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(71) Applicant: **South African Polymer Holdings (Proprietary) Limited**
Spanner Road
Clayville Transvaal Province(ZA)

(72) Inventor: **Warwick, Michael James**
6 Galeniet Street Jukskei Park
Randburg Transvaal Province(ZA)

(74) Representative: **Hulse, Thomas Arnold et al**
Hulse & Co. Cavendish Buildings West Street
Sheffield S1 1ZZ(GB)

(54) A crate.

(57) This invention provides a crate (10) having a body (12) with a cavity for receiving a plurality of containers and a base (16) with floor surfaces (18) on which the containers can be supported. A crate insert (14) is located in the cavity to provide a spacer arrangement above the base (16) of the body (12) for separating containers in the crate (10) from one another. The crate body (12) can be a relatively thin-walled body of plastics material and the crate insert (14) can have reinforcement (46) for providing the body (12) with support against flexing. The crate body (12) and insert (14) preferably have complementary formations for securing the insert to the body, locating the insert and further strengthening the crate. The base (16) of the crate body (12) can be designed to rest on the tops or necks of containers in a subjacent crate.

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This invention relates to crates, particularly but not exclusively - for bottles or other containers.

US Patent 3 701 449 discloses a crate with integral partitions extending upwards from a floor adapted to rest on the tops of bottles in a subjacent crate, so the subjacent bottles carry the weight of bottles above, but when handling a crate individually it must be sufficiently rigid in itself.

The invention provides a suitably rigid crate with relatively low material content.

According to the invention, there is provided a crate having a body with a cavity for receiving a plurality of containers and having a floor structure on which the containers can be supported; and a crate insert providing a spacer arrangement located in the cavity of the body and suitably above the floor of the body for separating containers in the crate from one another in normal use.

The spacer arrangement of the crate insert may be located in the upper half of the crate and may alone or together with the body provide openings for receiving containers. Where the openings are provided by both the body and the insert, the crate insert may border only part of any opening. However, where openings are provided completely by the spacer arrangement, the spacer arrangement may be designed to completely encircle the containers in those openings.

It will be appreciated that the crate may be particularly suited for receiving containers in the form of bottles.

If the crate body is made as a relatively thin-walled body of plastics material, the body may flex excessively if it alone is used for carrying containers. Partitions or webs provided in the lower part of the crate may not stabilize the body sufficiently in normal use. The spacer arrangement can be suitably rigid to restrain excessive flexing of the body when it is carrying full containers.. For this purpose, the crate insert may be shaped so that, where it extends from one wall of the crate to another, it is reinforced to provide the body with suitable support against flexing. For example, it may include concave or hollow sections, such as inverted V-shaped sections, strengthened by downwardly depending reinforcing webs.

The body and crate insert may be provided with complementary formations for enabling the crate insert to be secured to the body at various locations for further strengthening the crate.

The floor of the crate may be part of a base including suitable web formations for restraining sagging of the base.

If the crate is to be used for containers whose contents should be protected from excessive exposure to light, the crate may have a peripheral wall high enough to exclude most light from reaching the containers. In any event, it is not necessary for the walls to be sufficiently high to engage another full crate when the crates are stacked. In this regard, the crate may be provided with suitable carrier formations or a lower supporting surface for engaging and resting on the tops or necks of suitably rigid containers, such as bottles, in a subjacent crate. A relatively flat supporting surface can be used to allow the crate to slide more readily into place on containers in a subjacent crate while a plurality of formations may be used for bottles. Any flat surface may be in a recessed central area of the base of the crate with a peripheral border to limit undesirable sliding of the crate when supported on containers in a subjacent crate.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying schematic drawings, in which

Figure 1 is a very basic three-dimensional representation of a crate, including a crate insert, according to the invention, no detail being shown;

Figure 2 is a side elevation of the body of the crate of Figure 1 with the left hand side of the crate shown in cross-section;

Figure 3 is an end elevation of the body of the crate with the left hand side of the crate shown in cross-section;

Figure 4 is a plan and underplan view of the body with the left hand side showing a plan view of half of the crate and the right hand side showing an underplan view of half of the crate.

Figure 5 is a plan and underplan view of the crate insert with the left hand side being a plan view of half of the insert and the right hand side being an underplan view;

Figure 6 is a side elevation of the crate insert;

Figure 7 is an end elevation of the crate insert;

Figure 8 is a cross-section through part of the insert;

Figure 9 is a cross-sectional side elevation of the crate;

Figure 10 is a sectioned plan view showing the manner in which the crate and insert are located and secured at the end walls of the crate;

Figure 11 is a sectioned plan view showing the manner in which the crate and insert are located and secured at the side walls of the crate;

Figure 12 is a cross-sectional side elevation of an alternative base for a crate.

Referring to Figures 1 to 11 of the drawings in more detail, a bottle crate 10 comprises a one part moulded plastic body 12 and a one part moulded plastic crate insert 14.

The body 12 has a base 16 providing floor surfaces 18 for supporting bottles located in the

crate and substantially flat carrier surfaces 20 for resting on the tops of bottles in a subjacent crate of similar construction.

To provide the floor surfaces 18 and carrier surfaces 20, the base 16 is suitably shaped to provide lower base parts 16.1 containing openings 16.11 and on which the crate can stand when it is not supported on bottles in a lower crate, upper base parts 16.2 providing the floor surfaces 18, carrier surfaces 20, a web-bearing grid 16.3, and connecting strips 16.4 connecting the upper and lower base parts 16.1 and 16.2.

The connecting strips 16.4 themselves comprise peripheral strips 16.41 connecting the lower base parts 16.1 to a peripheral wall structure 24 of the body, inclined base strips 16.42 connecting the lower base parts to those upper base parts providing the floor and carrier surfaces 18 and 20 and forming inclined surfaces 16.43 allowing the crate to slide onto and off the tops of bottles in a subjacent crate, and more upright strips 16.44 connecting the lower base parts 16.1 to the web-bearing grid 16.3.

Because those upper base parts 16.2 providing the carrier surfaces 20 can be subjected to considerable forces, they are provided with integral strengthening cruciform formations 18.1.

