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(71) Applicant: **Linpac Mouldings Limited**
Birmingham, B37 7YN (GB)

(72) Inventors:
- **Mallan, Lee**
  Hartford, Northwich CW8 3AQ (GB)
- **Bailey, Mark William**
  West Midlands WS3 4LH (GB)
- **Loftus, Stephan Clive**
  West Midlands WS3 4JN (GB)
- **Carr, Nicolas**
  Worcestershire WR7 4AN (GB)
- **Buckley, Robert James**
  Derbyshire DE75 7PZ (GB)

(74) Representative: **Raynor, Simon Mark et al**
Urquhart-Dykes & Lord
Midsummer House
413 Midsummer Boulevard
Central Milton Keynes MK9 3BN (GB)

(54) Pallet

(57) A pallet (2) has a substantially planar deck (6), a supporting structure (10) that supports the deck (6) above the ground, and a plurality of retractable locating means (20). Each locating means (20) is adjustable between a first position in which the locating means extends above the deck (6) to engage and limit movement of articles placed on that surface, and a second position in which the locating means is located at or below the deck (6), such that the surface is substantially unobstructed.

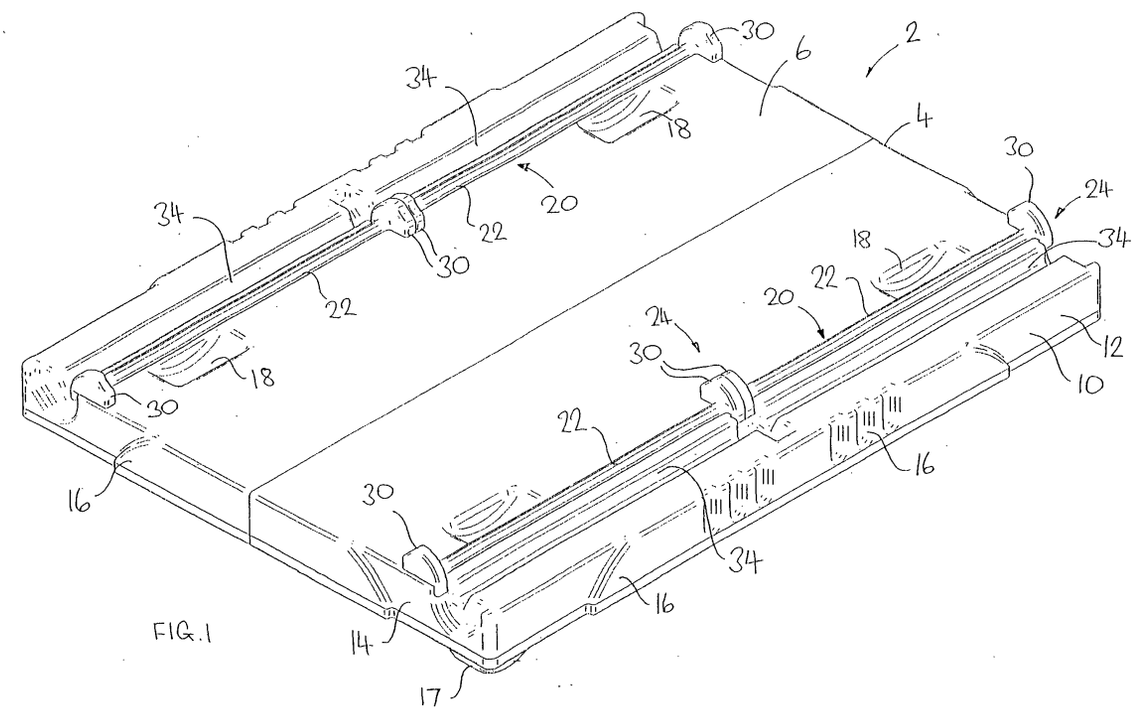

FIG.1

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Description

[0001] The present invention relates to a pallet for use in the transportation of goods. In particular, but not exclusively, the invention relates to a roll pallet.

[0002] Pallets are conventionally used for transporting goods, for example from a warehouse to a supermarket and within the supermarket. Generally, a pallet consists of a low platform that supports the goods above the ground and allows them to be easily lifted and transported. Conventionally, roll pallets can be made from either wood or a plastics material. The pallet may be mounted on wheels or castors for easy movement: such pallets are known as "roll pallets" or "dollies".

[0003] Containers for carrying goods may be retained on the pallets by strapping, packaging film or the like. Conventionally, the containers are removed from the pallets at the retail premises, prior to being put on display to customers, and empty pallets are returned for reuse. However, it may be desirable for commercial reasons for some types of goods (such as bags of sugar or flour, flat trays of tinned goods etc.) to be placed on display to customers while still on the pallet. Other goods may be displayed in their delivery containers but not on the pallet. Still other goods may desirably be removed from the pallet and from the delivery containers.

[0004] In the retail industry, pallets may be used for transporting cartons, boxes or plastic-wrapped bales of goods such as soap powder, bottles or tinned foods. Alternatively, they may be used for transporting goods such as fresh fruit and vegetables in open-topped containers (otherwise known as crates). In order to transport general goods such as cartons or plastic-wrapped bales, it is essential that the top surface of the pallet is substantially flat, as any protrusion might catch and tear the cartons or plastic wrapping. However, a flat surface is not ideal when transporting crates, as they can sometimes slide about on the surface of the pallet during transportation, since there is nothing to hold them in place.

[0005] It is an object of the present invention to provide a pallet that mitigates the aforementioned disadvantage of existing pallets.

