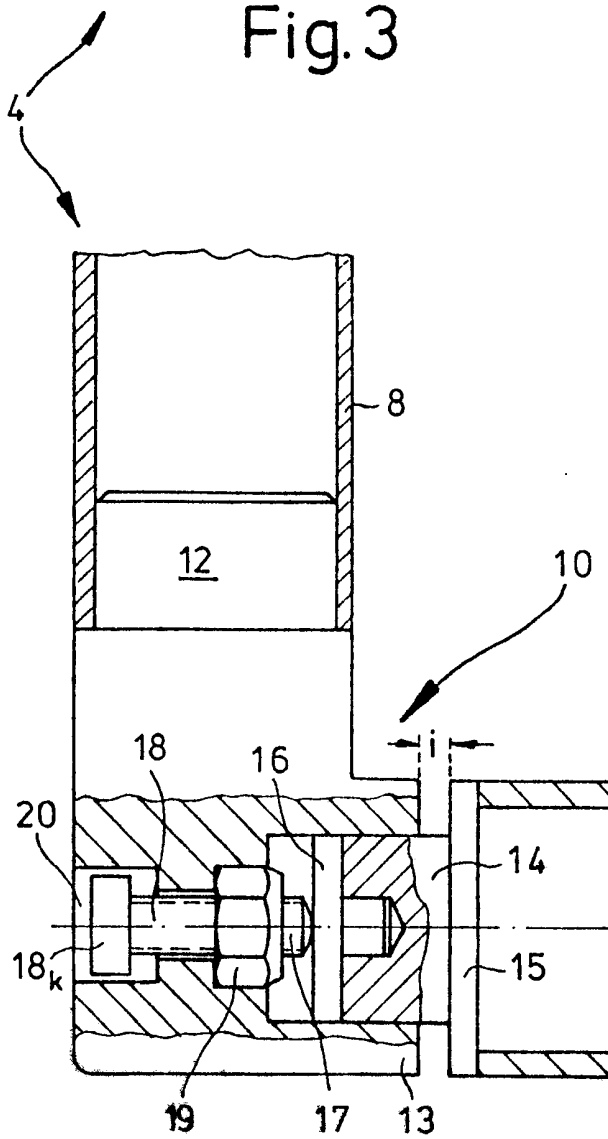

Fig.4

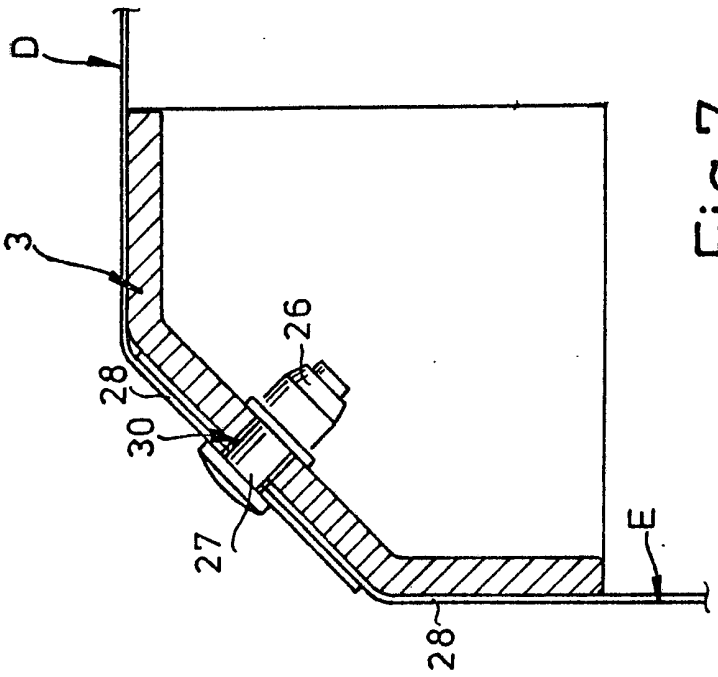

Fig.7

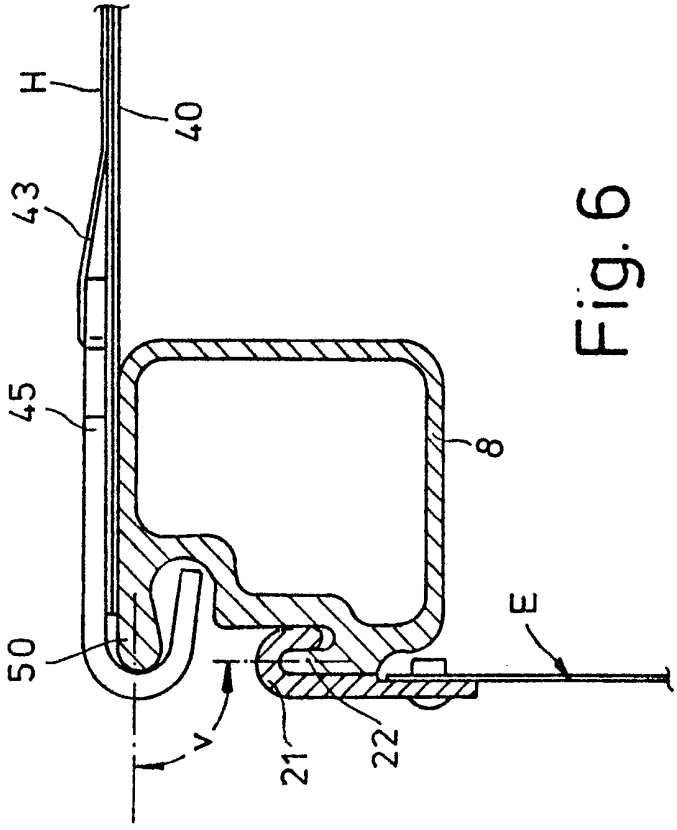

Fig.6

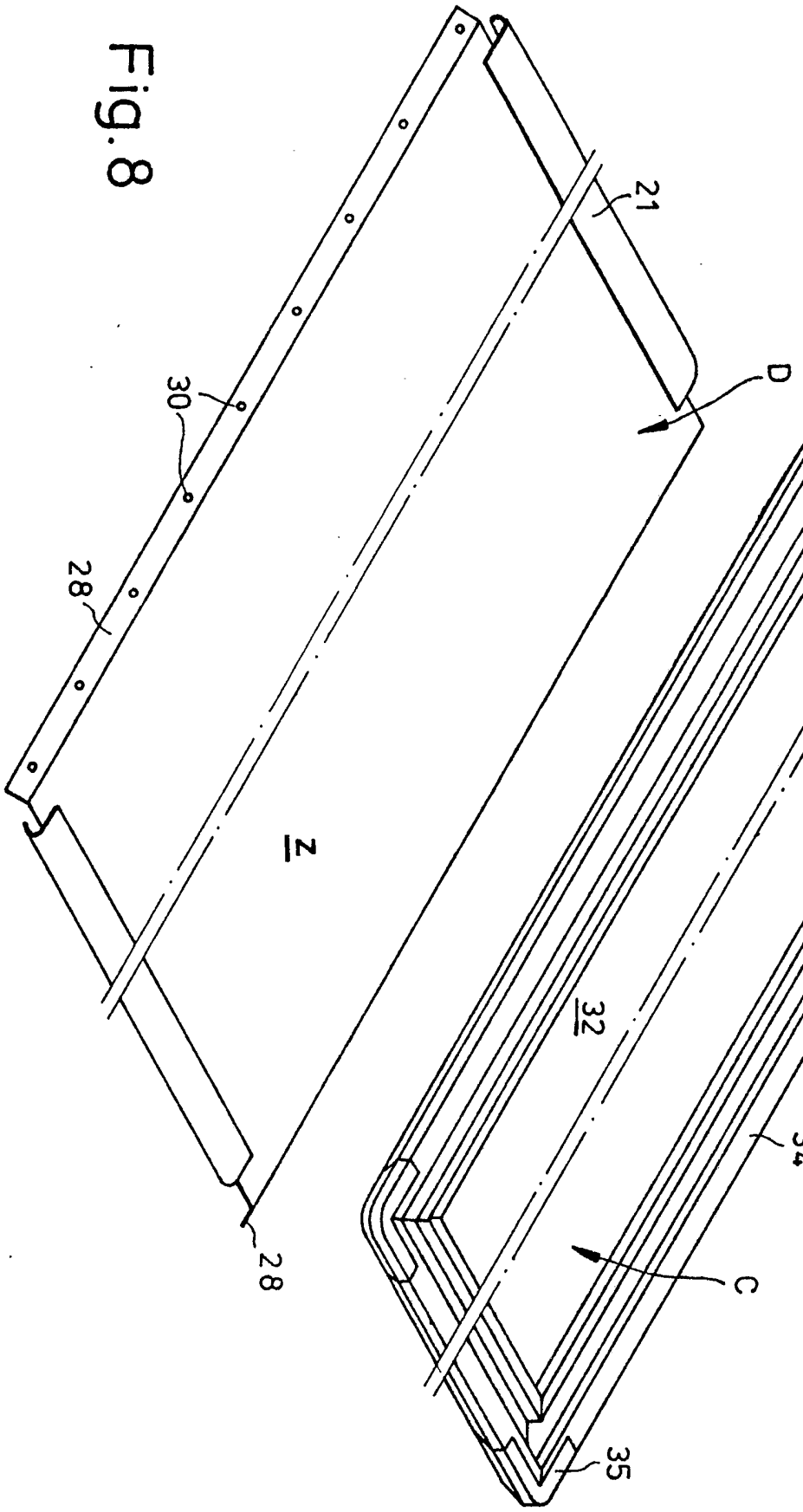

Fig.8

Fig.9

