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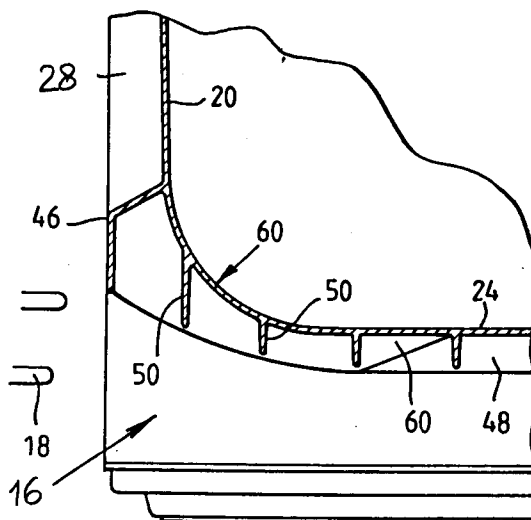
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London EC4Y 0JJ(GB)(54) **Box pallet.**

(57) A bulk container of the kind used in storage of materials is shown which is normally transported from location to location by a fork lift truck. The container comprises sidewalls and a base. There are a pair of recesses in the lower portion of the container below the base which are capable of receiving the "tines" of a fork. Ribs are provided on the underside of the container running in the direction of the recesses. Internally the base of the container is connected to the side walls with a large radius. The ribs extend along the underside of such portions, having their lower edges on an arc of still larger radius.

Fig.4**EP 0 479 073 A2**

BACKGROUND TO THE INVENTION

The invention is concerned with a bulk container of the kind used in storage of materials which container is normally transported from location to location by a fork lift truck and which comprises sidewalls and a base, with a recess or opening in its lower portion below the base, said recess or opening being capable of receiving the "tines" of a fork. Such a bulk container is hereinafter called a "container of the kind set forth".

US Patent No 4,375,265 (van de Wetering) discloses a container of the kind set forth comprising foamed plastic. On the underside of and covering the area of the container are ribs running parallel to the sides, the outmost of which ribs form in effect continuations of the vertical walls of the container. The base of the container is flat and is connected to such walls by very small radiused corners. Short stiffeners are provided for the ribs. At the entrance to the recesses, there are two such stiffeners that run in the direction of the recesses and extend both inwardly and outwardly to the end of horizontal outwardly extending ribs that re-inforce the outside of the container. The forward ends of these stiffeners are tapered in an attempt to ensure that the entering ends of the forks do not engage the transverse ribs to cause the container to be moved but instead slide underneath the ribs. The taper may be at thirty-five to forty five degrees.

While the tapered front ends of the stiffeners serve to enlarge the entrance to the recess, the enlargement is perforce no greater than the height of the stiffeners and furthermore the incline of the taper is such that there is a very significant probability that the tines will engage the stiffeners fairly flat on and damaging them. Thus the effect of these stiffeners is limited.

SHORT DESCRIPTION OF THE INVENTION.

According to one aspect of the invention there is provided a container of the kind set forth having ribs on its underside running in the direction of the recesses characterised in that that base of the container has edge portions that slope up to the side walls, preferably by being of enlarged radius, and that ribs extend along the underside of such portions. The height of the ribs may increase along such portion towards the ends of such portions and preferably extend beyond the side walls to provide an enlarged opening for the recesses. This enlarged opening may extend higher than the height of the base of the container and the decrease in height can be smooth to enable the minimise the possibility of there being a butting engagement of

the ends of the tines with edges of the ribs.

An embodiment of the invention will now be described by way of example with reference to the accompanying drawings.

In the drawings:-

Figure 1 is a perspective view of a bulk container of the invention,

Figures 2 and 3 are respectively sections on lines 2 - 2 and 3 - 3 of Figure 1,

Figure 4 is a section on lines 4 - 4 and 3 - 3 of Figure 1,

Figure 5 is a complex view being one half being a plan and the other half being an underplan of the container, and

Figure 6 is an end elevation of a foot used in the container,

Referring now to the drawings, there is shown a one piece moulded polyethylene bulk container 10 for use for example by farmers and others who store farm produce such as apples. The container 10 comprises a containment space 12 mounted on three legs 14a, 14b and 14c that extend from front to rear of the container and leave two spaces or recess 16 therebelow for the insertion of the tines of a fork lift truck (shewn schematically at 18 in Figure 4).