[0006] According to the present invention there is provided a pallet including a deck having a load bearing surface and at least one locating means, said locating means being adjustable between a first position in which the locating means extends above the deck to engage and limit movement of articles placed on the deck, and a second position in which the locating means is located at or below the load bearing surface of the deck, such that the deck is substantially unobstructed.

[0007] The locating means may be used with suitable articles such as goods crates to prevent movement of those articles on the pallet. Alternatively, the locating means may be retracted to provide a substantially flat load bearing surface that is suitable for use with general goods, such as cartons, boxes or bails of goods.

[0008] Advantageously, a plurality of locating means are distributed across the deck.

[0009] Advantageously, the or each locating means is complementary in shape to features of articles to be placed on the deck.

[0010] The or each locating means may be pivotably attached to the deck. Advantageously, the or each locating means is an elongate member that is pivotably attached to the deck at each end of the elongate member. Preferably, the or each locating means is pivotable between a first position in which it extends above the deck, and a second position in which it is located at or below the load bearing surface of the deck. The or each locating means preferably rests on the deck when located in said first position. The or each locating means may be accommodated within a recess in the deck when located in said first position. The or each locating means may be accommodated within a recess in the deck when located in said second position.

[0011] Advantageously, the locating means includes at least one pivotable bar member that is pivotable between a first position in which it extends above the upper load bearing surface, and a second position in which it is located at or below the upper load bearing surface. The bar may be constructed and arranged so as to engage a corresponding recess on the underside of an open-topped crate.

[0012] The pivotable bar member may rest on the upper load bearing surface when located in said first position, and may be accommodated within a recess in the upper load bearing surface when located in said second position.

[0013] The pivotable bar may include end stop members, which may rest on the upper load bearing surface when the pivotable bar member is located in said first position, and may be accommodated within corresponding recesses in the upper load bearing surface when located in said second position. The end stop members may be constructed and arranged to engage the side walls of suitable crates when placed on the pallet, to prevent sideways movement of the crates.

[0014] The or each locating means may include end stop members. The end stop members may rest on the deck when the or each locating means is located in said first position. The end stop members may be accommodated within corresponding recesses in the deck when located in said second position.

[0015] The or each locating means may include at least one stop member for engaging a side of an article to be carried by the pallet, each said stop member being adjustable between a first position in which it extends above the deck, and a second position in which it is located at or below the load bearing surface of the deck. Advantageously, the or each stop member is accommodated within a recess in an end edge of the pallet when located in said second position. Preferably, the or each stop member is mounted for pivoting and/or sliding movement between said first and second positions. The

or each stop member may be resiliently biassed towards said first position. Preferably, the or each stop member will retract under the weight of an article placed on the deck.

[0016] The load bearing surface of the deck may be substantially planar.

[0017] The pallet may include a supporting structure that, in use, supports the deck above the ground.

[0018] Advantageously, the pallet includes wheels or rollers.

[0019] Embodiments of the invention will now be described by way of example with reference to the accompanying drawings, in which:

Fig. 1 is an isometric view of a first pallet according to the invention, in a first configuration;

Fig. 2 is an isometric view of the first pallet in a second configuration;

Fig. 3 is an isometric view of the first pallet in the first configuration, supporting a number of goods containers;

Fig. 4 is an isometric view of part of the first pallet at a larger scale;

Fig. 5 is an isometric view of a second pallet according to the invention, in a first configuration;

Fig. 6 is an isometric view showing part of the second pallet, in a second configuration;

Fig. 7 is a side view showing part of the second pallet;

Fig. 8 is an isometric view showing part of a third pallet according to the invention;

Fig. 9 is a side section showing part of the third pallet;

Fig. 10 is an isometric view showing part of a fourth pallet according to the invention;

Fig. 11 is a side section showing part of the fourth pallet;

Fig. 12 is an isometric view showing part of a fifth pallet according to the invention;

Fig. 13 is a side section showing part of the fifth pallet;

Fig. 14 is an isometric view showing part of a sixth pallet according to the invention, and

Fig. 15 is a side section showing part of the sixth pallet.

Figs. 16a, b and c are perspective views of a seventh embodiment of a pallet according to the present invention, illustrated in various conditions during use;

Figs. 17a, b and c illustrate the pallet of Fig. 16 in the corresponding conditions and on an enlarged scale, and

Fig. 17d is a section along the line D-D of Fig. 17c, schematically illustrating the pivot arrangement of the pallet;

Fig. 18a illustrates the pallet of Fig. 16, supporting two containers; and

Fig. 18b illustrates engagement between one of the containers and the pallet, on an enlarged scale;

Fig. 19a illustrates the pallet of Fig. 16 carrying goods which are not in rigid delivery containers; and

Fig. 19b illustrates the condition of the pallet for receiving the goods as illustrated in Fig. 19a.

Figs. 20a, b and c are perspective views of a eighth embodiment of a pallet according to the present invention, in alternative conditions;

Figs. 21a, b and c are enlarged perspective views corresponding with the views of Figs. 20a, b and c, illustrating pivot arrangements in more detail;

Figs. 22a and b illustrate the pallet of Figs. 20 and 21 when supporting rigid containers;

Figs. 23a and b illustrate the pallet of Figs. 20 and 21 when supporting goods not housed in rigid containers;

Fig. 24a is a perspective view of a ninth embodiment of a pallet according to the present invention and Fig. 24b shows the ninth embodiment when supporting two containers;

Figs. 25a and 25b are enlarged perspective views of the pallet of Fig. 20a, showing locating means in the projecting and retracted positions, respectively;

Fig. 25c is a section along the lines C-C of Fig. 25a;

Fig. 26a is a perspective view of the pallet of Fig. 20 in an alternative condition;

Fig. 26b shows the pallet supporting goods not housed in delivery containers, when in that alterna-

tive condition; and

Fig. 27 is a schematic partial vertical section through a modified version of the ninth embodiment, when supporting a container.

