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(54) **Device for packing, storage, transportation and supply of pulverulent products**

(57) Specially provided for paint in powder form, for example with an approximate capacity of 500 kg. it is constituted by a container body (21), with its corresponding lid, said body having a top frusto-pyramidal section (21), appreciably convergent in descending direction, which, after an intermediate neck (31) is finished off in a lower pyramidal section (23) with rounded vertex (24), in such a manner, that the product housed inside tends to move towards said vertex (24) to facilitate the

total emptying of the same, said displacement being increased with the cooperation of a vibrator, couplable to a side bolt (33) of the body. In order to offer stability to said body (21), it is complemented with a physically independent bedplate (29), also with frusto-pyramidal shape, inside of which the frame (31) is coupled, remaining thus stabilized. Both bodies (21) and bedplates (29) of different containers are couplable in order to minimize the occupation of space when laid-up when empty.

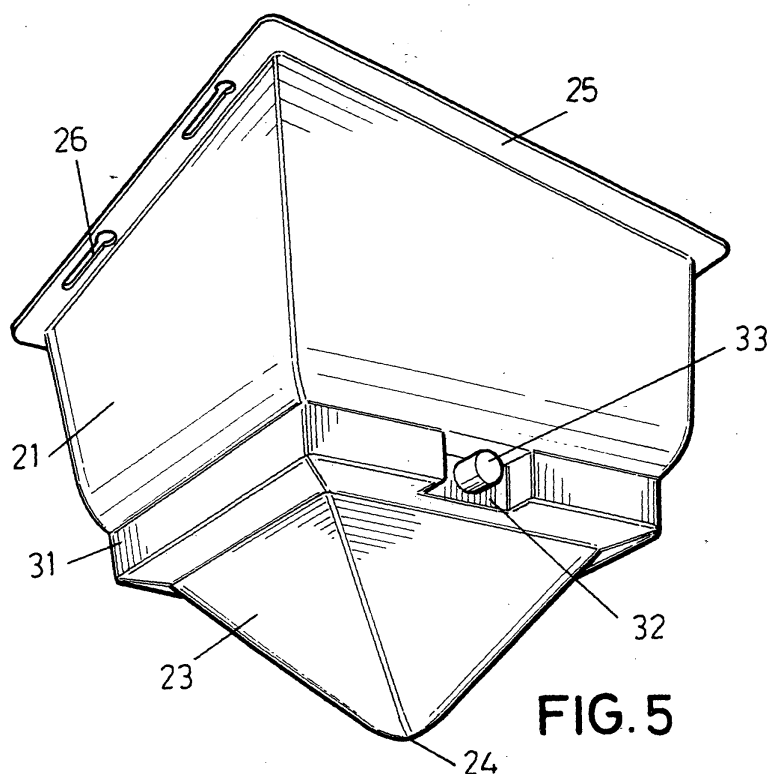
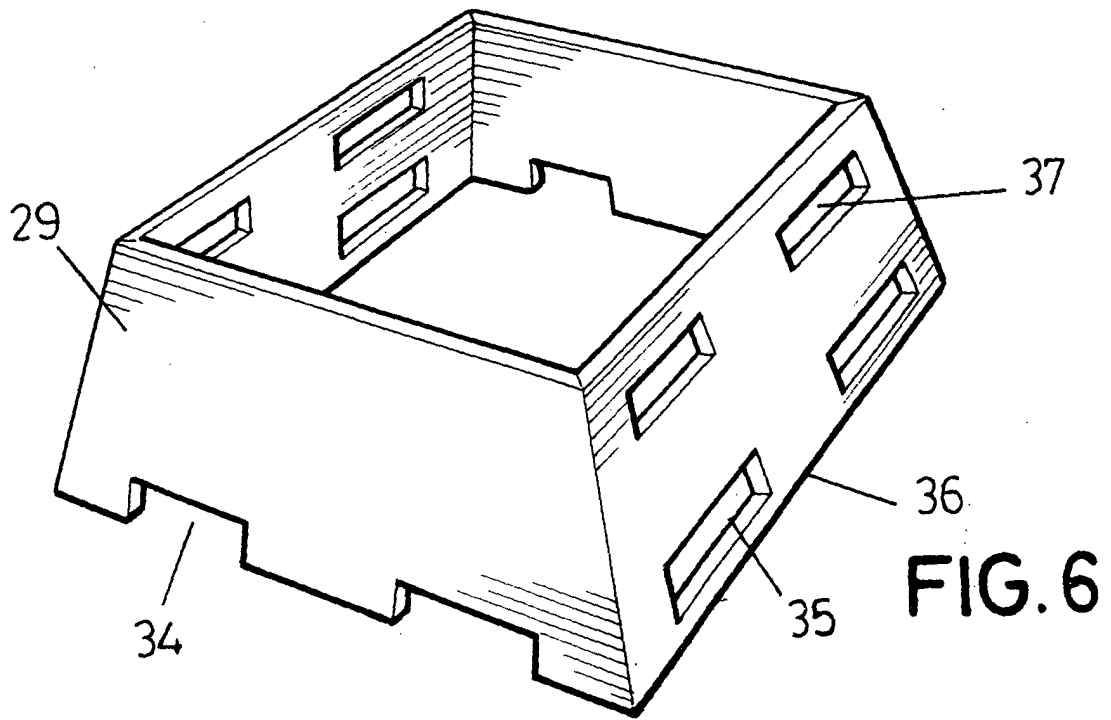


FIG. 5

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Description

OBJECT OF THE INVENTION

[0001] The present invention refers to a device that has been specially conceived as a means of packing, storing, transportation and supplying pulverulent products in flake, gamene or similar presentations, preferably for product areas such as paints, varnishes, enamels, dyes, etc.

[0002] The object of the invention is to obtain a device which, after the packing of the product, permits its easy storage and transportation and optimum emptying conditions during the consumption of its contents as well as the possibility of reusing all its elements, eliminating the generation of any type of residues.