The containment space 12 is defined by front and rear walls 20, side walls 22 (all of which are hereinafter referred to as the "containment walls") and a base 24.

The containment walls are reinforced by vertical corner members 26 and centre members 28. These centre and corner members are constituted by an outer and joining walls 30 and 32. The outer walls 30 run parallel to and spaced (by about 40mm) from the containment walls (as is best shown in Figure 3). These walls 30 run downwardly and merge into the outer walls 34 of the outer legs 14a and 14c. An internal corner or gusset 36 is provided at the vertical corners of the containment walls.

Four spaced, outwardly directed, horizontal flanges 38 are provided at the upper edges of the containment walls extending between the centre and corner members 28 and 26. Between the two uppermost flanges 38, the containment walls are outwardly inclined as indicated at 40.

Between the corner and centre members 26 and 28, the containment walls are perforated at 42 to provide ventilation for the containment space. An outwardly and downwardly inclined wall 44 extends from the lower end of each of the side walls 22 slightly above the base 24 between members 26 and 28 and this inclined wall 44 merges with the outer wall 34 of the outer legs 14a and 14c.

The front and rear walls 20 are generally similar to the side walls 22 but are somewhat less wide. At their lower edges there are horizontal

flange members 46 having outer faces which connect and merge with the outer faces of the corner and centre members at these walls 20.

The underside of the base 24 is re-inforced by vertical longitudinal re-inforcing ribs 48, that run parallel to the feet 14, and transverse ribs 40. The ribs taper slightly to facilitate demoulding of the container. They are typically of 4mm width at their lower end and about 34 mm high.

Two inner walls 52 for the outer feet 14a and 14c are provided and there are centre walls 54 of lesser length and depth than walls 52 are provided respectively between the walls 34 and 52 of the outer feet. Two inner feet defining walls 56, merging with the joining walls 32 of the centre members of each of the front and rear walls, extend from the base 24 and there is a centre wall 57 (similar to centre walls 54) midway therebetween.

Longitudinal slots 58 are provided between the ribs 48 to permit air flow to the contents of the container.

The base 20 has edge portions 36 of enlarged radius corner connections 60 and 62 respectively with the front and rear walls 20 and the side walls 22. Conveniently such radius is of the order of 60mm (slightly more than two and a quarter inches) at the side walls (indicated at 62) and 125mm (just under five inches) at the front walls (indicated at 60). Below the radius connection to the front and rear walls, the longitudinal ribs 48 are supplemented by intermediate re-inforcing ribs 64 located midway therealong to create an integral slide entry. The longitudinal ribs 48 and 60 run around the underside of the corner connections 60 at the recesses 16. The lower edges of the ribs 48 and 64 lie on an arc that is centred on a point spaced above and inwardly of the centre of the radius 60 at the front walls and that has a larger radius than the radius of the such portion. They extend beyond the front and rear walls 20 to the front of the outer faces of the corner and centre members at these walls 20. Typically the radius of the edges of the ribs 48 and 64 is 330mm (just under twelve inches). Thus the height of the ribs off the ground increases outwardly of the container 10. In the particular embodiment mentioned, the opening height of the recess i.e. the height of the ribs 32 above the ground (or as will often occur in practice, the height of such ribs above the upper edge of another container on which the container is stacked) is increased from 122mm (four point eight inches) to 185mm (slightly more than seven and a quarter inches). At the front of the recess, the tangent to the undersides of the ribs 48 and 64 are sloped at about 35° (thirty five degrees) to the horizontal and this slope decreases as these upper-sides eventually become horizontal about 194mm (one hundred and ninety four millimetres) (slightly

more than 7½ inches) from the entry to the recess 16. At its uppermost position, the opening at the recess 16 is located about 65 to 75mm (two and half to three inches) above the height of the base 24 of the containment 12.

At the portion of the base below the radius, the transverse ribs 50 are of smaller depth than the longitudinal ribs 48 and 64 so as to not to form a possible obstacle to the tines 18 of the fork lift truck.