[0020] A first pallet 2 according to the invention is shown in Figs. 1 to 4. The pallet 2 includes a substantially rectangular pallet 4 having a deck 6 that serves in use as a load bearing surface for supporting goods. A peripheral wall 10 depends from the deck 6, the wall 10 including two longitudinal side walls 12 and two end walls 14. Reinforcing formations 16 are provided in the side and end walls to increase their rigidity. A wheel or castor 17 is provided in each corner of the pallet, which in use supports the pallet and allows it to be moved about. Four recesses 18 are provided in the corners of the surface for receiving in use the wheels of another roll pallet stacked on the first pallet. The pallet 4 may be a plastics moulding.

[0021] Retractable locating means 20 are provided for locating goods placed on the load bearing surface 6 of the pallet 2, so as to prevent them from moving about on that surface. Two such locating means 20 are provided, each locating means comprising two pivotable bars 22 that extend end-to-end parallel to the longitudinal side walls 12.

[0022] Each end of each bar 22 is connected to a pivot mechanism 24 including a pivot pin 26 (shown most clearly in Fig. 4) that is located in a pivot mount 28 in the pallet 4. This pivot mechanism allows the bar 22 to pivot about a pivot axis that is parallel to the side walls 12 and located just below the surface 6 of the pallet. The axis of the pivot mechanism is thus offset from the bar 22. Each pivot mechanism 24 also includes a D-shaped end plate 30 that is attached to an end of the bar 22 and extends from the bar in a direction that is approximately opposite to the offset of the pivot pin 26. In the remote end of each end plate 30 a small depression 32 is provided, which serves as a finger grip. A recess 34 that matches the shape of the bar 22 and the D-shaped end plates 30 is provided in the surface of the pallet 4, adjacent the locating means 20.

[0023] The pivot mechanism 24 allows the bar 22 to pivot through an angle of approximately 180° between a first position as shown in Fig. 1 in which the bar 22 and the end plates 30 sit on top of the pallet 4 and extend upwards from the deck 6 of the pallet, and a second position as shown in Fig. 2 in which the bar and the end plates are accommodated within the corresponding recesses 34, so that they lie substantially flush with or slightly below the deck 6.

[0024] When the locating means 20 are in the second position as shown in Fig. 2, the upper surface 6 of the pallet is substantially flat and free of obstructions. In this configuration the pallet is suitable for carrying general goods such as boxes, cartons or bails of goods wrapped in plastics sheet.

[0025] When the locating means 20 are in the first position as shown in Fig. 1, the locating means extend above the upper surface 6 of the pallet. In this configuration, the pallet 2 is suitable for carrying conventional open-topped crates 36,38 as shown in Fig. 3. It will be noted that two types of crate are shown, one being twice as large as the other. Such crates (of both sizes) conventionally include two recesses 40 in the underside of the base, which extend across the base parallel to a first pair of walls 42 of the crate. The crate is placed on the pallet so that the bar 22 engages at least one of those recesses 40, preventing movement of the crate in a direction perpendicular to the side walls 12 of the pallet. At the same time, the end plates 30 engage the second pair of walls 44 of the crate, preventing movement in the orthogonal direction. The locating means 20 therefore serve to locate the crates 36,38 in position relative to the pallet 2, preventing relative movement of the two.

[0026] The crates 36,38 are of a kind that can be stacked, one on top of another in a column-like fashion. Movement of the crates relative to one another is prevented in conventional manner by the stacking mechanism.

[0027] A second pallet according to the invention is shown in Figs. 5 to 7. The pallet includes a pallet 104 that is basically similar to that of the first pallet described above, having an deck 106 and feet 118 that support the pallet 104 above the ground.

[0028] Locating means 120 in the form of pivotable bars 122 are provided adjacent the longitudinal side edges 112. In addition, the pallet includes additional locating means 150 at each of the end edges 114, each of which comprises a pivotable stop member 152 that is attached to the pallet by means of pivot mounts located in recesses 154 provided in the centre of the side edge.

[0029] The stop member 152 has a substantially L-shaped body member and is mounted by means of pivot mounts that permit both pivoting movement and sliding movement relative to the pallet 104. These mounts are constructed and arranged to allow the stop member to be located in a first position as shown in Fig. 5 in which the stop member 152 lies flush with or below the deck 106 of the pallet, and a second position as shown in Figs. 6 and 7, in which one arm of the L-shaped body member extends above the upper surface of the pallet, so providing a stop that locates and engage a crate placed on the pallet, to prevent relative movement between the crate and the pallet.

[0030] In order to move the stop member from the first position shown in Fig. 5 to the second position shown in Fig. 6, the lower edge of the body member 152 is pulled outwards and upwards, causing the body member to rotate through an angle of 90° relative to the pallet. The body member 152 then slides inwards towards the centre of the pallet, locating it securely in position in the recess 154. To return the stop member to its first position, these movements are reversed.