The base is provided with webs 22 fixed on the web-supporting grid 16.3 and to the wall structure 24, which serve to restrain sagging of the base and also serve to separate the bottoms of bottles received in the crate.

The peripheral wall structure 24 encircles the base 16. The wall structure is formed by a peripheral wall 26 and upright hollow pillars 28. As shown in Figure 4, the peripheral wall is substantially rectangular in plan view and comprises end walls 26.1 and side walls 26.2 connected by rounded corners. The pillars 28 are moulded integrally with the walls 26.1 and 26.2 and serve to strengthen these walls. Each of the pillars has a cross-section which is approximately one half of an octagon, seen in plan view. The webs 22 extend from and are moulded integrally with the pillars.

Hand grip formations 30 which are suitably reinforced by a peripheral bead 30.1 and border openings 30.2 are provided by the end walls 26.1 and enable the crate to be lifted.

It will be seen that the body is thus a one-part moulded unit and it may be relatively thin-walled. However, as the walls of the crate area made primarily from a single layer of plastics material, the body may flex excessively when used to carry full bottles. It is therefore desirable to strengthen the crate. In addition, it is also desirable to make provision for keeping the upper parts of the bottles apart. For these purposes, the crate insert 14 is used.

The body 12 is provided with locating formations 32 at the upper part of the pillars 28. Each of these locating formations 32 is provided by forming a vertically extending slot 32.1 in and at the centre of that part of the respective pillar 28 furthest from the wall 26. This creates two inwardly directed flanges 34 on opposite sides of the slot 32.1 as shown in Figures 10 and 11. Where the pillars 28 on the end walls 26.1 border the openings 30.2, the pillars are partly omitted, as shown in Figure 3, so that the slots 32.1 and the flange 34 beneath the opening are relatively short.

The crate insert 14, which provides a spacer arrangement 14.1 and is designed to be located in the cavity of the body as shown in Figure 1, has complementary formations 40 and 42 for engaging formations 32 on the side walls and end walls, respectively, to locate and releasably secure the crate insert with respect of the body. Those formations 40 which engage the formations 32 on the side walls 26.1 are hollow upright formations extending upwardly from the spacer arrangement 14.1 of the insert and are designed to fit around the pillars 28 on the side walls. Those formations 42 which are intended to engage the formations 32 on the end walls 26.1 are formed as hollow uprights at opposite sides of a respective hand grip 45 and hand grip opening 45.1 at each end of the crate insert. The opening 45.1 in each hand grip 45 is arranged, in use, to correspond with the opening 30.2 of a respective hand grip 30 of the crate, as shown in Figure 1.

As shown in Figures 5 and 10, the formations 42 each have a central web 42.1 which extends towards the end wall 26.1 and which has a projecting part 30.21 shaped to snap into the opening 30.2 at opposite sides of the opening, as shown. This means that when the insert is pushed into place, the extension of the web into the opening inhibits removal of the insert. The webs 42.1 are each provided with a locating lip 42.2 projecting away from the opening 45.1 in the insert. Each web 42.1 is located to fit into the slot 32.1 in the respective pillar 28 and each lip 42.2 is shaped and located to fit into and close to the inner surface of a respective flange 34 to locate and secure the formations 42.

To connect the insert to the side walls, the formations 40 are provided with internal T-shaped formations 40.1 each comprising a web 40.2 and cross bar 40.3, as shown in Figure 11. The T-shaped formations engage respective formations 32 at the upper parts of pillars 28 with the webs 40.2 received in slots 30.1 and bars 40.3 received within the pillars 28 and against the inner surfaces of flanges 34 as shown in Figure 11. This locates and secures the formations 40.

As shown in Figures 1, 6 and 9, the upper part

of each formation 40 and 42 has an inclined part 36 which covers and closes the top of the respective pillar when the insert is in place. At the top of each part 36 of the formations 40, the formations are each provided with a notch 38.1. The walls 26.1 are provided with lugs 38.2 which are located to fit into the notches 38.1 and the formations 40 and notches 38.1 are fitted into place and engage the lugs 38.2 by a snap fit action. The engagement between the formations and lugs also serves to retain the insert in the crate body.

The spacer arrangement 14.1 of the crate is located in the upper part of the cavity provided by the crate body and is therefore suitably above the floor of the body for keeping the upper parts of bottles in the crate separated from one another. In this regard, it will be seen that at the corners of the crate, the crate insert and the walls of the body jointly define openings into which bottles can fit. Elsewhere, the crate insert has circular openings 44 for receiving and encircling bottles.

In order to provide the crate insert with suitable strength for supporting the body against excessive flexing, the insert is provided throughout a substantial part of its structure, with an inverted generally concave V-shaped cross-section having strengthening webs 46 shown in the detailed section of Figure 8. As the crate insert securely engages the formations 32 and also rests on the pillars 28, suitable construction of the crate insert can provide the crate with considerable rigidity. This is achieved without the need for conventional partitions moulded with the body and which can use up considerably more material.

The crate shown in the drawing is particularly suitable for use as a beer crate and has walls which are intended to extend up almost the full height of bottles in the crate, but to leave a small gap between crates when full crates are stacked one on top of another. In this way, the surfaces 20 of one crate will rest on the tops of bottles in a subjacent crate. The fact that the surfaces 20 are provided in recessed areas will help to stop crates sliding about. The peripheral wall, however, will be sufficiently high to exclude most of the light from reaching the bottles in the crates.

In the crate of Figure 12, the body 12 and the insert 14 (not shown) are similar to those of Figures 1 to 11. However, the body 12 has a base 116 providing floor surfaces 118 for supporting bottles located in the crate and a substantially flat carrier surface 120 for resting on the tops of bottles in a subjacent crate of similar construction. The floor 118 and surface 120 are provided by the major part of a recessed central area of t base which is readily visible in Figure 12. The central area is surrounded by a peripheral border 116.1 which has an inclined wall 116.2 extending away from the surface 120. The inclined wall 116.2 and surface 120 allow the crate to slide onto and off the tops of bottles in a subjacent crate.

The base is again provided with webs 122 which serve to restrain sagging of the base and also serve to separate the bottoms of bottles receive in the crate.