BACKGROUND OF THE INVENTION

[0003] As is known, in the preferred practical application of the invention, that of powder products, as for example paint in powder form, this paint is brought out of the containers in which it is supplied, either by pouring from the container to the tank of the device used for application, or by means of aspiration by the venturi effect to spray it on the surface to be painted with the aid of an electrostatic or triboelectric gun, to which a jet of air has access, producing a spraying of the same.

[0004] For the use of this type of products, poured by the manual pouring system into the applicator device tank or in the tank of the machine in which these products are to be used, there currently exists the solution consisting in the use of an emptying machine, in which the container or receptacle of the product to be applied is placed, which, due to its size makes its use in small locations impossible and which additionally generally requires the aid of a forklift truck for placing the container in the same, preferably using simple cardboard packs with an internal wrapper and plastic base. In all cases in which manual pouring does is not produced, an aspiration or ventura nozzle is used, simply by either inserting said nozzle on the bottom of the container, or by said aspiration device forming integral part of the emptying machine, in such a way that the aspiration is complemented with vibration and/or sloping of the container. In this invention the subsequent form of application of the product is not significant since the venturi may be directly connected to the application guns or else be used in the venturi for transferring the product to the actual tank of the machine or more complex applicator device which includes the guns or other application procedures or use.

[0005] The problem of this solution is mainly centred, in addition to the need of counting on a machine such as the one described of considerable size, on the fact that these containers are not reusable, with the consequent involved repercussion on costs, in addition to generating residues which sometimes prove to be difficult

to remove by the user; on the other hand they present difficulties for a total use of its contents, since in their terminal phase, that is to say, when a relatively small layer of product remains on the bottom of the container, it is difficult to remove by aspiration and finally involves transportation problems making necessary the aid of pallets for said handling.

DESCRIPTION OF THE INVENTION

[0006] The device proposed by the invention solves in a totally satisfactory manner, the previously described problem in the different aspects commented.

[0007] To achieve this, and more specifically, said device is constructed as a container, with a frusto-pyramidal configuration, divergent towards its mouth with a double function, on the one hand, to aid the displacement of its contents towards its bottom, and on the other hand, to additionally aid the lay-up of the empty containers, with the special particularity that said container is complemented with an internal immovable tray, in turn in the shape of a rectangular pyramid with appropriate dimensions, to establish, when it abuts its vertex on the bottom of the container, a perfect fit between its mouth and the side wall of the container, in such a manner, that said tray constitutes the bottom of the container compartment of the product established in the centre of the container, towards the vertex of which, it tends to move, allowing an integral use of the same without needing to carry out any type of handling in said container, tending to the final concentration of such a product.

[0008] Thus, each tray is placed inside the corresponding container in a loaded situation for the device, whilst in unloaded situation, it is capable of being extracted from the same, the containers being laid-up on one side and the trays on the other, to minimize its volumetric occupation under storage and transportation conditions.

[0009] In accordance with an embodiment variation of the invention, said internal tray may be eliminated and replaced by a body which, with the same frusto-pyramidal configuration as in the previous case, extends by its lower base into a pyramidal section, likewise rectangular, which mainly substitutes said interior tray, in which case, and in order to offer stability to the container, said body is complemented with a sustention bedplate, physically independent from the same, which in turn, adopts the rectangular, frusto-pyramidal configuration, in this case, divergent in descending direction, open both at the top and at the bottom, in such a manner, that through its upper mouth it receives inside, by coupling, the pyramidal section of the container which remains perfectly coupled and stable in said mouth and includes notches and transversally cut orifices, in correspondence with its bottom mouth, which permits the passage through the same of the arms of a truck pallet, a forklift truck or similar, capable of manipulating both the container as a whole and exclusively, the bedplate in inoperative situ-

ation.

[0010] In the first case, that is to say, when said bedplate does not exist, a plurality of projections, which determine the abutment legs, defining between each other longitudinal and transversal grooves, open towards the bottom and functionally equivalent to the bedplate notches, are established at the bottom of the container.

[0011] Logically, both in one case and in the other, said container shall be complemented with a lid, couplable to its mouth, provided with an over-cover which permits the insertion inside the container of the venturi or aspiration device, in closed condition, without requiring the removal of the main lid.

[0012] In any case, the lid shall be in turn provided with a recess, coinciding in shape, dimension and position with the perimeter of the projections of the bottom and closed base of the container, in order to facilitate in turn, the stability between containers during their lay-up in loaded situation, and also equivalent to the lower perimeter of the bedplate.

[0013] The body of the container shall be provided, on one of its side walls, with a bolt which, projecting towards the outside, is intended to constitute the attachment means of a vibrator of any conventional type which aids the descent of the product, avoiding formation of cavities inside the container.

[0014] The container shall be provided at the level of its mouth with a perimetral flange to aid the coupling of the lid, as well as with orifices for the immovable coupling of handles to help with the handling of the containers without hindering its vacuum lay-up, also counting on trays with handles to aid its manipulation.

[0015] According to this structure, an easily handled device is achieved, which determines a tightly sealed container, capable of containing a set amount of paint in powder form or of any other equivalent product, as for example, of approximately 500 Kg., which is easily transportable and handled, that assures, with the configuration of the container involved in the same, the integral consumption of the product housed inside, that may include in its bottom and free vertex, a plug that aids its cleaning for subsequent reuse, and that due to its actual structure, very considerably helps its storage and transportation when empty because they are capable of lay-up by means of coupling one with the other, the containers on one side and the interior trays or exterior bedplate on the other, and the corresponding lids also being capable of independent lay-up and of housing the laid-up bedplates, or the laid-up trays inside the laid-up bodies, likewise making possible the reuse of all its elements, eliminating the generation of any type of residues.

DESCRIPTION OF THE DRAWINGS

[0016] As complement to the description being made and to a reach better understanding of the characteristics of the invention according to a preferred practical

embodiment example of the same, a set of drawings is enclosed forming integral part of said description, and in which, with illustrative and non limitative character, the following has been represented:

Figure 1 shows a perspective break-down of a device for packing, storage, transportation and supply of pulverulent or similar products, carried out in accordance with the object of the present invention.