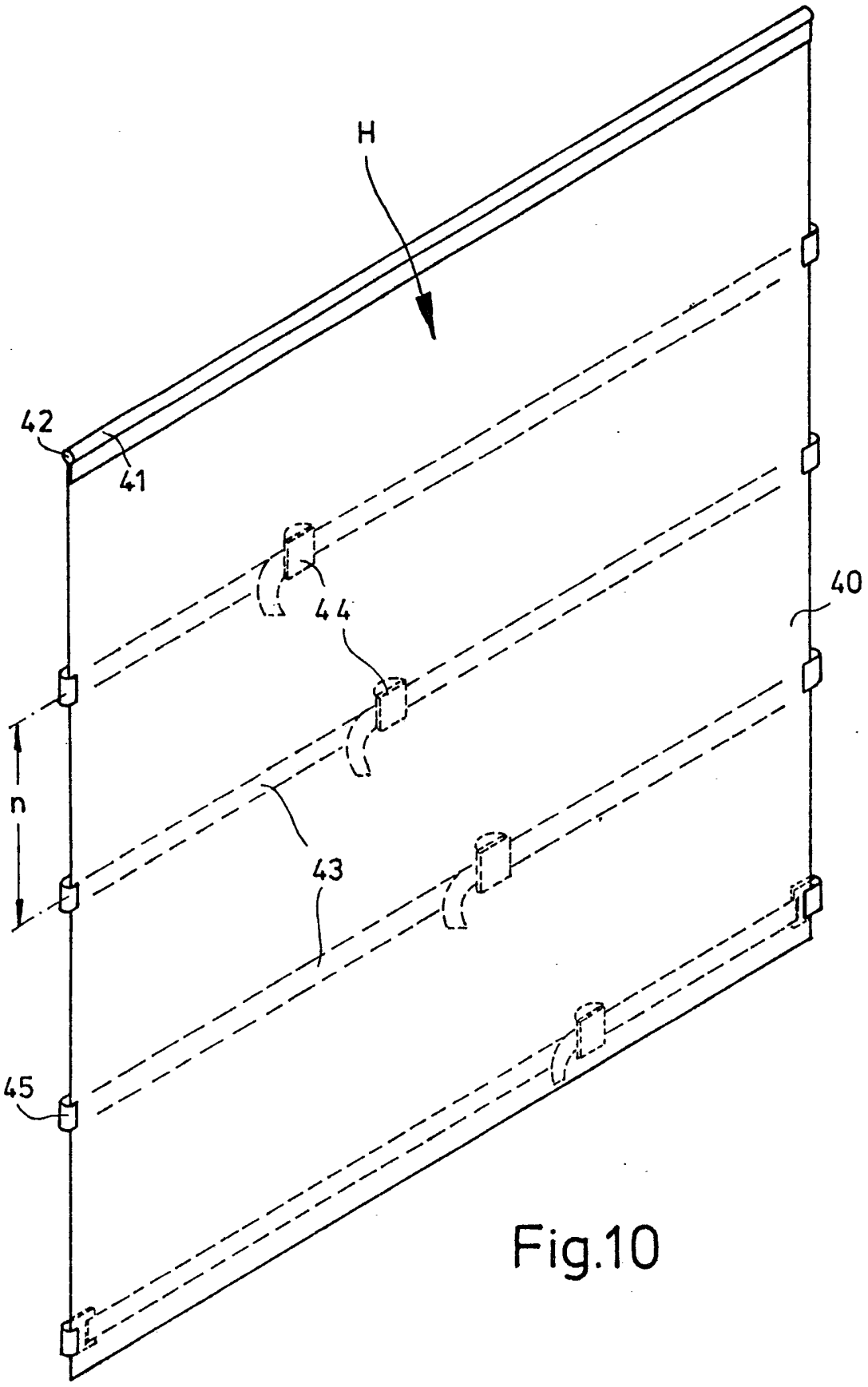

Fig.10

SPECIFICATION

Containers, in Particular for Transporting Freight by Air

The invention relates to containers designed in particular for transporting freight by air and having profiled rods or the like struts and spars forming a supporting frame, which is covered at least in part by metal sheet, fabric or the like providing an outer "skin" for the container.