Although the crate of Figure 12 is shown with a closed base, which can have certain advantages, the base may be provided with drainage holes in the peripheral border 116.1.

Crate bodies of a particular size and shape can be used with a range of inserts so that different bottles or other containers can be transported. The flat surface 120, for resting on various containers, can help make this possible. Although the webs in the specific crate shown may not be suitable for use with a wide range of containers, it is simple to make a crate with the webs replaced by any suitable reinforcing arrangement for wider use.

If it is desirable for crates to rest on one another, the formations 40 and 42 of the insert may be shaped and formed as extensions of the pillars 28 so that the pillars and extensions of stacked crates rest on one another and form support columns for the stacked crates.

Claims

1. A crate having a body with a cavity for receiving a plurality of containers and having a floor structure on which the containers can be supported; characterised by a crate insert (14) providing a spacer arrangement (14.1) located in the cavity of the body and suitably above the floor (16) of the body for separating containers in the crate from one another in normal use.

2. A crate according to claim 1, characterised in that the spacer arrangement (14.1) of the crate insert (14) is located in the upper half of the crate and alone and/or together with the body (12) provides openings (44) for receiving containers.

3. A crate according to claim 1 or 2, characterised in that the crate body (12) is made as a relatively thin-walled body of plastics material and the crate insert (14) is reinforced (46) for providing the body with support against flexing.

4. A crate according to claim 3, characterised in that the crate insert (14) includes concave or hollow sections (Figure 8) reinforced by reinforcing webs (46).

5. A crate according to any preceding claim, characterised in that the body (12) and crate insert (14) are provided with complementary formations (32, 40, 42) for enabling the crate insert to be secured to the body at various locations for locating the insert and further strengthening the crate.

6. A crate according to any preceding claim, characterised by carrier means (20, 120) for engaging and resting on the tops or necks of containers in a subjacent crate.

7. A crate according to claim 6, characterised in that the carrier means comprises a carrier surface (120) in the form of a substantially flat supporting surface in a recessed central area of a base of the crate with a peripheral border (116.1) to limit undesirable sliding of the crate when supported on containers in a subjacent crate.

8. A crate according to claim 6, characterised in that the carrier means includes a plurality of carrier surfaces (20) each with a peripheral border (16.43) to limit undesirable sliding of the crate when supported on containers in a subjacent crate.