This increased height and the smoothly sloping and mostly very shallowly inclined underside of the ribs 48 and 64 provides a significantly improved opening and guide for the tines 18 into the recess which considerably simplifies the task of the fork lift truck operator and to reduce damage to the underside of the container 10. Furthermore the shallowly inclined underside of the ribs enables the tines more easily to lift the container as the tines move deeper into the recesses 16 (if the tines do engage the ribs 48 and 64).

Furthermore it would be noted that because of the large internal radius, the taller ribs are provided and as the container is intended to contain agricultural and like products which are generally spherical such as apples, the volume of the containment space will not be reduced significantly or at all from a practical point of view.

It will also be noted that there are no re-inforcing means between the horizontal flanges 30. Thus the upper portions of the walls will be rather flexible and will be able to accomodate a fair amount of movement should the ends of the tines of a fork lift truck strike them.

The ribs 48 are placed at about 47mm centres and the ribs 48 and 64 are at 24,5mm centres. There are a large number of longitudinal ribs 48 and 64 at each recess, being conveniently fourteen such ribs at each recess 16 thus providing a substantial amount of material to engage the tines 18 if necessary. Thus a robust integral slide entry is provided.

The legs 14 of the container 10 contain channel section feet 66 (see Figures 2 and 6). These feet 66 have vertical side walls 68 that fit closely within the side walls 34 and 52 of the outer legs and and 56 of the centre leg. The walls 68 are provided with low horizontal ribs 70 to prevent the feet 66 slipping too deeply into the legs 14. There are internal transverse walls 72 along the midsection of the feet 66 and these walls 72 each have a vertical slot to receive therein the centre walls 54 or 57. In addition the side walls 68 are provided with protrusion members 74 that project through windows 76 formed in the sides and ends of legs 14 to prevent the feet 66 from being withdrawn. In addition, non-slip pads 78 are conveniently inserted into the base of each foot 66.

The invention is not limited to the precise constructional details hereinbefore described and illustrated and modifications thereto can be made within the spirit and scope of the following claims. For example the various dimensions mentioned above may vary as required. The shape of the container may be altered. The ventilation slots may be omitted from the base and or some or all of the sides of the container.

The container can be put to other uses and may be used to contain fish, engineering or other products.

Claims

1. A bulk container of the kind used in storage of materials, which container (10) is normally transported from location to location by a fork lift truck and which comprises containment walls (20, 22) and a base (24), with a recess or opening (16) in its lower portion below the base (24), which recess or opening is capable of receiving the "tines" of a fork, there being ribs (48, 64) on the underside of the container (10) running in the direction of the recesses characterised in that that base (24) of the container has edge portions (60) that slope up to the containment walls, and that the ribs (48, 60) extend along the underside of such portions.
2. A container as claimed in claim 1 characterised in that the edge portions are of enlarged radius.
3. A container as claimed in claim 1 or claim 2 characterised in that the height of the ribs (48, 64) increases along such portions towards the ends of such portions.
4. A container as claimed in claim 1, 2 or 3 characterised in that the ribs (48, 64) extend beyond the walls (20).
5. A container as claimed in any one of the preceding claims characterised in that the mouth of the opening extends higher than the height of the base (24) of the container.
6. A bulk carrier as claimed in any one of the preceding claims characterised in that wherein the upper edges of the ribs lie upon an arc centred on a line parallel to the side wall (20).
7. A container as claimed in claim 6 characterised in that the radius of the said arc on which the said lower edges of the ribs (48, 64) lie is substantially greater than the radius of

the edge portions (60).

8. A container as claimed in any one of the preceding claims characterised in that the upper portions of the sidewalls are capable of flexing inwardly in the event that they are engaged by the ends of a tine.