Such containers of the kind available at present suffer from the disadvantage that parts damaged by rough handling can be repaired only at high expense; the metal sheet, planks or panels are rivetted to the supporting frame and therefore cannot be replaced easily.

Replacement of individual, damaged container parts by new undamaged parts is possible in so-called panel type constructions in which each surface or wall of the container is made up of a special frame with a covering. The advantage of easy exchangeability and a high degree of stability of corners or edges produced by fitting together two struts or sections of a panel or panels is achieved at the expense of an undesirable increase in weight, which is unattractive, in particular with respect to the use of such containers for transporting freight by air.

It is therefore an object of the invention to develop a container for freight transport, of the kind mentioned at the beginning, having low weight and high stability, the surfaces or walls of which are easily exchanged and can be prefabricated in a simple manner.

This object is achieved by way of the invention in that the covering or a piece of the covering is mounted on certain of the profiled rods which are spaced apart and are to be joined, in such a way that the said covering or piece of covering acts in tension, and counteracting this tension are compressive elements in the frame of the container.

In another, from the technical standpoint poorer solution, within the scope of the invention, the covering includes pieces of rigid material, introduced as a compressive element between the profiled rods which are to be joined.

In both cases it is advantageous for a component acting in tension to have hook-shaped sections which point against the direction of tension, and can be releasably connected to opposed, cooperating members on the profiled rods.

In a particularly favourably designed container a plurality of profiled rods are fitted together to provide a sidewall frame for the container, two such sidewall frames are positioned at a distance facing each other and are joined by transverse spars attached at or near the corners of the frame, and covering pieces acting in tension are fitted between the two sidewall frames.

For example the covering sheets for roof and sides are fitted via their hookshaped sections to the two above-mentioned sidewall frames and the distance between the sidewalls is then increased by means of the transverse spars until the sidewall frames and covering sheets engage firmly with each other.

The rods constituting the sidewall frames can either be welded together at the corners or be connected by means of connecting pieces which simultaneously provide a means of connecting the transverse spars; in accordance with a further feature of the invention the transverse spar then has at its end a plug which is slid in a telescopic manner into an appropriately shaped socket on the profiled rod where it can be moved by means of an adjustment device which serves as a stop for the end of the transverse spar, for example by means of screws or spindles. It is also conceivable to make the transverse spars such that the length of the spars themselves could be varied.

Two opposite edges of the covering sheets, panels or the like have the above mentioned hook-shaped sections fitted to them; these sections can be specially made and rivetted or otherwise attached to the covering, or they can be provided by shaping the covering material itself into the appropriate form at these places. The other two edges may be provided with holes or the like through which are fitted screws or push-fit connecting pieces, passing through similar holes in the transverse spars. This provides extra stability to the construction in addition to the effect of the bracing of the panels and the frame as described earlier.

The production of containers is made much easier, as it is no longer necessary to rivet or weld all edges of the panels to the profiled rods; instead production can begin with coiled or stacked sheet, the provision of the hook-shaped sections is necessary on only two sides, the bending, boring, separation of two cover sheets may even be possible in a continuous process.

A further advantage is that containers of different width can be produced simply by changing the length of the transverse spars and the breadth of the covering sheets without requiring any special alterations in the basic construction itself.

It is also within the scope of the invention to provide a door which is light and can be quickly mounted. To this end, a door made of a flexible material is introduced into an opening surrounded by four profiled rods. This door is secured along one edge—preferably on the overhead rod of the doorway—and is releasably attached to the sideposts of the doorway by a series of hook-like members. A folded seam of the door material—which can be pushed into an undercut groove in the overhead rod—serves as the securing means. The so-called rolled seams are generally known, for example in the text of the German utility model 1 957 424.