Figure 2 shows, also according to a perspective view, the same assembly of the previous figure, suitably mounted and partially sectioned to show its internal structure.

Figure 3 shows, according to a schematic, perspective representation, on the one hand, various containers and on the other, various trays, suitably laid-up when empty.

Figure 4 shows, according to a schematic perspective representation, an embodiment variation of the device of the invention, in which the lid appears uncoupled from the body, though the latter appears coupled to the corresponding bedplate.

Figure 5 shows a bottom, lateral perspective view of the body that forms part of the device in the previous figure.

Figure 6 shows a perspective detailed view of the complementary bedplate of the body in figure 5.

Figure 7 finally shows a side, plan view of a plurality of containers and bedplates like those in figures 5 and 6, suitably laid-up for empty storage and transportation.

PREFERRED EMBODIMENT OF THE INVENTION

[0017] In view of the described figures, and specially Figures 1 through 3, it can be observed how the device proposed by the invention, according to an embodiment variation of the same, is constituted as from a body or container (1), with frusto-pyramidal, rectangular and inverted configuration, of suitable capacity, as for example for a 500 Kg load of product, the mouth of which, is closed in sealed manner with the collaboration of a lid (2), coupled to said mouth by any conventional means, said body (1) being provided at its bottom with a plurality of projections or dimplings (3) which determine grooves (4), both longitudinal and transversal, with suitable shape and dimensions to permit the passage through the same, of the arms of a truck pallet or similar, whilst at the level of its mouth, the body (1) includes a perimetral flange (5), equipped with orifices (6) that permit the coupling, with immovable or dismountable character, of handles to facilitate the handling of said container, said

flange (5) in turn aiding the coupling of the lid (2), provided in turn with a perimetral apron (7) for coupling to the mouth of the body (1), specifically to said perimetral flange (5), said lid (2) being additionally provided with dimplings (8) positionally coincident with projections (3) of the bottom of body (1), intended for receiving said projections during their lay-up between closed containers.

[0018] Similarly, the lid (2) is provided at its centre with an over-cover (9) preferably of circular configuration, that permits the insertion of the venturi or aspiration device, without needing removal of said lid (2).

[0019] The body or container (1) is also complemented with an internal tray (10), with a rectangular pyramidal shape, open at its base, the vertex (11) of which is intended to abut on the centre of the body or container (1) bottom, in a limit position in which the mouth of said tray (10) is in contact with the side walls of the container (1), as can be specially observed in Figure 2, constituting the real bottom of the container which, due to its pyramidal configuration, aids the concentration of the product in the area corresponding to its vertex (11), to make easier its extraction.

[0020] Though the product tends to move downwards simply due to the effect of gravity, specifically to flow over said vertex (11) of the tray (10), it has additionally been provided that the container (1) includes on the outside, on one of its side walls, near its mouth, and suitably forming integral part of the same, a bolt (12), intended to constitute the attachment means to the device, of a vibrator of any conventional type, that helps the product to descend, preventing formation of cavities of the product inside the container.

[0021] The trays (10) include handles, not represented in the drawings, that in turn, help their handling.

[0022] In accordance with this structure, the containers (1), when empty, are inter-coupled in a male-female manner, to reduce volumetric occupation and to help their storage and transportation, to which purpose, the projections (3) shall also have a frusto-pyramidal configuration, on the other hand, the trays (10) being in turn, couplable in similar manner, with the same purpose and as can be understood from observing Figure 3, the lay-up of trays (10) capable of being housed inside the container (1) lay-up, specifically in the interior of the container (1) that adopts the top end position of the corresponding lay-up.

[0023] In the embodiment variation represented in Figures 4 through 7, body (21) that is complemented with a similar lid (22), adopts the same frusto-pyramidal, rectangular and inverted configuration, though its bottom projects downwards, determining a section (23) tending towards the conical configuration, specifically with a pyramidal, rectangular configuration, with rounded vertex (24), so that with this configuration for the container, the same concentration effect of the product as with the tray (10) of the previous embodiment, is achieved, maintaining the same lay-up possibility when

empty, as is shown in Figure 7.

[0024] In this case, the container body (21) includes at a level with its mouth, the same perimetral flange (25) and the same orifices (26) suitable for receiving handles that are physically independent from said body.

[0025] On its part, the lid (22) is equipped with the same perimetral apron (27) for coupling to the mouth of body (21), and includes a recess (28) suitably shaped and dimensioned to receive the lower end of a bedplate (29) that complements the device and which shall be described further on, that is recessed for immobilisation purposes of said bedplate (29) preventing the transversal displacement during lay-up. Additionally, lid (22) includes, in a centred position, the same over-cover (30) for inserting the aspiration device of the product without requiring the removal of the cover (22).

[0026] Bedplate (29) has the specific function of providing body (21) with the stability it lacks due to the special configuration of its lower end area, and adopts a frusto-pyramidal, rectangular configuration, suitably shaped and dimensioned to receive, by coupling, the lower end of the pyramidal section (23) of body (21), specifically through a small frame (31) that exists in the convergence area between the frusto-pyramidal section (21) of the body and the pyramidal section (23) of the same, specially visible in Figure 5.

[0027] This frame (31) includes a recess (32) which in this case houses the bolt (33) that is functionally equivalent to bolt (12) of the previous case.

[0028] Bedplate (29), evidently open at its top end to permit the coupling frame (31) of body (21), is also open at its bottom, as can be perfectly observed in Figure 6, is equipped at the level of its lower mouth and in correspondence with its larger, side faces with wide rectangular notches (34), suitably spaced and dimensioned to permit the passage of a truck pallet fork or similar, also establishing for the same purpose on the smaller side walls, transversally cut grooves or orifices (35), that however, leave the lower edge (36) continuous to permit the storage of the device in metallic shelves. Additionally, bedplate (29) includes mortises (37), near its upper mouth, in the manner of handles, to aid the manipulation of the same when they are found to be independent from the respective bodies (21).