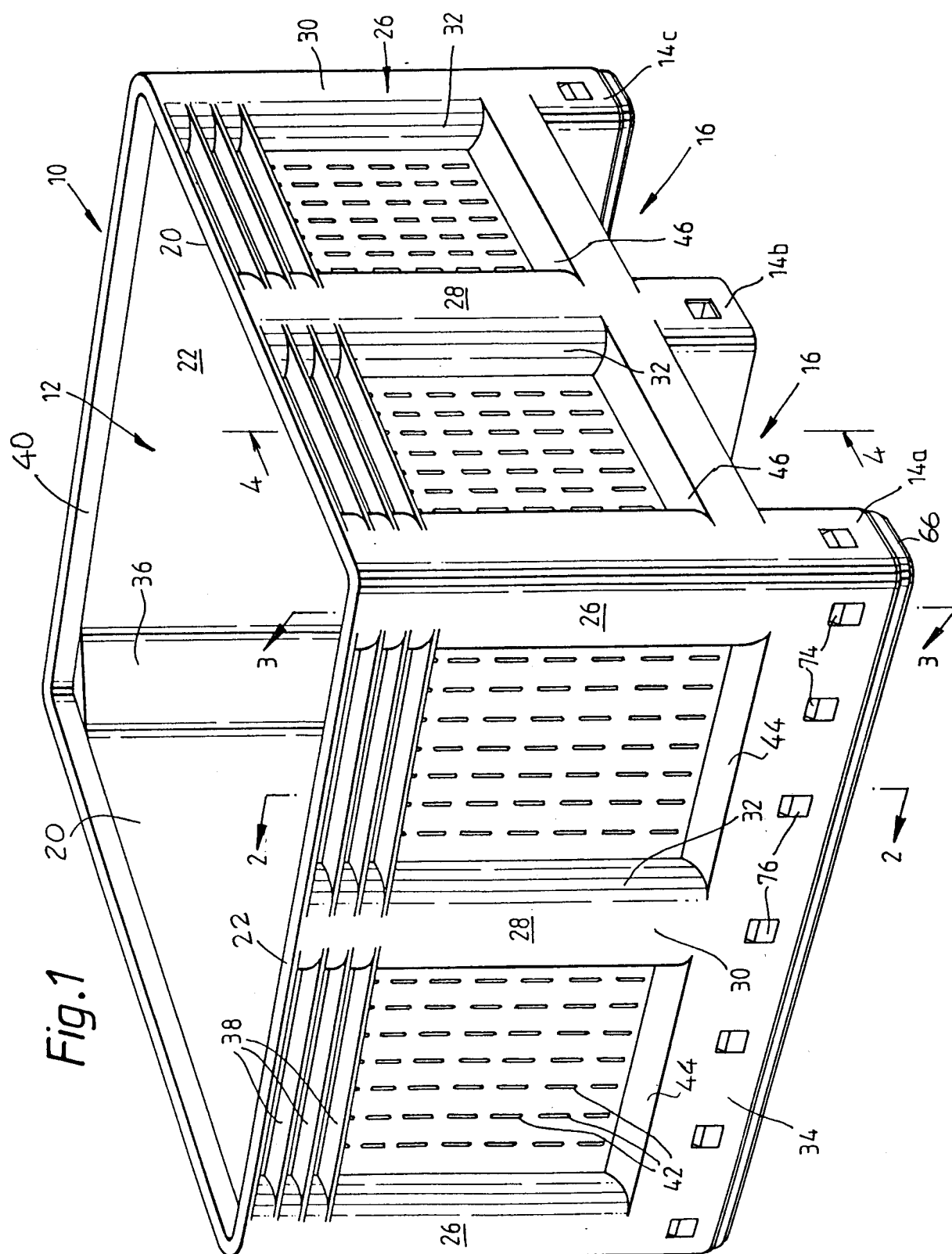