9. A crate according to any preceding claim, characterised by means (38.1, 38.2) for retaining the insert in the body.

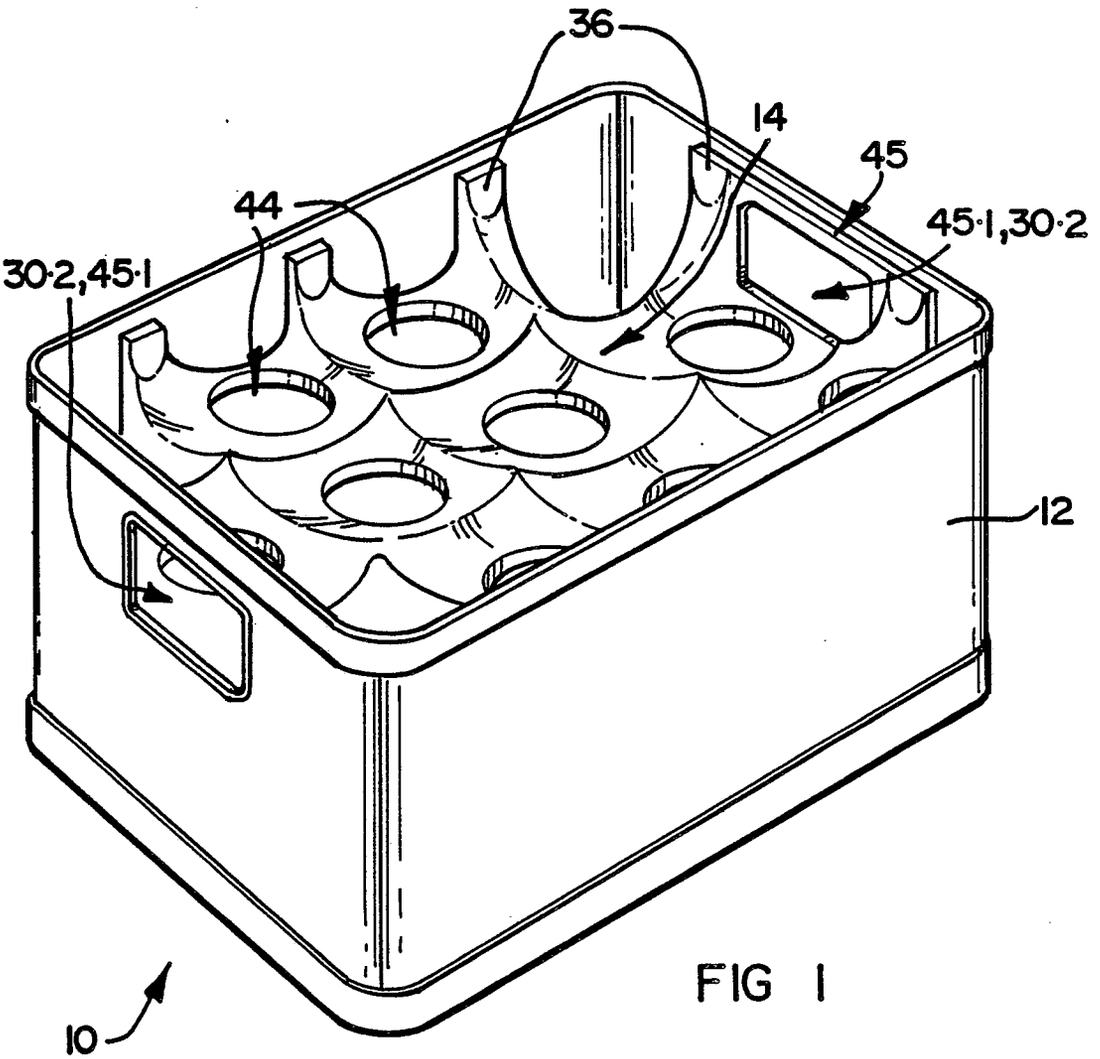

FIG 1

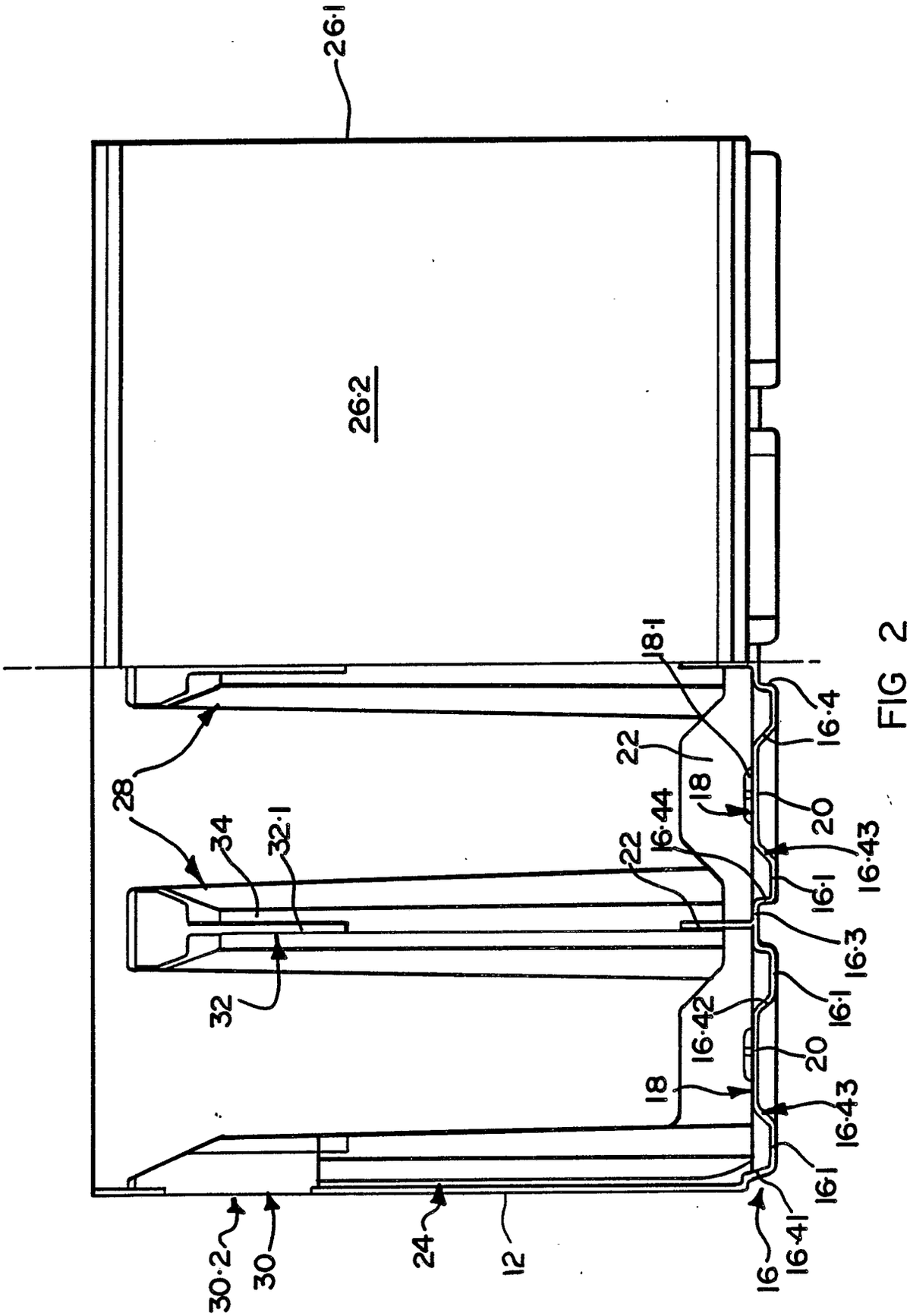
26·1
26·2
28
34
32·1
32
30·2
30
24
12
18·1
22
18
16·44
22
18
16·42
18
16
16·41
16·4
20
16·43
16·1
16·3
16·1
20
16·43
16·1