[0031] As shown in Figs 6 and 7, the stop member

152 includes a slot 156 that extends upwards from the upstanding arm of the body member when it is in the second position. This slot 156 may serve as sign holder to hold a label or point of sale information concerning the products carried by the pallet.

[0032] Figs. 8 and 9 illustrate a third embodiment of the invention, in which the pallet 202 includes an alternative version of the stop member shown in Figs. 5 to 7. In this third version of the pallet, the stop member 252 is again pivotable and is mounted in a recess 254 in the end edge of the pallet 204. The pivot mount is located such that the pivot axis lies substantially in plane of the deck 206, adjacent the end edge 214 of the pallet, and the stop member 252 is mounted so as to be rotatable through an angle of approximately 270° from a first position shown in solid lines in Fig. 9, to the second position shown in broken lines. In the first position, the stop member 252 is located flush with or below the upper surface 206 of the pallet and in the second position an arm 256 extends upwards above the upper surface 206 to locate and retain a crate placed on the pallet.

[0033] Figs. 10 and 11 illustrate a fourth embodiment of the invention, in which the pallet includes another version of the stop member . In this version of the pallet, the stop member 352 is pivotable and is mounted above a recess 356 in the end edge of the pallet 304. The pivot mount is located such that the pivot axis lies substantially in plane ofthe deck 306, adjacent the end edge of the pallet, and the stop member 352 is mounted so as to be rotatable through an angle of approximately 20 ° from a first position shown in solid lines in Fig. 10, to the second position shown in broken lines. In the first position, the stop member 352 extends upwards above the upper surface 306 to locate and retain a crate placed on the pallet, and in the second position it is accommodated within the recess 356 and is located flush with or below the upper surface 306 of the pallet. A spring 360 located within the recess 356 engages the stop member 352 and biasses it upwards to the first position. The stop member 352 may however be pushed downwards into the recess against the bias of the spring.

[0034] Figs. 12 and 13 illustrate a fifth embodiment of the invention, in which the stop member 452 is mounted for vertical sliding movement within a recess 456 in the end edge of the pallet 404. The stop member 452 includes a guide slot 470 through which there extends a guide pin 472. The guide slot 470 includes a detent 474 that locks the stop member in a raised or lowered position. The wall of the guide slot 470 on which the detent 474 is mounted is resilient and may be deformed slightly to allow the detent to move past the guide pin 472 when subjected to sufficient force. The stop member 472 is thus mounted so as to be movable between a first position in which the stop member is accommodated within the recess 456 and is located flush with or below the upper surface 406 of the pallet, and a the second position in which it extends upwards above the upper surface 406 to locate and retain a crate placed on the pallet.

[0035] Figs. 14 and 15 illustrate a sixth embodiment of the invention, in which the stop member 552 is mounted for sliding and pivoting movement about a pivot pin 555 within a recess 556 in the end edge of the pallet. The stop member 552 is mounted so as to be movable between the first position shown in solid lines in Fig. 13, and the second position shown in broken lines. In the first position, the stop member is accommodated within the recess and is located flush with or below the upper surface 506 of the pallet, and in the second position it extends upwards above the upper surface 506 to locate and retain a crate placed on the pallet. The stop member can be repositioned from the first to the second position by lifting it upwards, rotating it through an angle of 90° and sliding it inwards.

[0036] Figures 16 to 27 of the drawings show various additional embodiments of pallets according to the present invention. Some features are common to all of these embodiments, other features differ between the embodiments but correspond, and still other features occur in only one of the embodiments. Accordingly, the same reference numeral will be used in relation to each embodiment to indicate features common to all embodiments, with a letter suffix (a, b, c etc.) where appropriate to indicate features which correspond between embodiments but are different in each embodiment.

[0037] Figures 16 to 27 of the drawings illustrate pallets 610a, 610b, 610c, 610d for containers such as rigid containers or boxes 612, and bags or sacks 614. The pallets 610a, b, c, d have a deck 616 on which containers 612, 614 rest when being supported by the pallets 610a, b, c, d. The pallets 610a, b, c, d further have at least one locating means 618a, b, c which has a projecting position (Figs. 616a, 617a, 620a, 621a, 624a, 625a, 627) in which the locating means 618a, b, c, d projects from the deck 616 to obstruct movement of a container 612, 614 across the deck 616. A retracted position (Fig. 616c,617c, 620c, 621c, 626a,6 27) is also provided, in which the deck 616 is left unobstructed by the locating means 618a, b, c, d.

[0038] Turning in more detail to the seventh embodiment (Figs. 16-19, the pallet 610a is provided with two locating means 618a in the form of bars 620. The bars 620 are generally straight and extend parallel with each other across substantially the whole extent of the deck 616. The bars are attached to the pallet 610 at each end by means of short transverse legs6 22 extending from the ends of the bars 620. The ends of the legs 622 remote from the bars 620a extend into channels 6 24 in the deck 616 (Fig. 17d) and carry lugs 626 transverse to the legs 622 (and therefore parallel to the bars 620). The lugs 626 are received in sockets 628 in the walls of the channels 624 to provide a pivot connection between the legs 622 and the pallet 610a, thus providing a pivot connection between the bars 620 and the pallet 610a.

[0039] Accordingly, the bars 620 can be swung between the position of Figs. 16a,17a, through the intermediate positions of Figs. 16b, 17b, to the alternative

position of Fig. 16c, 17c.

[0040] Recesses 630 are provided in the deck 616 for receiving the bars 620 in each of the final positions.