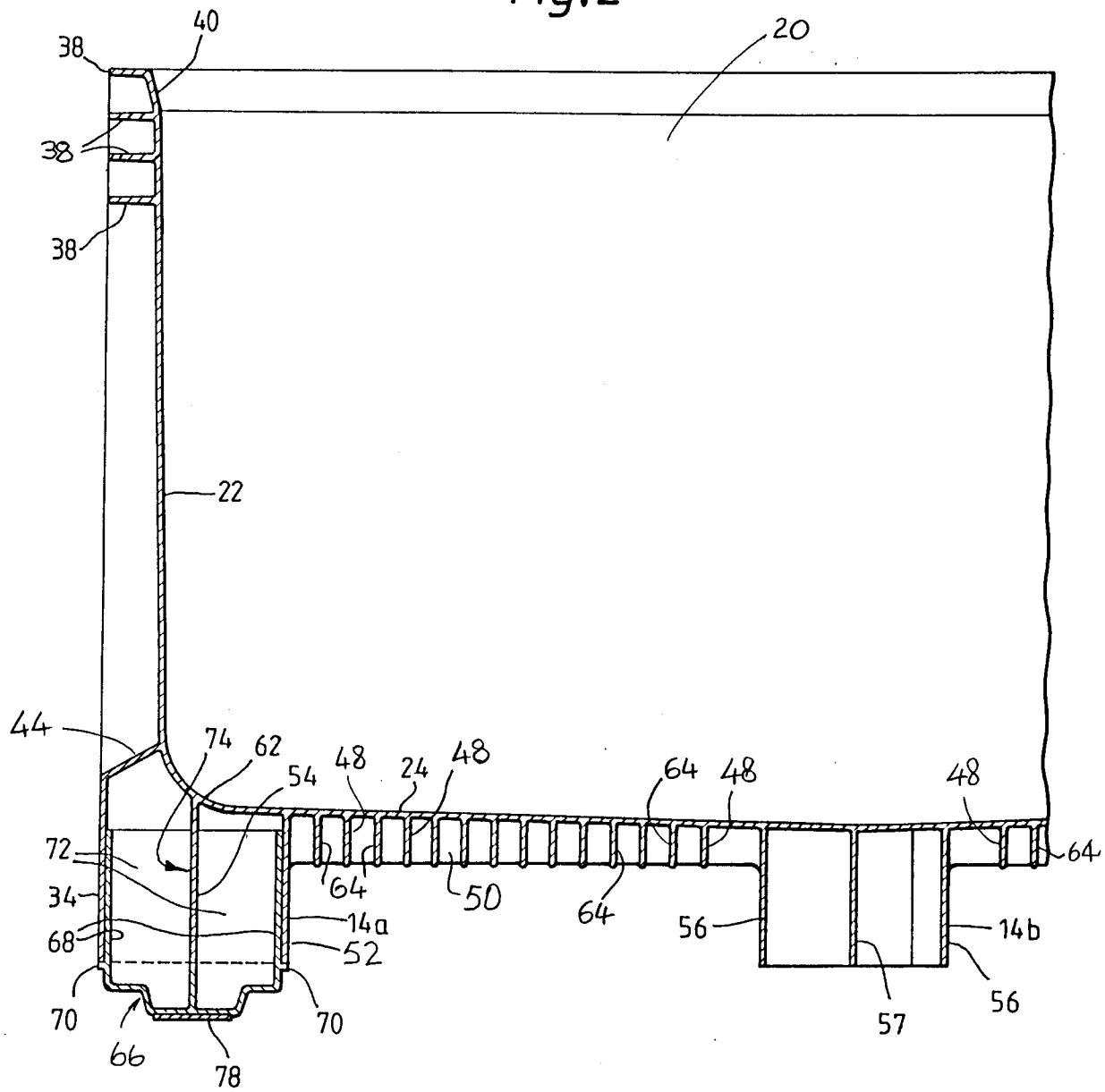