FIG 2

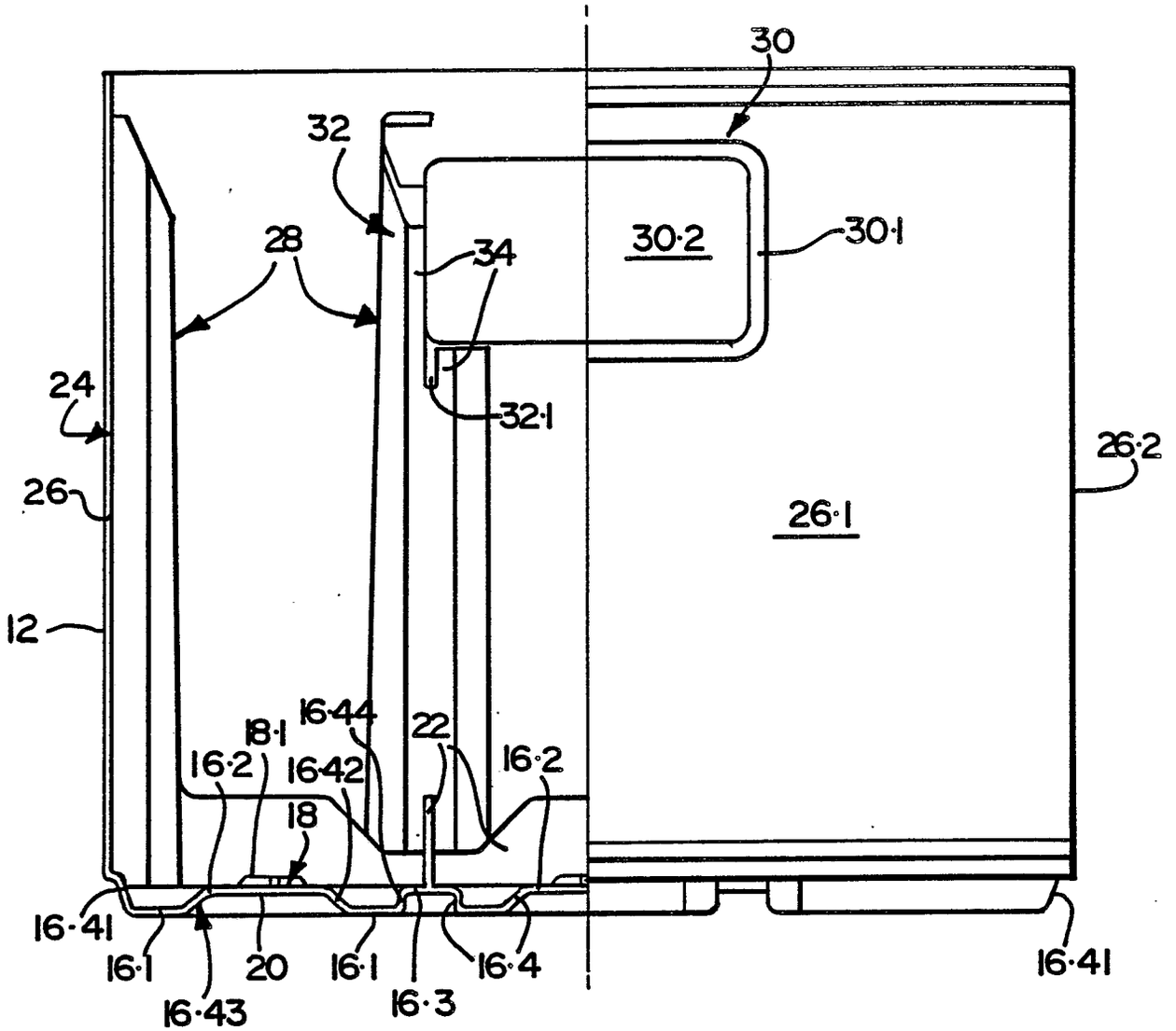
30
32
28
34
30·2
30·1
24
32·1
26·2
26
26·1
12
16·44
18·1
22
16·2
16·42
16·2
18
16·41
16·1
20
16·1
16·4
16·41
16·43
16·3