[0041] When the bar 620 is in the position of Fig. 16a, 17a, an extension 632 extends out from the recess 630 to project above the deck 616, forming a rib across the deck 616. In addition, a similar extension 634 of each leg 622 similarly extends above the deck 616 to provide a short rib transverse to the rib provided by the extension 632. The significance of these ribs will be explained below. By virtue of the projection of the ribs 632, 634 in the position shown in Figs. 16a, 17a, this position will be referred to herein as the projecting position.

[0042] In the alternative final position of Figs. 16c, 17c, it can be seen (particularly from Fig. 17c) that the bar 620, which is now inverted relative to the pallet by virtue of pivoting from the projecting position, is received within the respective recess 630 without projecting out from the recess 630, above the deck 616. The deck 616 is thus unobstructed by the presence of the bars 620 and accordingly, the position of Figs. 16c, 17c will be referred to herein as the retracted position.

[0043] The depth and profile of the recesses 630 may differ, in order to accommodate the bars 620 in the two final orientations.

[0044] Although the bars 620 are described as being received in recesses 630 in both positions, the use of cranked legs 622 would allow the bars 620 to sit on the face of the deck 616 when in the projecting position, thus not requiring a recess, there nevertheless being a recess provided for receiving the bars when in the retracted position.

[0045] The significance of the projecting and retracted positions can now be described in more detail, with particular reference to Figs. 18 and 19.

[0046] Figs. 18a and 18b illustrate the pallet 610a with the bars 620 in the projecting position of Figs. 16a, 612 have channels 636 in their bases (Fig. 18b), primarily intended to sit over stacking bars of another container, in conventional manner. However, it can be seen, particularly from Fig. 18b, that the ribs 632 are located and oriented on the deck 616 to fit into the corresponding channels 636. Similarly, the wall 638 of the container 612 lies closely alongside the rib 634. Consequently, the containers 612 are obstructed by the ribs 632, 634 to prevent the containers 612 moving across the deck 616. This engagement between the containers and the pallet assists in ensuring that the containers 612 are correctly aligned with the pallet 610a. This facilitates the application of retention bands, and aids in the safety and security of stacks of containers formed above the pallet 610a.

[0047] However, the pallet 610a may also be required to support goods in soft containers such as bags or sacks. This situation is illustrated in Figs. 19a and 19b. For this purpose, the bars 620 are moved to their retracted position (Figs. 16c, 17c) as can be seen from Fig. 19. Consequently ,the deck 616 is left unobstructed by the bars 620 so that bags can be stacked onto the deck 616 (Fig. 19a) without risk of the bags or sacks 614 being punctured by features of the pallet 610a.

[0048] It will be readily understood from the above description that the task of moving the bars 620 between the projecting positions and their retracted positions is simply achieved by swinging the bars on their pivot connections, so that the pallet 610a is simply and quickly adapted for either use described above. This renders the pallet 610a versatile for both roles, allowing a single stock of pallets 610a to be used in either role, with consequent commercial advantage.

[0049] Figs. 20 to 23 illustrate an eighth embodiment of the invention. In this example, the pallet 610b has a substantially flat deck 616 which is square or rectangular and carries locating means 618b at two opposed edges, the members 618b being in the form of flaps. Each flap is connected by means of a slide and pivot arrangement to be described, allowing the flap 618b to be inverted from a final position of Figs. 20a, 21a, through an intermediate position (Figs. 20b, 21b) to a final position of Figs. 20c, 21c. The form of the flaps 618b and their manner of attachment to the pallet 610b can be seen in particular with reference to Fig. 21. Each flap 618b extends along substantially the whole edge 640 of the pallet 610b, being received in a well 642 formed in the pallet. The end walls 644 of the well 642 carry cylindrical bosses 646 which project into the well 642, generally parallel with the edge 640. The ends 648 of the flaps 618b have slots 650 formed therein for receiving respective bosses 646. The cylindrical shape of the bosses 646 allows the flaps 618b to pivot relative to the pallet 610b. The length of the slots 650 allows the flaps 618b to move with a translational motion, i.e. without rotation, relative to the pallet 610b. Consequently, a combination of sliding (translation) and rotation (pivoting) allows the flaps 618b to be inverted between the positions illustrated in Figs. 21a and 21c, moving through the intermediate position of Fig. 21b.

[0050] In both final positions, the flaps 618b are located within the well 642. In the position of Fig. 21a, the exposed surface 652 of the flap 618b carries a wall 654 around three edges. The wall is close to the extreme edges of the pallet 610b and projects above the deck 616. Consequently, the position of Fig. 21a will be referred to herein as the projecting position.

[0051] By contrast, the surface 656 which is exposed after inverting the flap 618b to the position of Fig. 21c carries no formation which projects above the deck 616 and in consequence this position will be referred herein as the retracted position.

[0052] The significance of the projecting and retracted positions can now be described in more detail, with reference to Figs. 22 and 23.

[0053] Figs. 22 and 22b illustrate the pallet 610b supporting two rigid containers 612 of the same type as described above in relation to Fig. 18. As can be seen from Fig. 22a, the containers 612 sit alongside each other on the deck 616, within a region bounded by the walls 654

of the flaps 618b at either side of the deck 616. The containers 612 lie closely alongside the walls 654 (Fig. 22b) so that any significant movement of the containers 612 across the deck 616 will be obstructed by abutment with one or other wall 654. This serves to retain the position and alignment ofthe containers 612 relative to the pallet 610b, with the consequent advantages set out above in relation to the first embodiment.

[0054] It is to be noted that in contrast with the seventh embodiment, this eighth embodiment does not engage the channels 636 in the base of the containers 612.