[0029] The generally frusto-pyramidal configuration of the container bodies (21-23) permits the male-female coupling between them, as shown in Figure 7, so that the various containers (21) can be implanted on one single bedplate (29), at the same time that the complementary bedplates (29) are also male-female coupled to each other and laid-up by being inserted in inverted position inside the last container (21), as can be deduced by observing said Figure 7, to minimize its volumetric occupation when empty.

Claims

1. Perfected device for packing, storage, transportation and supply of pulverulent products in grain, flake, gamene and similar forms, as for example paint in powder form, **characterized in that** it is constituted by means of the functional combination of a container with its corresponding lid and an interior tray, coupled inside the container with immovable character, being provided that said container adopts a configuration tending towards a pyramidal frustum, rectangular and inverted, and that the lower tray in turn adopts a pyramidal configuration, with vertex intended to abut on the centre of the container bottom and the mouth of which, is suitably shaped and dimensioned so that when said vertex abuts on the container bottom, its edges abut in turn on the side walls of said container, establishing continuity between the walls of the tray and the area of the container walls situated over them.
2. Perfected device for packing, storage, transportation and supply of pulverulent products in grain, flake, gamene and similar forms according to Claim 1, **characterized in that** the container includes on its bottom or closed base, a plurality of projections or dimplings in the manner of legs, that determine a pair of longitudinal grooves and another of transversal grooves, suitably shaped and dimensioned to permit the passage through the same, of truck pallet or similar arms.
3. Perfected device for packing, storage, transportation and supply of pulverulent products in grain, flake, gamene and similar forms, according to the previous Claims, **characterized in that** the container includes on one of its side walls, on the outside and adjacent to one of its mouths, a bolt for coupling a vibrator.
4. Perfected device for packing, storage, transportation and supply of pulverulent products in grain, flake, gamene and similar forms, according to the previous Claims, **characterized in that** the container includes a perimetrical flange at the level of its mouth, coplanar with said mouth, in which orifices are established, which permit the coupling with immovable character, of manipulation handles of said body, with the possibility of similar handles existing in the complementary tray.
5. Perfected device for packing, storage, transportation and supply of pulverulent products in grain, flake, gamene and similar forms, according to the previous Claims, **characterized in that** the lid includes recesses, suitably shaped and dimensioned to receive the container base projections, in the lay-up between the closed containers in loading situation, at the same time establishing, an over-cover in the middle area of said lid, suitably shaped and dimensioned to permit the passage through the same, of the venturi or product extraction device.
6. Perfected device for packing, storage, transportation and supply of pulverulent products in grain, flake, gamene and similar forms, according to the previous Claims, **characterized in that** the diverse containers are inter-couplable in a male-female manner in the lay-up vacuum situation, as occurs with the complementary trays.
7. Perfected device for packing, storage, transportation and supply of pulverulent products in grain, flake, gamene and similar forms **characterized in that** it is constituted by means of the functional combination of a container with its corresponding lid and of a lower sustentation bedplate of the same, with the special particularity that in said container two superposed sections are defined, an upper, major one with frusto-pyramidal, rectangular and inverted configuration, and a lower one, tending towards a conical configuration with rounded vertex, couplable with immovable character inside the bedplate gap, which in turn adopts a frusto-pyramidal rectangular configuration, though here, divergent in descending direction.
8. Perfected device for packing, storage, transportation and supply of pulverulent products in grain, flake, gamene and similar forms, according to Claim 7, **characterized in that** the container includes on the outside, a small perimetral frame on the bedplate union area .
9. Perfected device for packing, storage, transportation and supply of pulverulent products in grain, flake, gamene and similar forms, according to Claims 7 and 8, **characterized in that** the container preferably includes a bolt, at a middle level of one of the larger sides of the perimetral frame, for coupling a vibrator.
10. Perfected device for packing, storage, transportation and supply of pulverulent products in grain, flake, gamene and similar forms, according to Claims 7 through 9, **characterized in that** the bedplate, also open at its lower base, with rectangular contour, coincident with the recess or crevice or the top lid, includes, in correspondence with said lower base, notches and grooves or transversally cut orifices, suitably shaped, dimensioned and positioned to permit the passage of a truck pallet or similar fork.
11. Perfected device for packing, storage, transportation and supply of pulverulent products in grain, flake, gamene and similar forms according to

Claims 7 through 10, **characterized in that** the lid includes a recess, suitably shaped and dimensioned to receive inside, the lower end of the bedplate during the lay-up between the containers in loaded situation, at the same time that in the middle area of said lid an over-cover with circular configuration is established, dimensionally suitable to permit the passage through the same, of the venturi or extraction device.

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12. Perfected device for packing, storage, transportation and supply of pulverulent products in grain, flake, gamene and similar forms according to Claims 7 through 11, **characterized in that** the body includes, at a level with its mouth a perimetral flange in which orifices are established, which permit the coupling of handles for manipulation of said bodies when empty, at the same time that in the bedplate and adjacent to its top end, mortises are established, also with the function of handles for manipulation.