FIG 3

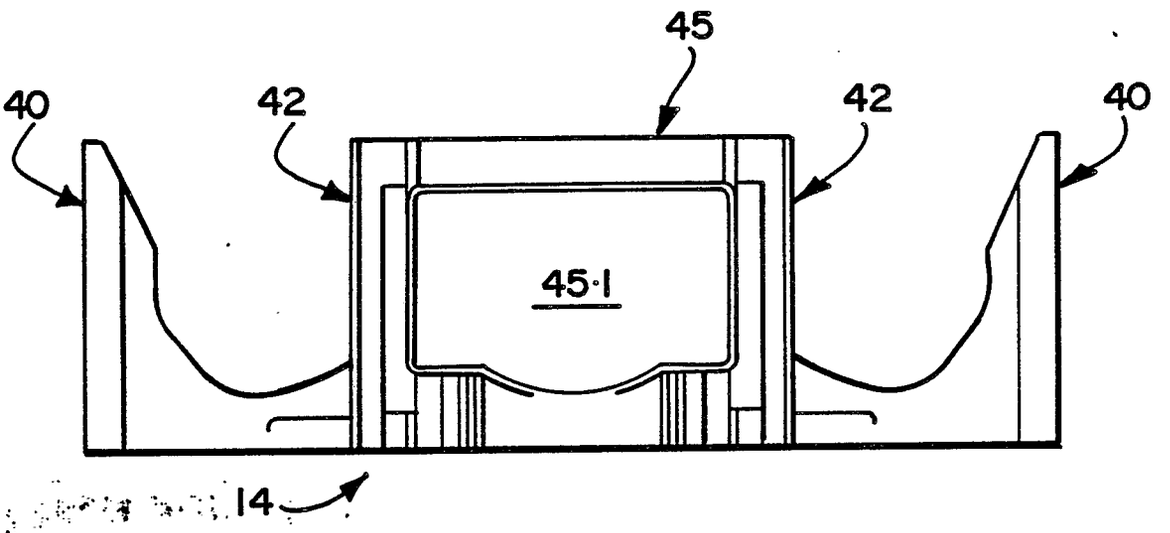
45
40
42
42
40
45·1
14

FIG 7

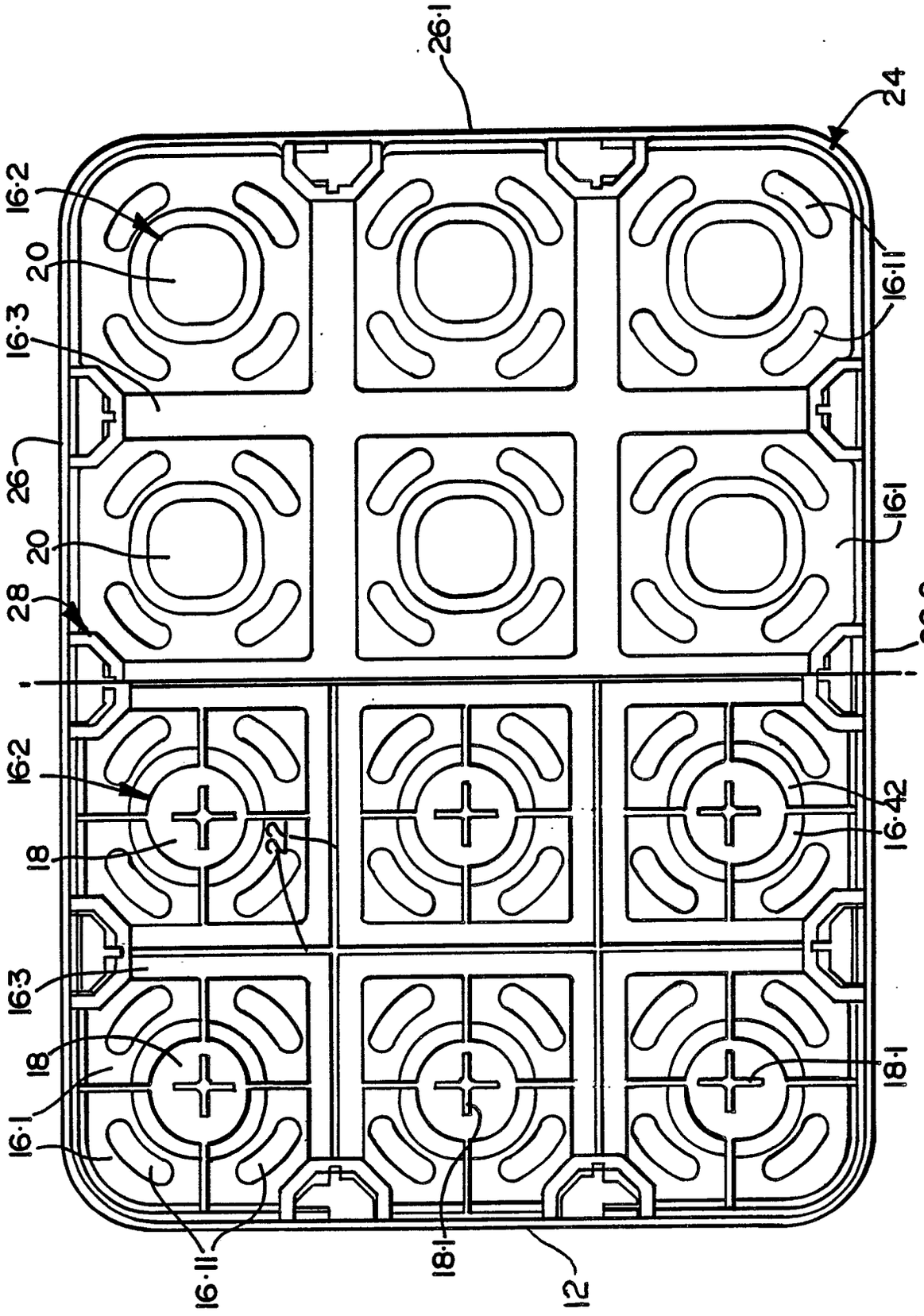
26·1
24
16·2
20
16·3
26
20
28
16·2
18
16·3
18
16·1
16·11
16·11
18·1
12
16·11
16·1
16·42
18·1
26·2