[0055] When the pallet 610b is to be used to support bags or sacks, the flaps 618b will be inverted to their retracted position (Figs. 20c,21c) leaving the deck 616 unobstructed by the flaps 618b and in particular unobstructed by the walls 654. Consequently, the full area of the pallet 610b can be used for stacking bags or sacks 614, as illustrated in Figs. 23a and 23b, without risk of bags or sacks 614 being split by features projecting above the deck 616.

[0056] Consequently, the pallet 610b has the versatility to be used successfully with rigid containers 612 or soft containers 614, having the advantages set out above in relation to the first embodiment.

[0057] Figs. 24 to 26 illustrate a ninth embodiment of pallet 610c. In this example, locating means 618c are provided on the deck 616 in the form of short ribs. Many ribs 618c are provided across the deck 616, as can be seen from Fig. 24a. Some ribs lie along the edges of the pallet 610c. Other ribs are located closer to the centre of the deck 616. The significance of these various locations will become apparent below.

[0058] Figs. 26a and 27a illustrate the ribs 618c projecting above the deck 616. Alternatively, the ribs 618c can be moved to a retracted position (Fig. 25b), within the deck 616, by means of an arrangement illustrated schematically in Fig. 25c. In more detail, each rib 618c is housed in a well 660 formed in the deck 616. The rib 618c is free to slide into and out of the well 660, having a position in which the rib 618c projects out of the well 660 above the deck 616, and referred to herein as the projecting position. Alternatively, the rib 618c can slide down into the well 660 to have its uppermost surface flush with the deck 616, or deeper within the well 660, a position referred to herein as the retracted position. A compression spring 662 is provided within the well 660 to urge the rib 618c to adopt the projecting position unless the spring bias is overcome. Engagement between the ribs 618c and the walls of the well 660, such as guide lugs and guide slots, may be provided to assist in smooth movement of the rib 618c.

[0059] Each of the ribs 618c is mounted in the pallet 610c in the manner just described. Consequently, the situations illustrated in Figs. 25b and 26a will not in fact arise in practice, because the springs 662 will push the ribs 618c to the projecting positions (Figs. 24a and 25a). Figs. 25b and 26a are incorporated in order to assist in understanding the construction and function of this embodiment.

[0060] Fig. 24b illustrates the pallet 610c in use with two rigid containers 612 of the type described above. These containers 612 are resting on the deck 616 alongside one another, within a region defined by the outermost lines of ribs 618c. The containers 612 will therefore abut these outermost ribs 618c and their movement across the deck 616 is therefore obstructed by the presence of the ribs 618c. The ribs 618c are preferably shaped so that any cam action which arises between a container 612 and a rib 618c is not sufficient to overcome the bias of the spring 662 in the event container 612 begins to move across the deck 616. The location and alignment of the containers 612 is therefore controlled relative to the pallet 610c, with the advantages set out above.

[0061] While sitting within the outermost ribs 618c, the containers 612 sit over other ribs 618c, located more centrally on the deck 616. Some of these other ribs 618c may be positioned and oriented to remain projecting above the deck 616 in order to engage in the channels 638 to further assist in obstructing movement of the containers 612 across the deck 616, or between adjacent containers.

[0062] Any ribs 618c which are at positions which would prevent the container 612 being lowered onto the deck 616 will be pressed down by the weight of the container, against the bias of the spring 662, so that those particular ribs 618c play no part in obstructing the movement of the containers 612.

[0063] In addition to supporting rigid containers 612, the pallet 610c might alternatively be required for supporting soft containers, such as bags, or sacks 614. This use is illustrated in Fig. 26b. As can be seen, bags or sacks 614 are placed across substantially the whole area of the pallet 610c, including the locations of the ribs 618c. The weight of the bags or sacks 614 and their contents, will press the ribs 618c down to their retracted positions so that they leave the deck 616 unobstructed, being in the positions illustrated in Fig. 26a. Consequently, the bags or sacks 614 can safely be stacked on the pallet 610c without danger of being ruptured by upstanding features of the pallet 610c.

[0064] In consequence, the pallet 610c again has the versatility for use either with rigid containers 612 or soft containers 614, providing the economic and other benefits set out above.

[0065] It is apparent from the above description that in each of the embodiments, the deck 616 between the regions of the locating means 618a, b, c is preferably substantially without projections above the generally planar upper surface. However, recesses may be provided in the surface of the deck 616. For example, and as illustrated by a tenth embodiment shown in Fig. 27, the deck 616 may have grooves or slots 670, positioned to receive downwardly projecting ribs 672 on a container 674, engaging the ribs and thereby obstructing movement of the container across the deck 616. The slots

670 will not interfere with bags or sacks resting on the deck 616, and are preferably sufficiently narrow to avoid product falling into the slots.

[0066] Fig. 27 is highly schematic, showing three features which can be provided in various combinations and at various positions across the deck 616, in a pallet 610d. Thus, a rib 618c, shown to the left in Fig. 27 and retractably mounted as described above in relation to the ninth embodiment, is shown projecting above the deck 616, to engage a channel 676 in the base of the container 674. A second rib 618c illustrated to the right in Fig. 27, is shown depressed into the deck 616, as will be the effect of the weight of the container 674. A rib 672 is shown aligned with a slot 670, to enter the slot 670 as the container 674 is lowered onto the deck 616. The container 674 is shown spaced slightly above the deck 616 in Fig. 27, for clarity.