It has been found to be particularly useful for the door of the invention to make the undercut part of the groove oval in cross section and its major axis to run approximately in the plane of the doorway; this causes the secured edge of the door to jam itself in the groove in the overhead

rod of the doorway. The cross section of the groove can also be made to taper towards the mouth of the groove to increase the jamming action of the door.

In contrast to the normal container doors, which have transverse aluminium sections and are closed by locks, the door proposed can have flexible belts which are provided with hook-shaped members at their ends; these hooks engage in grooves in the profiled rods. The flexible belts are tightened and locked by means of conventional buckles.

Further advantages, features and details of the invention will now be described in relation to the following preferred exemplified embodiment of the invention, with the help of the accompanying drawings viz.,

Figure 1. An exploded view of a container, in perspective and showing the individual parts which fit on to the container frame.

Figure 2. An enlarged view of the frame shown in Figure 1.

Figure 3. An enlarged cross section through a part in Figure 2, sectioned along the line III—III and with another part fitted onto the sectioned component.

Figure 4. An enlarged detail from Figure 2, partly sectioned along the line IV—IV.

Figure 5. Another enlarged detail from Figure 2, sectioned at approximately line V—V, showing a cross-sectional shape alternative to that illustrated in Figure 3.

Figure 6. Another enlarged detail, sectioned along the line VI—VI in Figure 2.

Figure 7. A further detail from Figure 2, in this case the section running along line VII—VII.

Figures 8 to 10. Components from Figure 1 shown on a larger scale.

A container B, used in particular for transporting freight by air, has a frame 1 (Figure 2) which determines the shape of the container, a square shaped base C, a roof panel D, wall panels E, F and G forming the end walls, and a door H at the side.

The individual part C to H in Figure 1 are shown separated from the frame; on the other hand a sidewall panel K, which meets panels F and G at the edge, is shown in place in the frame 1. The front side of the container facing the viewer can likewise be closed off by a door H and a side panel K, or else by another wall panel Q (Figure 3).

The frame 1 itself comprises two sidewall frames 4 joined by transverse spars 2, 3 of length q; each of the frames 4 is made up of a section 5 (length a, for example 200 cm), a shorter section 6 at the bottom of length b (e.g. 150 cm), a section 7 inclined to the base section 6 at an angle w in the plane of the frame, and three vertical supports 8 and 9, with connecting pieces 10 at the corners.

The vertical support rod 9 which is assigned to the rear panel F is shorter than the other two vertical supports by a length c which represents the side facing the angle w in a triangle in which the sloping section 7 forms the hypotenuse e. The long vertical supports 8 of the sidewall frame flank an opening 11 for a door H, or a panel Q of the same size as door H. The panel Q can alternatively extend over the whole of the sidewall frame 4.

As is revealed particularly well in Figures 3 and 4, which are aligned appropriately with one another, the top section 5 and the vertical supports 8 of each sidewall frame 4 are of a box-like section, in which the corner pieces 10 are mounted by push-fit parts 12 or by some other means. Plugs 14 on end fittings 15 on the transverse spars 2 (and 3) fit into box-shaped sockets 13 which point towards the spars 2 (and 3). A pressure plate 16 on plug 14 rests in contact with the free end 17 of an adjusting screw 18 which can be turned from the outside of the frame. The adjusting screw 18 runs in a nut 19 held by the corner piece 10; the head 18_k of the screw 18 is contained and moves in a recess 20 in the corner piece 10.

If for example the roof panel D is laid on the top sections 5 on both long sides of the container B, such that (as in Figure 3) the hook-shaped sections 21 rivetted to the edges of sheet Z of the roof panel D do not engage in the cooperating recesses defined by the projections 22, then the hook-shaped sections 21 and the projections can be engaged with one another by pushing the side frames outwards in directions y (Figure 2). To this end, the distance i between the fittings 15 at the ends of the transverse spars 2 and 3 and the end face of the boxshaped sockets 13 of the corner pieces 10 is increased by the relevant adjusting screws 18; the distance by which the sidewall frame 4 is displaced is indicated by x in Figure 3; the distance between the top sections 5 determined by the roof panel D and the transverse spars 3 is denoted by f (Figure 1).

Figures 5 and 6 illustrate the proper resting position for the hook-shaped section 21 of the roof panel D in engagement with the projection 22 on the top section 5. In the assembled position the sidewall frames 4 are stable, being braced between the roof panel D and the wall panels E, F, G, which apply tension, and the transverse spars 2, 2, 3, 3, 3, which apply compression.