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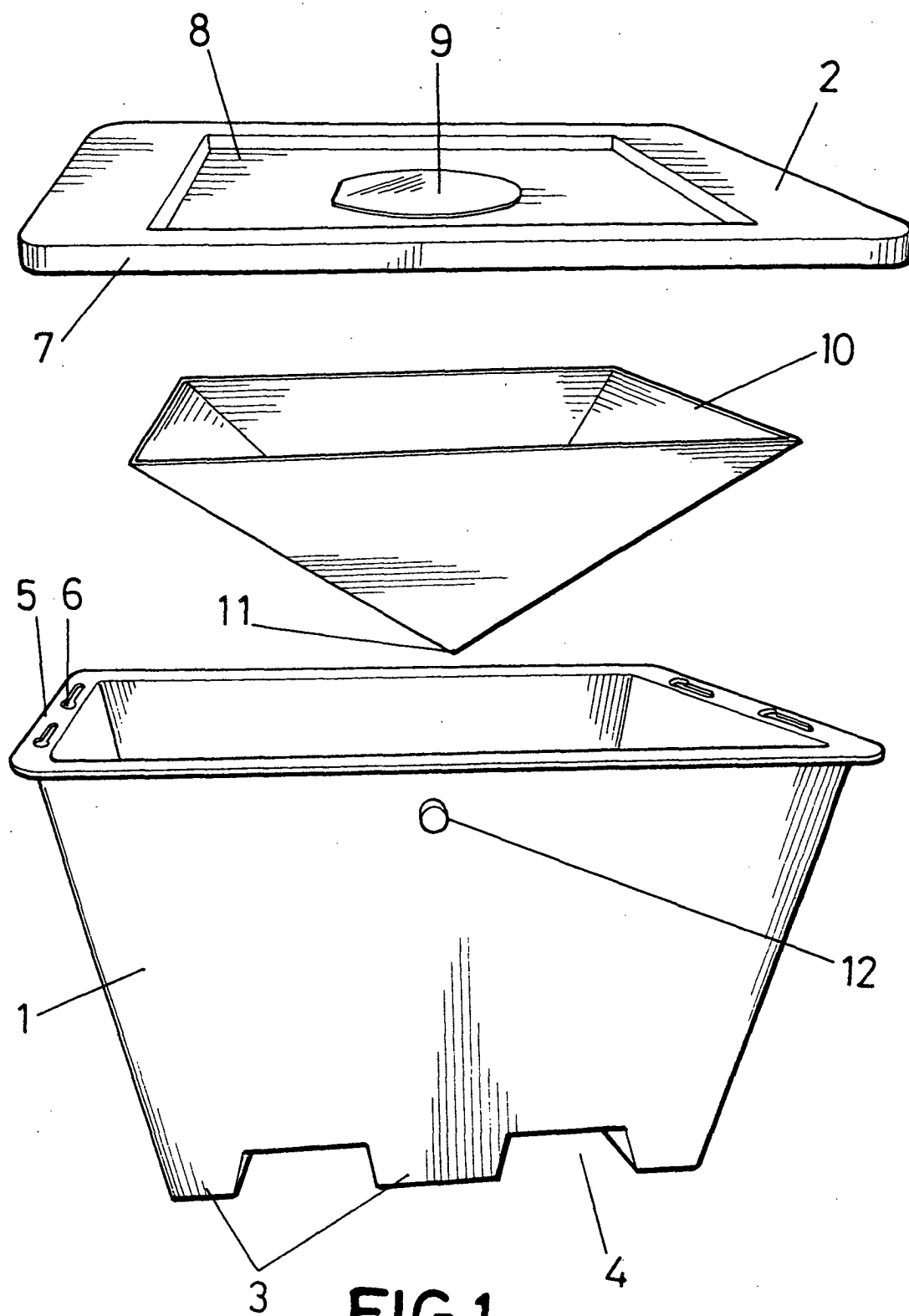