[0067] Grooves or slots of the type described in relation to Fig. 27 could also be incorporated in the other embodiments described above.

[0068] The invention (including each of the embodiments) can readily be incorporated into a pallet without wheels (pallet, stillage etc.), or a wheeled pallet (dolly).

[0069] Various modifications can be made to the apparatus described above, without departing from the scope ofthe present invention. Many different dimensions and relative dimensions of the pallets and components can be used, designed in accordance with the containers or range of containers with which the pallets are intended to be used. Many different manufacturing materials may be used, but it is envisaged that the pallets can be constructed wholly or primarily from synthetic plastics materials, such as by injection moulding.

[0070] Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

Claims

1. A pallet including a deck having a load bearing surface and at least one locating means, said locating means being adjustable between a first position in which the locating means extends above the deck to engage and limit movement of articles placed on the deck, and a second position in which the locating means is located at or below the load bearing surface of the deck, such that the deck is substantially unobstructed.

2. A pallet according to claim 1, having a plurality of locating means distributed across the deck.

3. A pallet according to claim 1 or claim 2, wherein the or each locating means is complementary in shape to features of articles to be placed on the deck.

4. A pallet according to any one of the preceding claims, wherein the or each locating means is pivotably attached to the deck.

5. A pallet according to claim 4, wherein the or each locating means is an elongate member that is pivotably attached to the deck at each end of the elongate member.

6. A pallet according to claim 5, in which the or each locating means is pivotable between a first position in which it extends above the deck, and a second position in which it is located at or below the load bearing surface of the deck.

7. A pallet according to claim 6, in which the or each locating means rests on the deck when located in said first position.

8. A pallet according to claim 6 or claim 7, in which the or each locating means is accommodated within a recess in the deck when located in said first position.

9. A pallet according to any one of claims 5 to 8, in which the or each locating means is accommodated within a recess in the deck when located in said second position.

10. A pallet according to any one of claims 5 to 9, in which the or each locating means includes end stop members.

11. A pallet according to claim 10, in which the end stop members rest on the deck when the or each locating means is located in said first position.

12. A pallet according to claim 10 or claim 11, in which the end stop members are accommodated within corresponding recesses in the deck when located in said second position.

13. A pallet according to any one of the preceding claims, in which the or each locating means includes at least one stop member for engaging a side of an article to be carried by the pallet, each said stop member being adjustable between a first position in which it extends above the deck, and a second position in which it is located at or below the load bearing surface of the deck.

14. A pallet according to claim 13, in which the or each stop member is accommodated within a recess in an end edge of the pallet when located in said sec-

ond position.

15. A pallet according to claim 13 or claim 14, in which the or each stop member is mounted for pivoting and/or sliding movement between said first and second positions.

16. A pallet according to any one of claims 13 to 15, in which the or each stop member is resiliently biassed towards said first position.

17. A pallet according to claim 16, in which the or each stop member will retract under the weight of an article placed on the deck.

18. A pallet according to any one of the preceding claims, in which the load bearing surface of the deck is substantially planar.

19. A pallet according to any one of the preceding claims, including a supporting structure that, in use, supports the deck above the ground.