Fig. 2



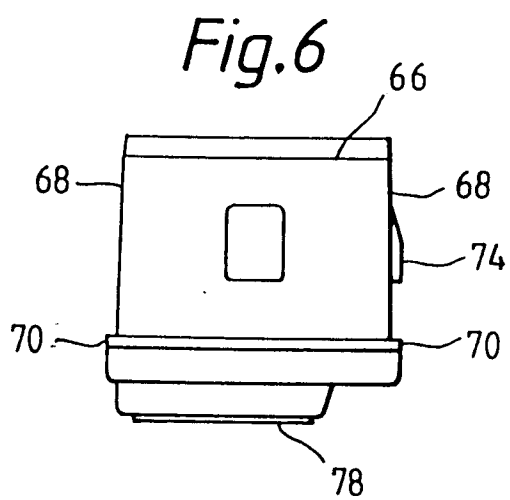
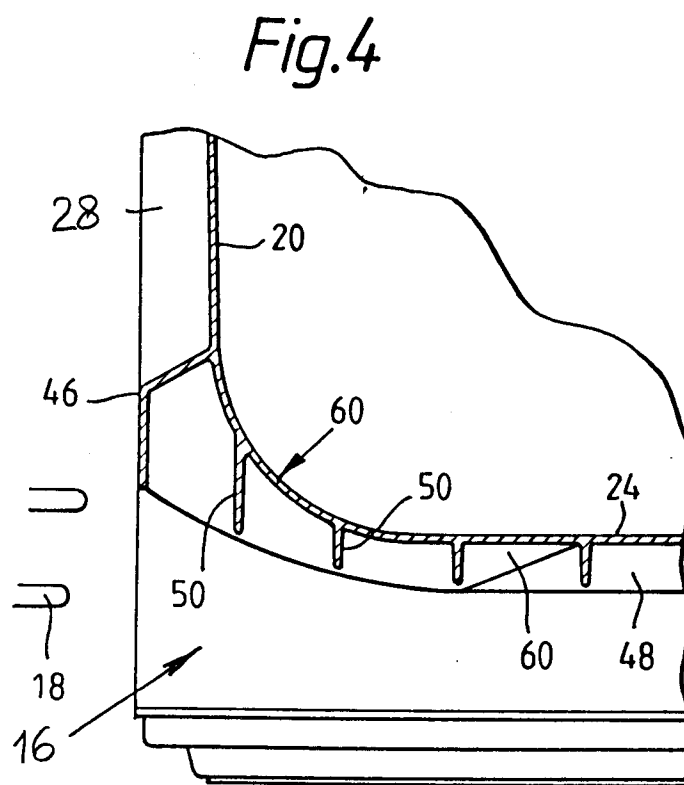
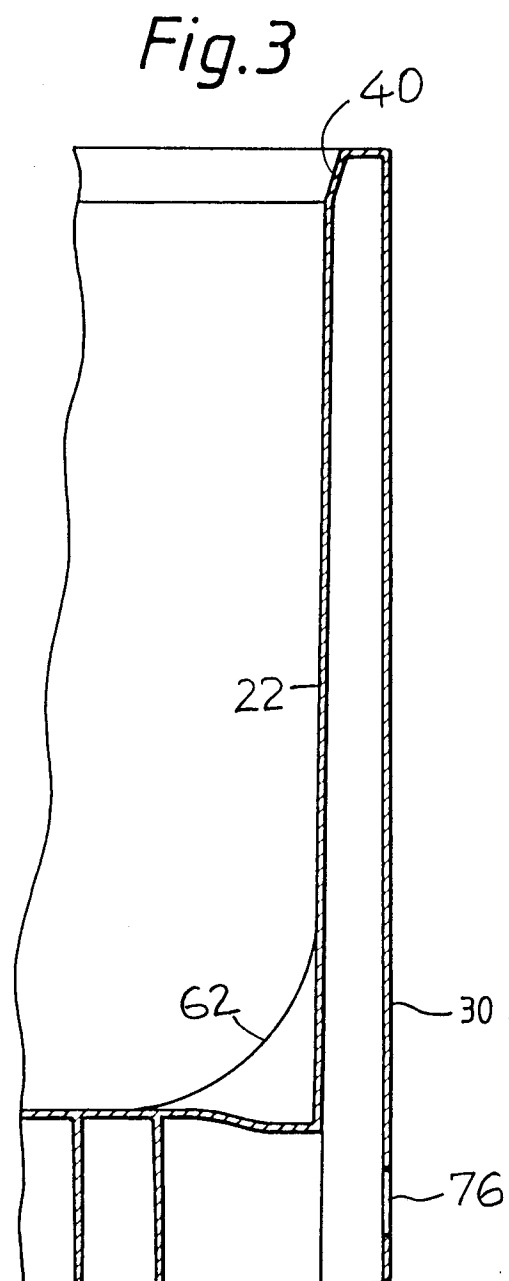


Fig.5