FIG.1

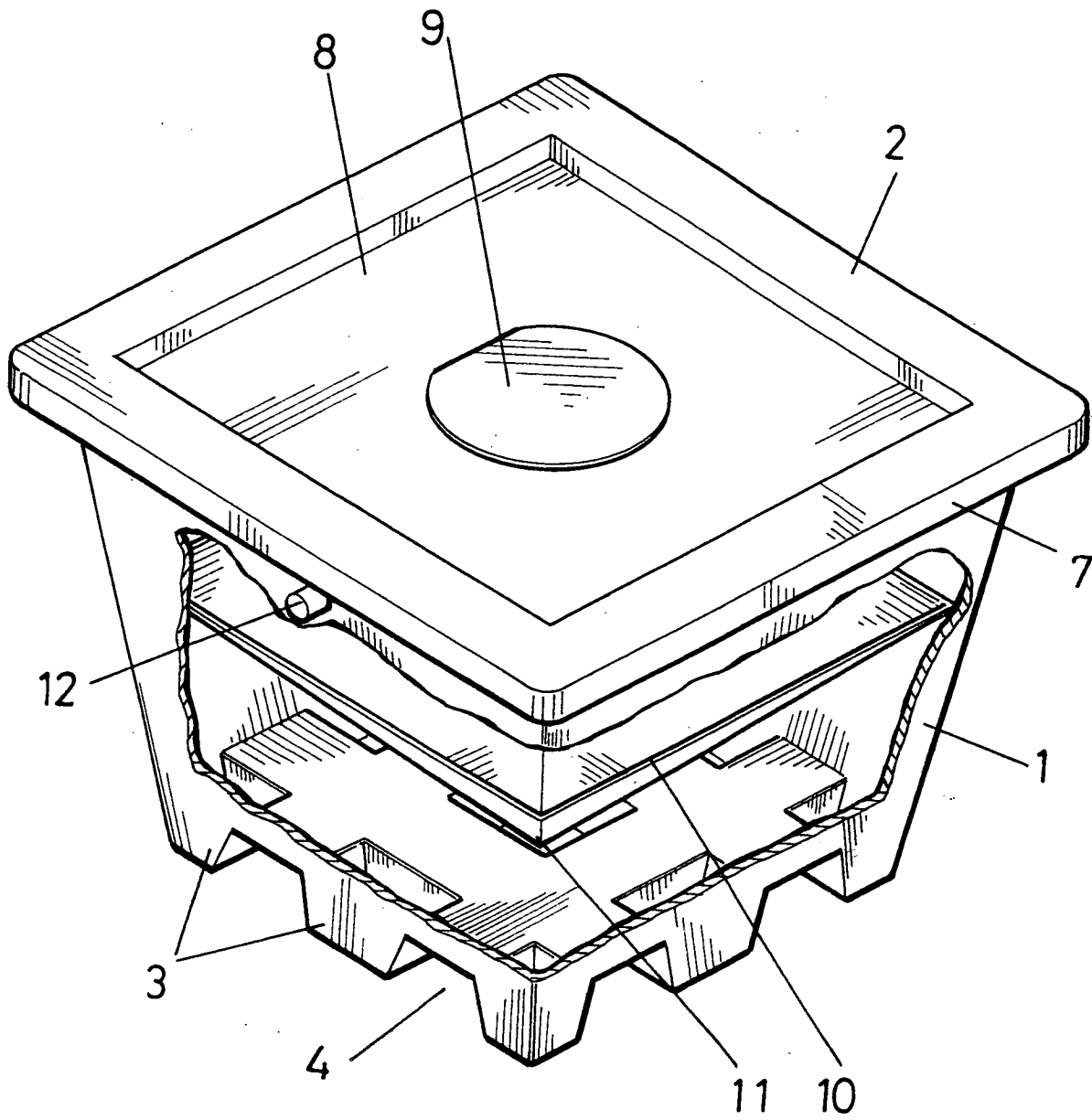
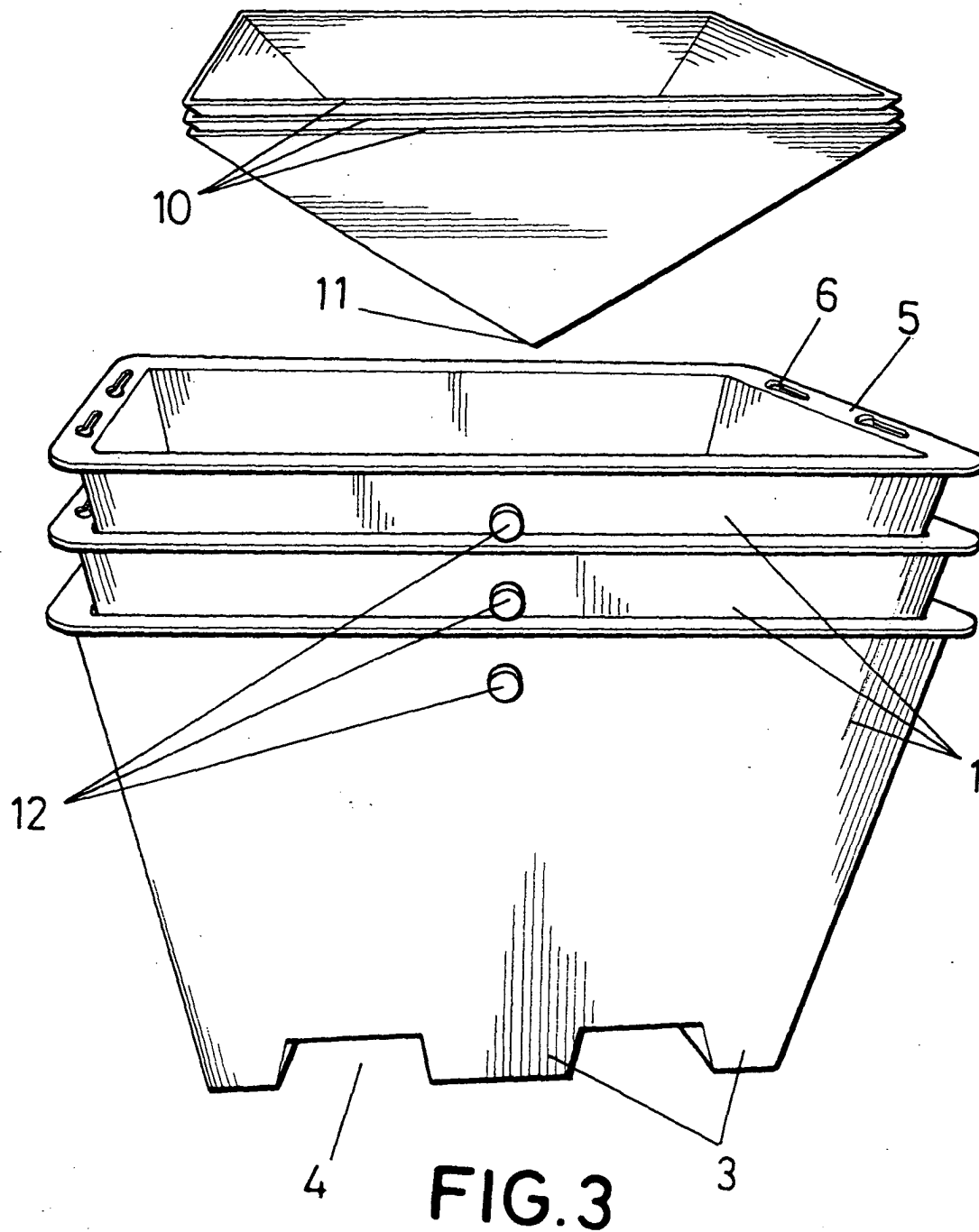