FIG 4

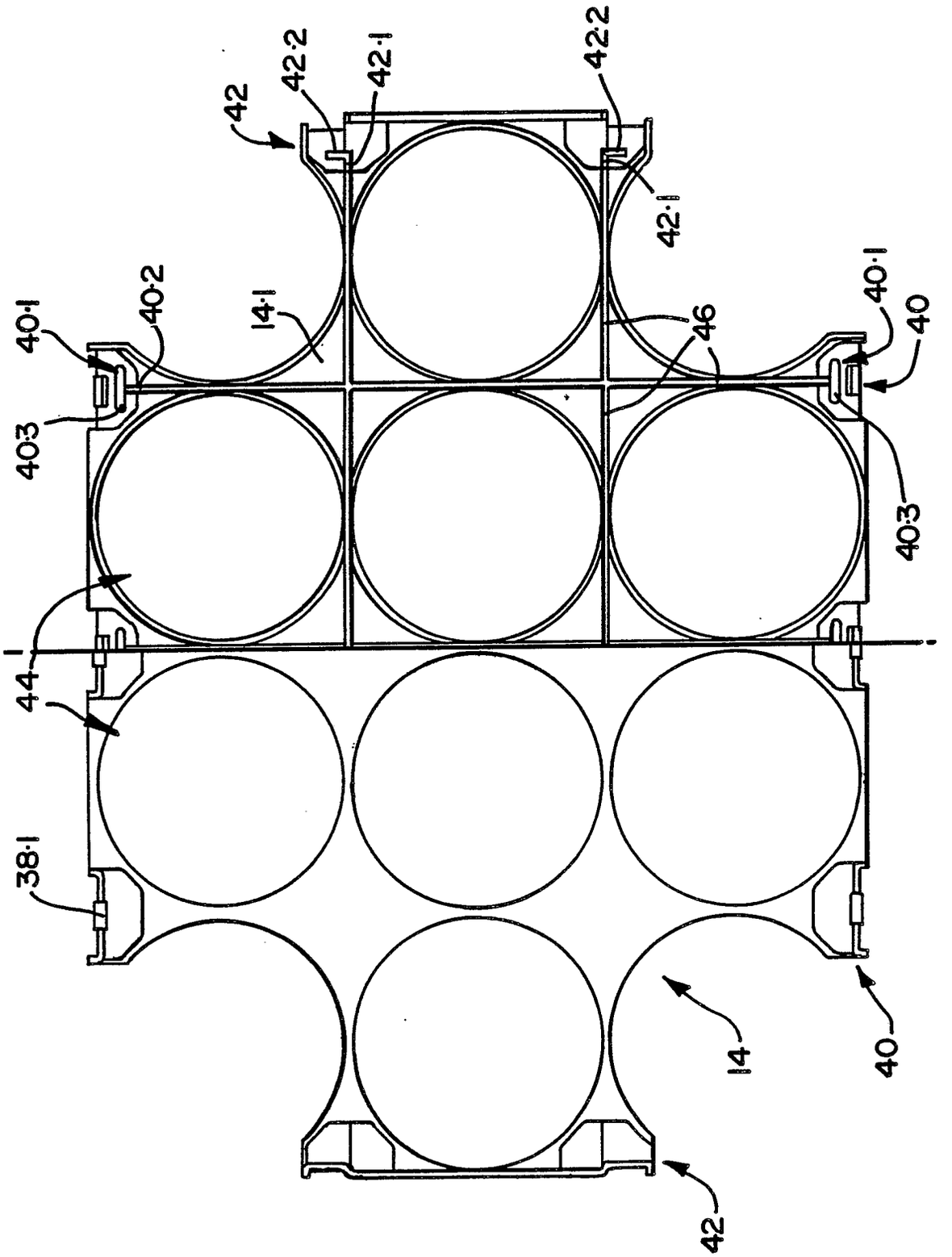

FIG 5

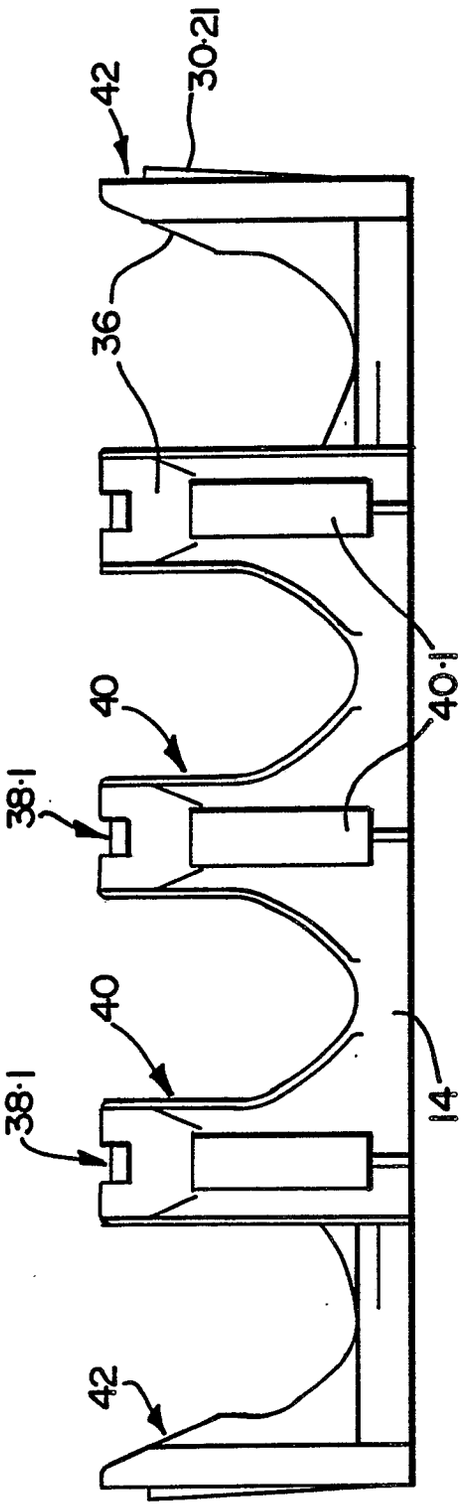

FIG 6

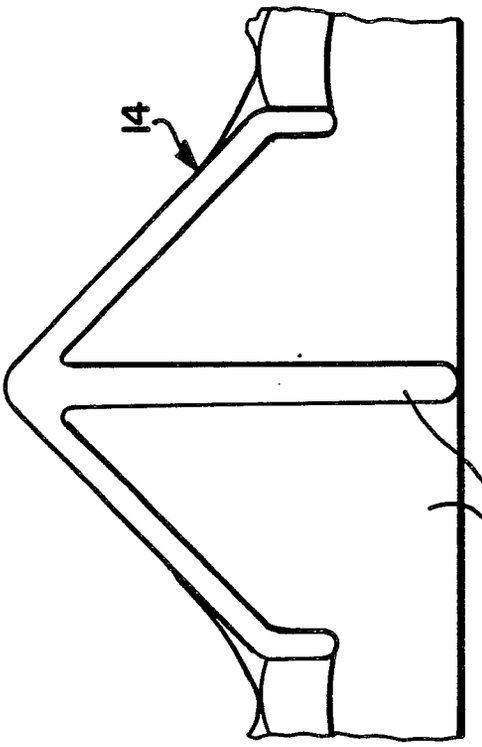

FIG 8

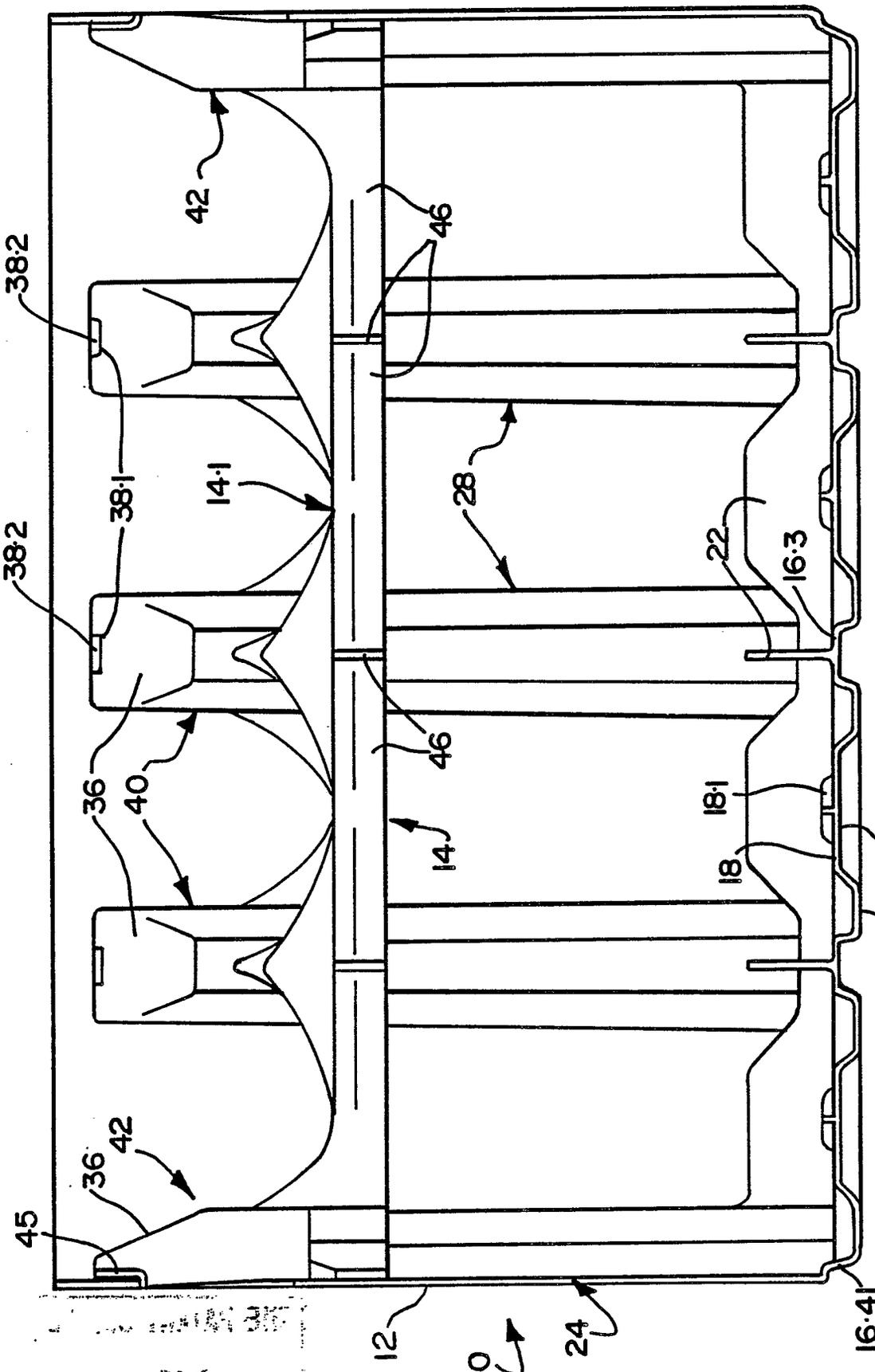
42
46
38·2
38·1
14·1
28
22
16·3
38·2
36
40
46
18·1
14
18
20
16·42
16·1
36
42
45
12
10
24
16·41