When the container B has been put together in this manner, the roof panel D is screwed onto the spars 3, 3, by means of nuts 26 on screw bolts 27 or so-called Huck bolts. The wall panels are similarly screwed onto the spars 3, 2. To this end the roof panels D and the wall panels E, F, G are provided at the edges 28, 29 (Figure 1) with a series of holes 30 which can be aligned with corresponding holes 30_q in the spars 2, 3. The edges 28 in the roof section, the large end panel E and the wall panel F are bent approximately 45° out of the plane of the panels; the lower edge of inclined panel G as viewed in the assembled position, is in fact bent twice. Bending the edge regions 28 makes them—and the corresponding surfaces 31 (Figure 2) on the transverse spars 2

and 3—readily engageable for the bolting operation.

After the initial assembly and bracing of the parts together under tension and compression, the base C, which is made up from a panel 32 and a frame 33 of sections 34 and corner pieces 35, is put into position under the container B and is secured there, for example by means of bolts.

The door H comprises a covering 40 with a round rod 42 held in a pocket 41 at the top. There are also horizontal belts 43 at a vertical spacing n apart, and having tightening buckles 44, and hooks 45 at the ends.

As shown in Figure 5, to secure the door H to the frame its pockets 41 at the end—reinforced by the round rod 42 to form a rolled seam—is pushed into an undercut groove 47 defined by a channel-shaped profile 46 on one side of the top section 5. Because of the oval shape of the cross section of groove 47, which is shown clearly in Figure 5, the rolled seam 41—42 is held securely in place by its own weight. The major axis A of the inner part of the groove 47 runs approximately in line with the plane of the doorway.

A projection 50 (Figure 6) pointing away from the opening 11 for the door is provided for the belt hooks 45 on each of the long, vertical supports 8. Viewed in cross section, the projection 50 forms a right angle v with projection 22 for the hook-shaped section 21 on the end wall E.

Claims

1. A container—in particular for transporting freight by air—made of profiled rods or the like struts or spars which form a structural frame covered over at least in part by a skin of metal sheet, fabric or the like, in which the covering or a piece of the covering is mounted on certain of the profiled rods which are spaced apart and are to be joined, in such a way that the said covering or piece of covering acts in tension, and counteracting this tension are compressive elements in the frame of the container.

2. A container according to claim 1, in which a component acting in tension has hook-shaped sections which point against the direction of tension, and can be releasably connected to opposed, cooperating members on the profiled rods.

3. A container according to claim 1 or 2, in which, associated with the compressive elements, there are separate adjusting devices which alter the spacing between the certain profiled rods.

4. A container according to any of claims 1 to 3, in which transverse spars act as compressive elements between the rods, and at least one end of a spar is fitted into a socket in such a way that it can be moved but also can be made fast.

5. A container according to claim 3 or claim 4, in which the spar is provided at the said end with at least one plug which is slid in a telescopic manner into an appropriately shaped socket on the profiled rod where it can be moved by means of an adjustment device which serves as a stop for the end of the transverse spar.

6. A container according to any of claims 3 to 5, in which a screw or spindle serves as the adjusting device, runs coaxial with the transverse spar and rests against the end of the spar or the end face of the plug.

7. A container according to claim 6, in which the tubular socket and the adjusting device are provided as part of a connecting piece between at least two neighouring rods.

8. A container according to any of claims 1 to 7, in which a plurality of profiled rods are fitted together to provide a sidewall frame for the container frame, and two sidewall frames spaced at a distance apart form, together with transverse spars approximately at the corners, the frame of the container.

9. A container according to claim 8, in which covering pieces are mounted in tension between the two sidewall frames, the other two edges being attachable to the transverse spars by means of screws or push-fit components.

10. A container according to any of claims 1 to 9, in which four profiled rods surround a doorway which is closed over by a door, which can be releasably fixed to the profiled rods by hook-shaped fittings.

11. A container according to claim 10, in which the door is formed by a flexible material and has a rolled seam which rests in an undercut groove in a profiled rod running above the doorway, the groove having an oval cross section, the major axis of which runs approximately in the plane of the doorway.

12. A container according to claim 11, in which the cross section of the groove tapers towards the mouth of the groove.

13. A container according to any of claims 10 to 12, in which the covering forming the door is provided with flexible belts which run approximately parallel to the rolled seam, have hook-like members at their ends, and can be altered in length by means of buckles.

14. A container according to any of claims 1 to 13, in which a box-shaped rod has on each of two neighbouring sides a projection defining a groove.

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