FIG. 2



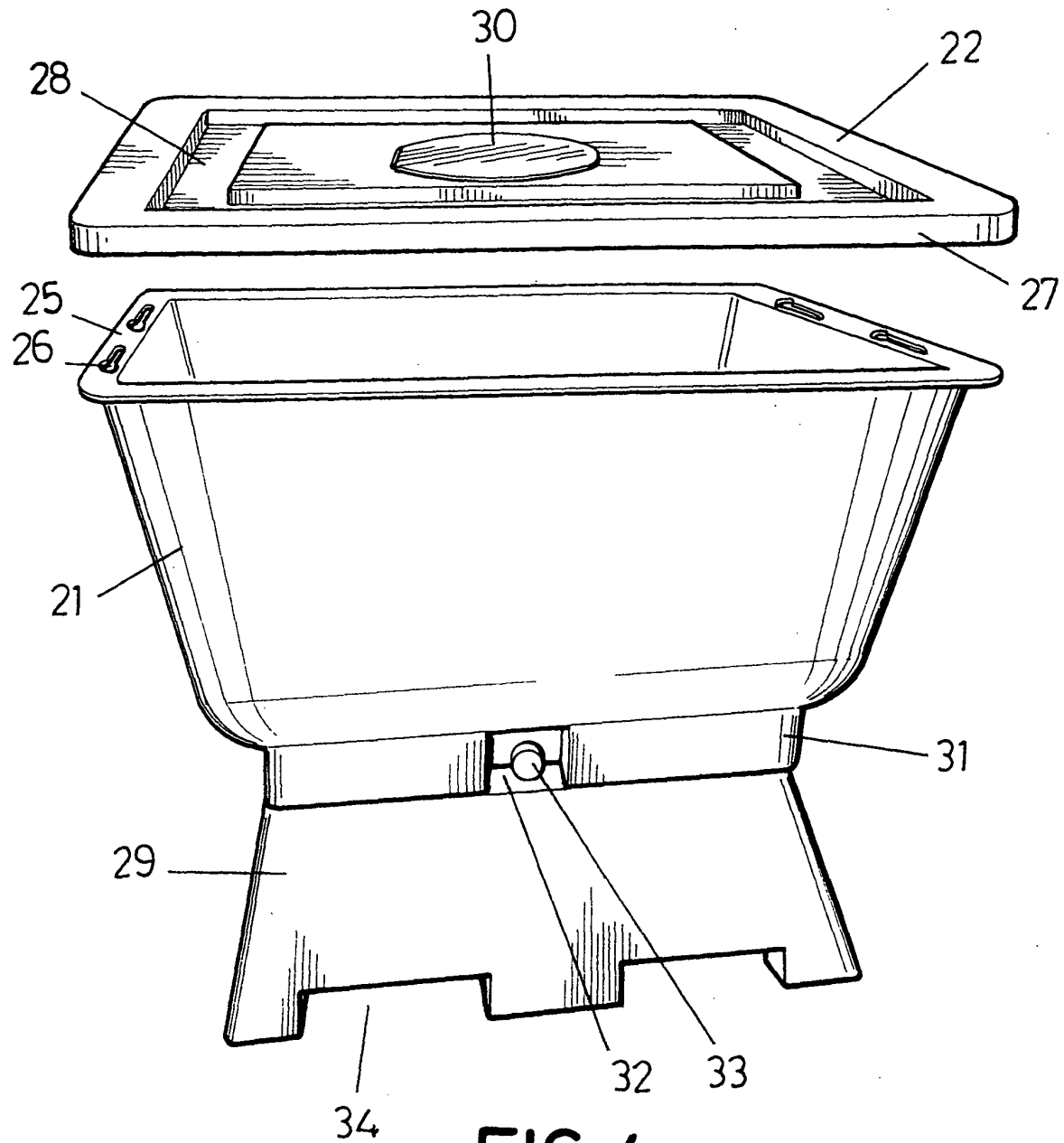
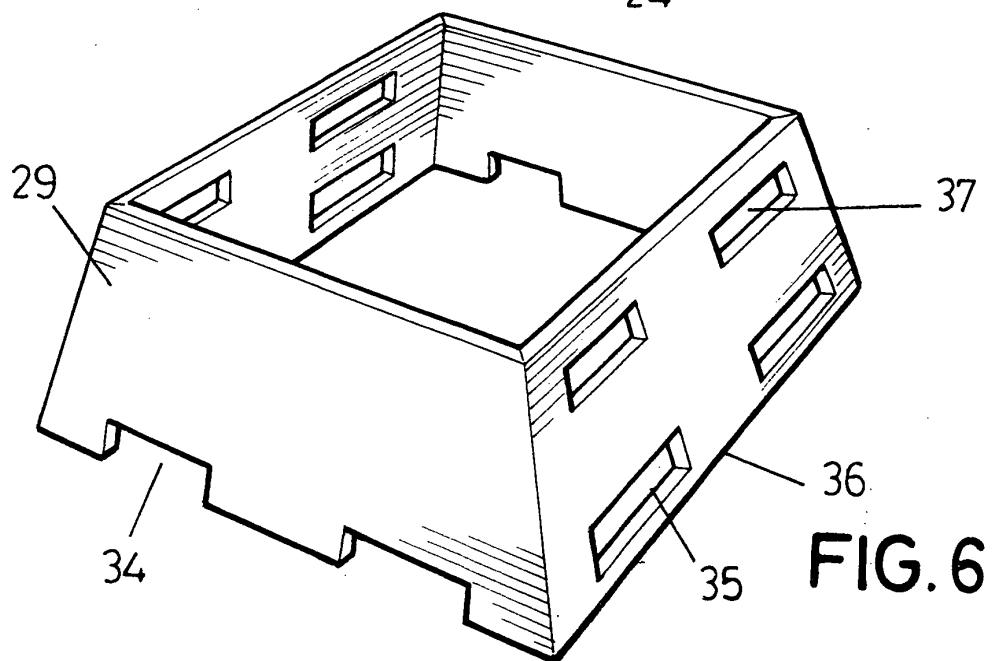
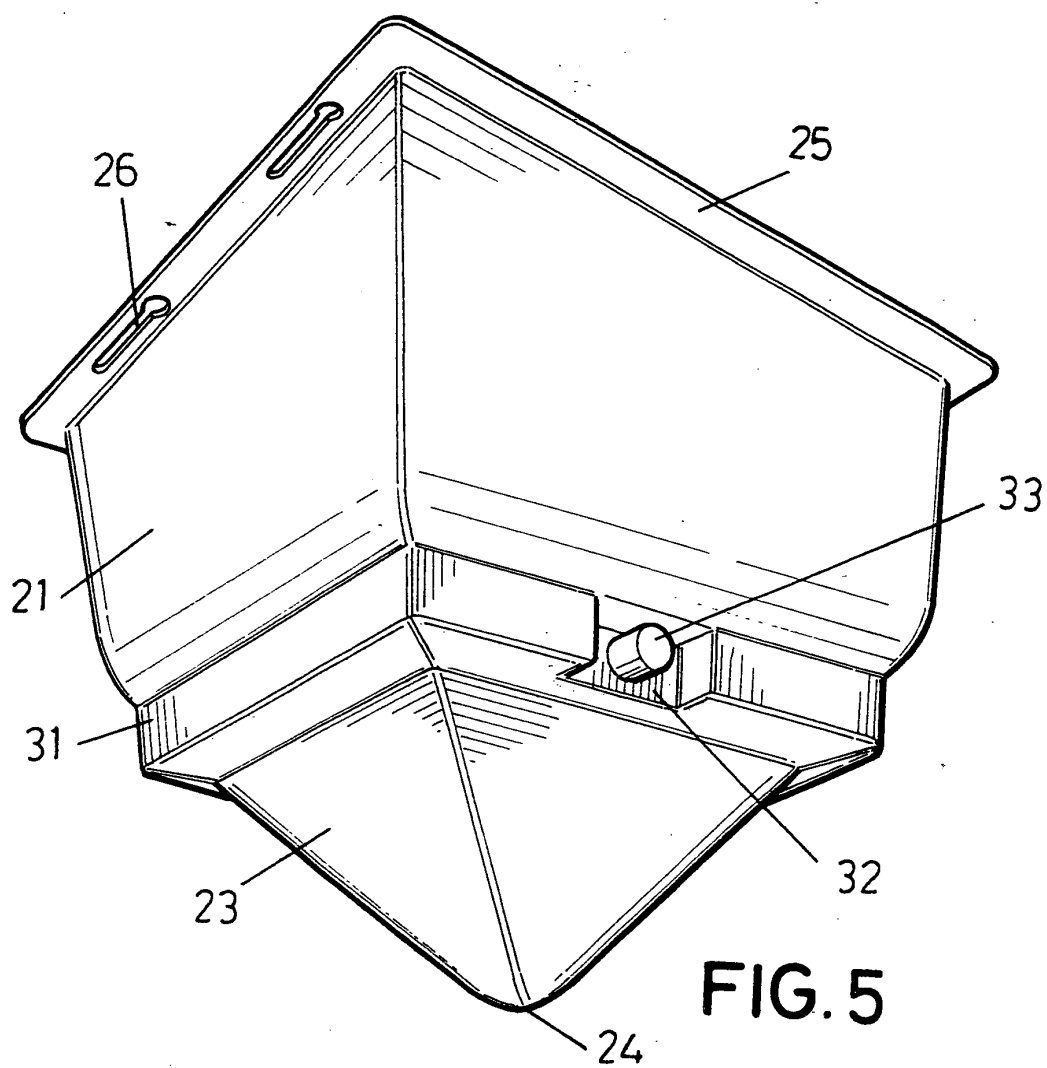
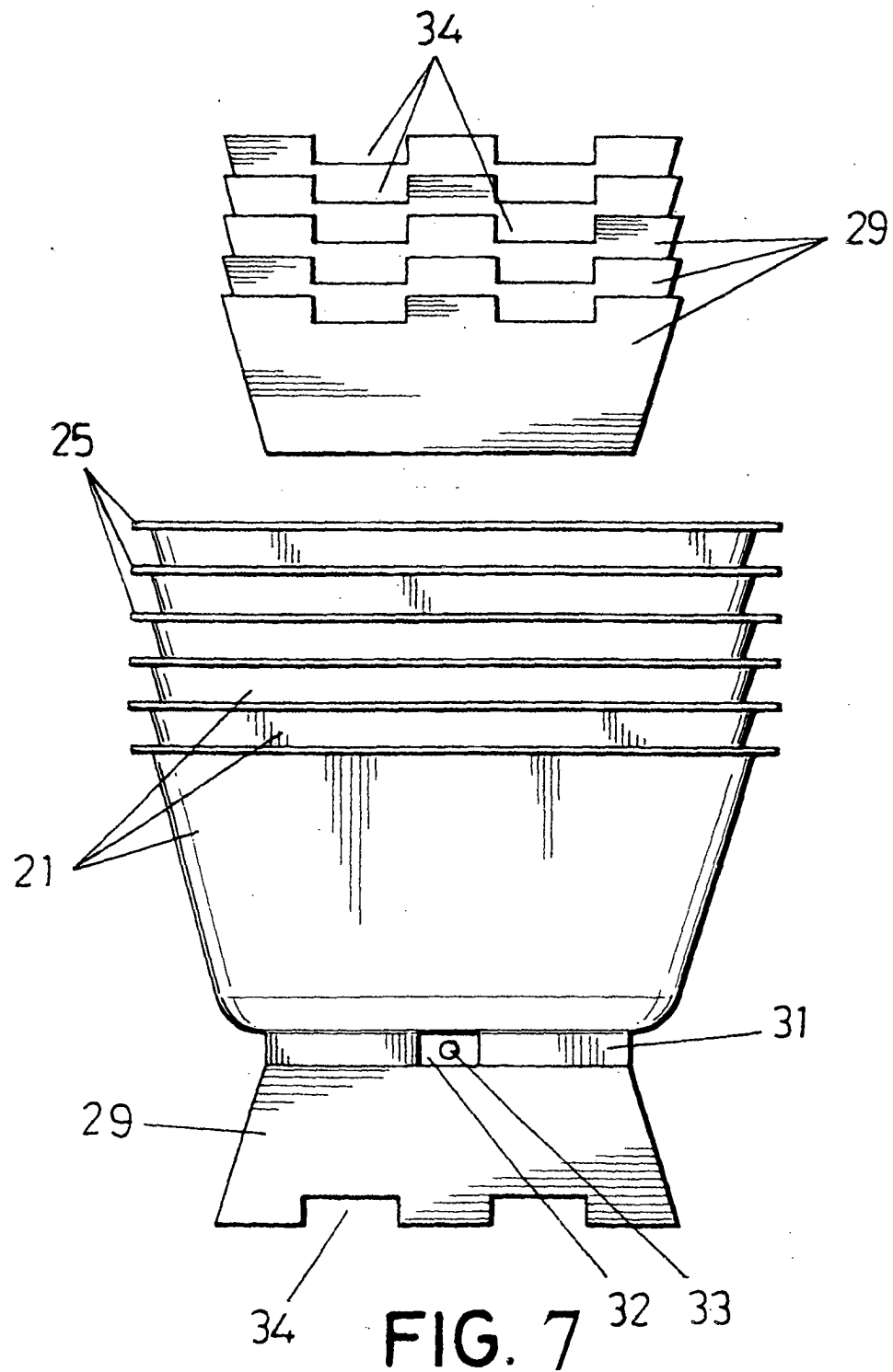


FIG.4







European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 03 38 0278

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The present search report has been drawn up for all claims			
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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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