FIG 9

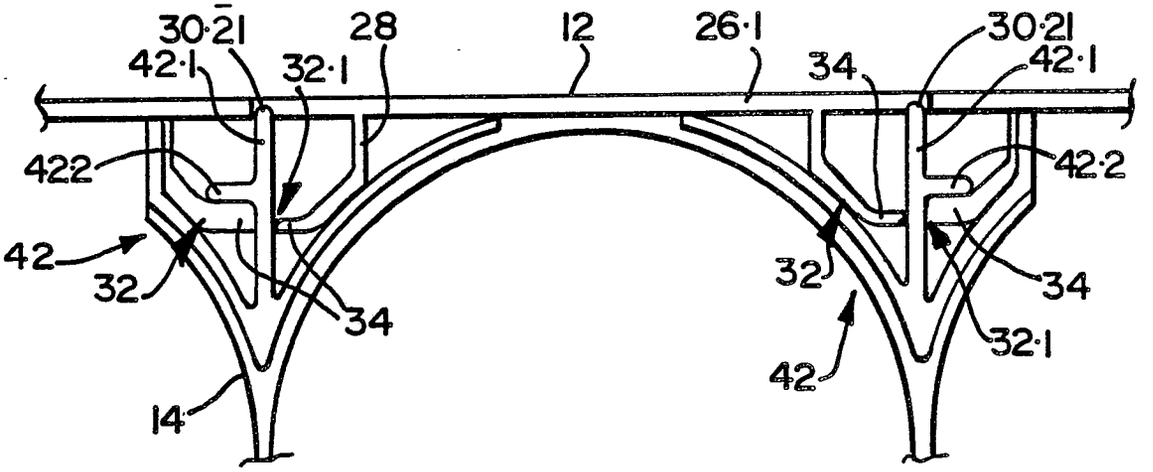

FIG 10

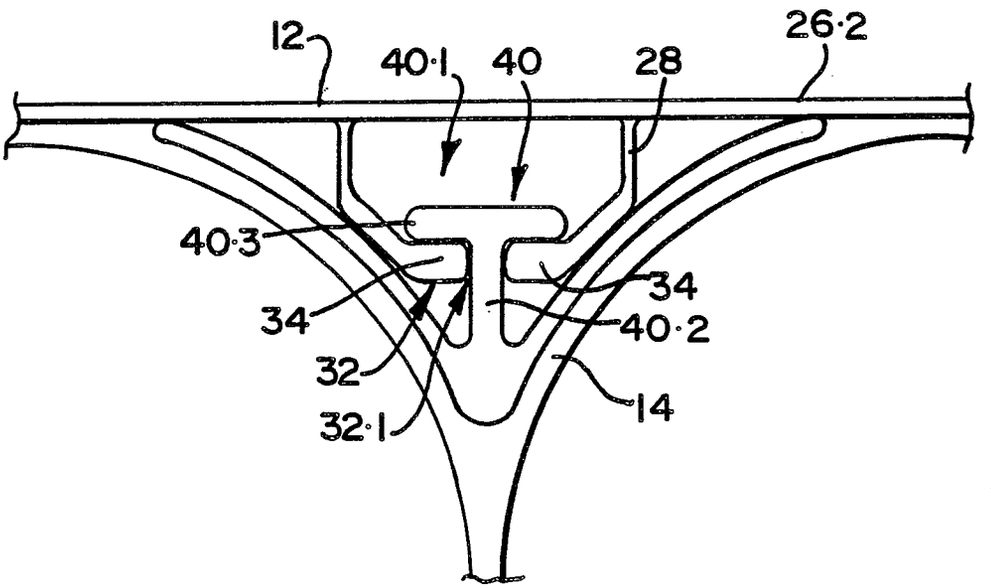

FIG 11

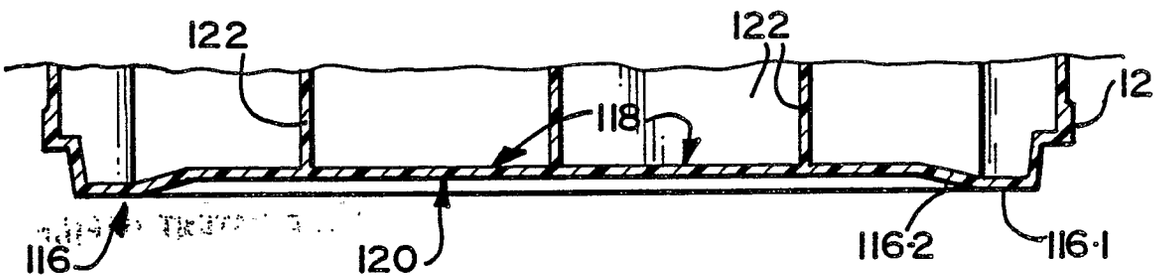

FIG 12