20. A pallet according to any one of the preceding claims, including wheels or rollers.

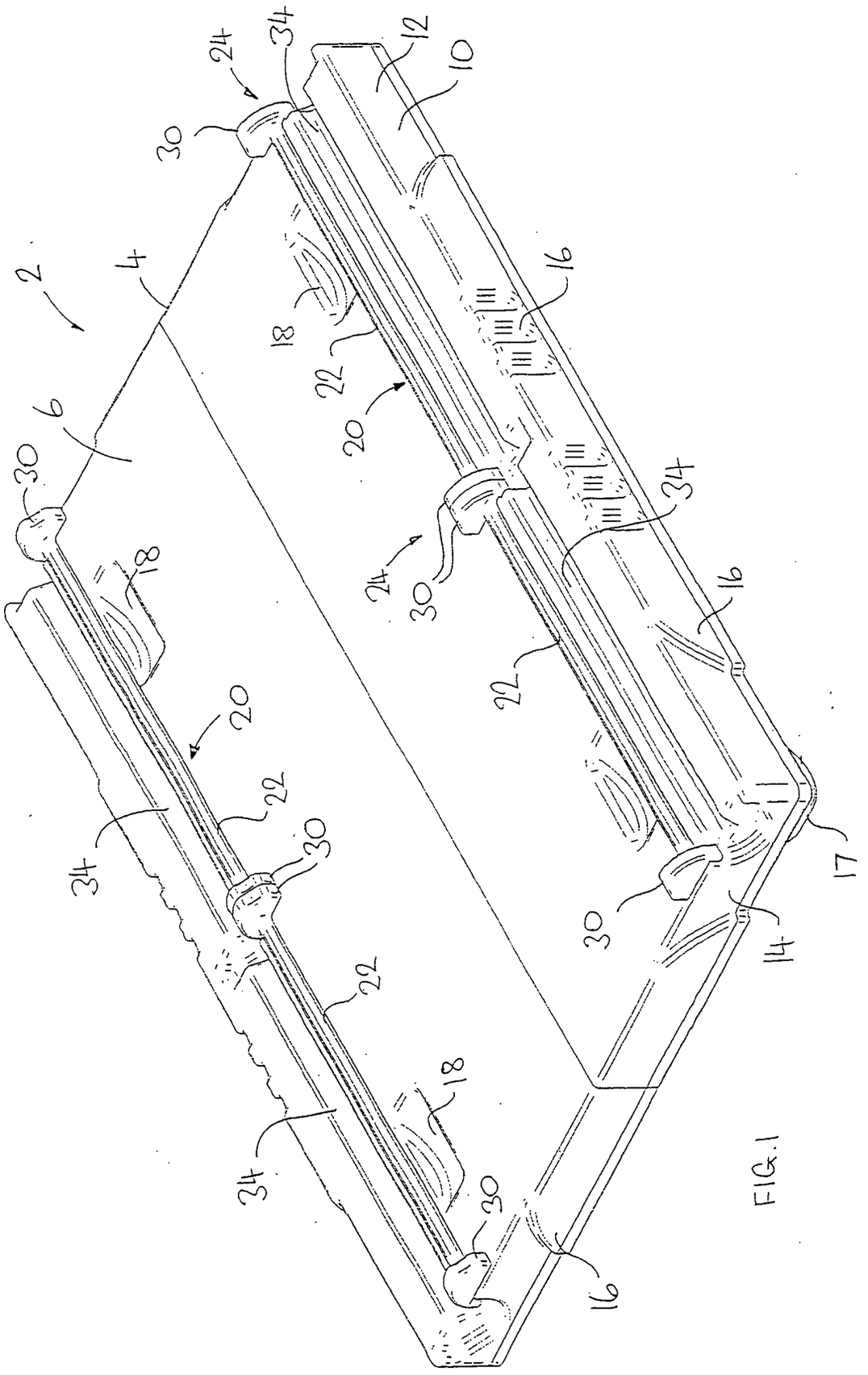


FIG. 1

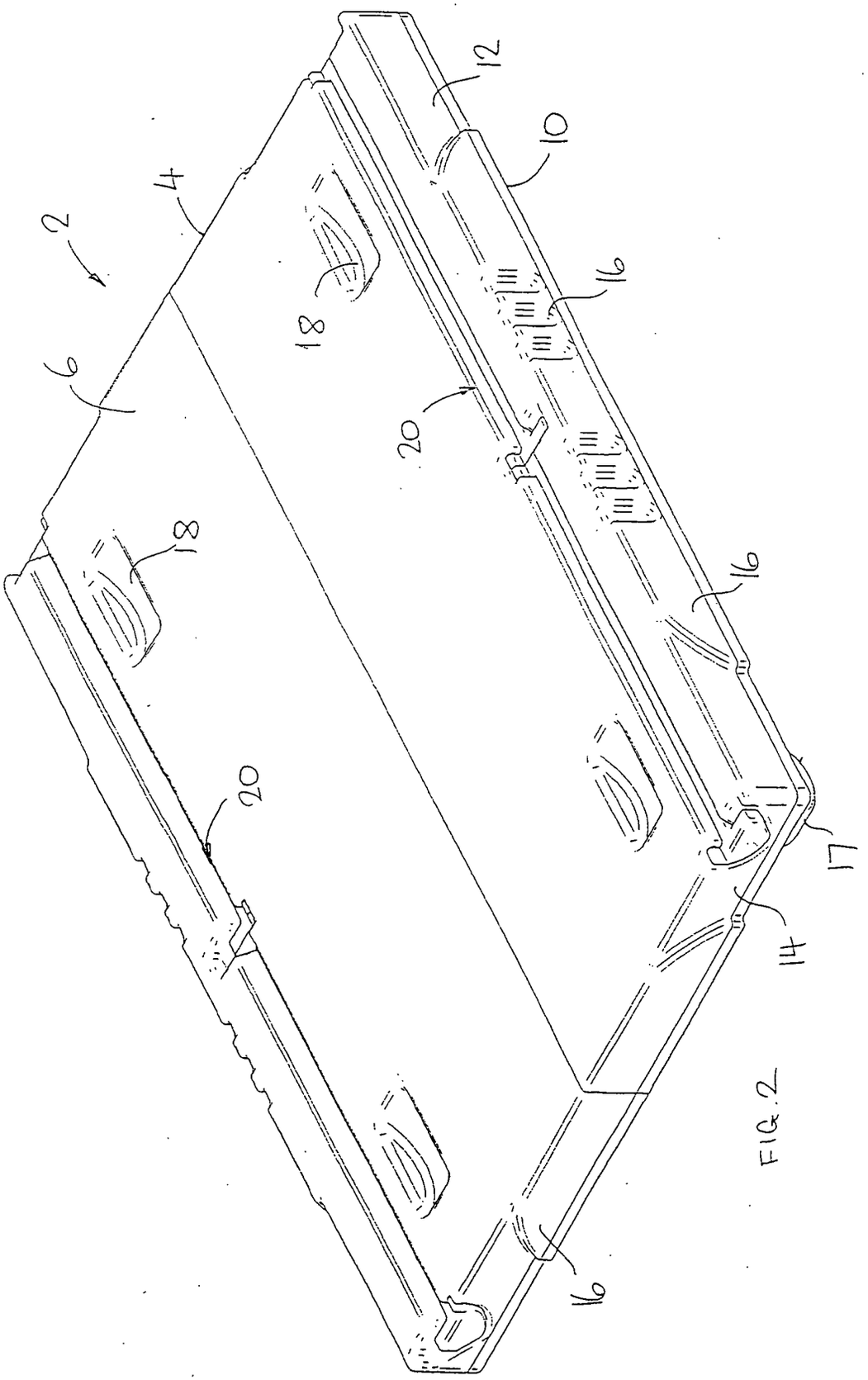


FIG. 2

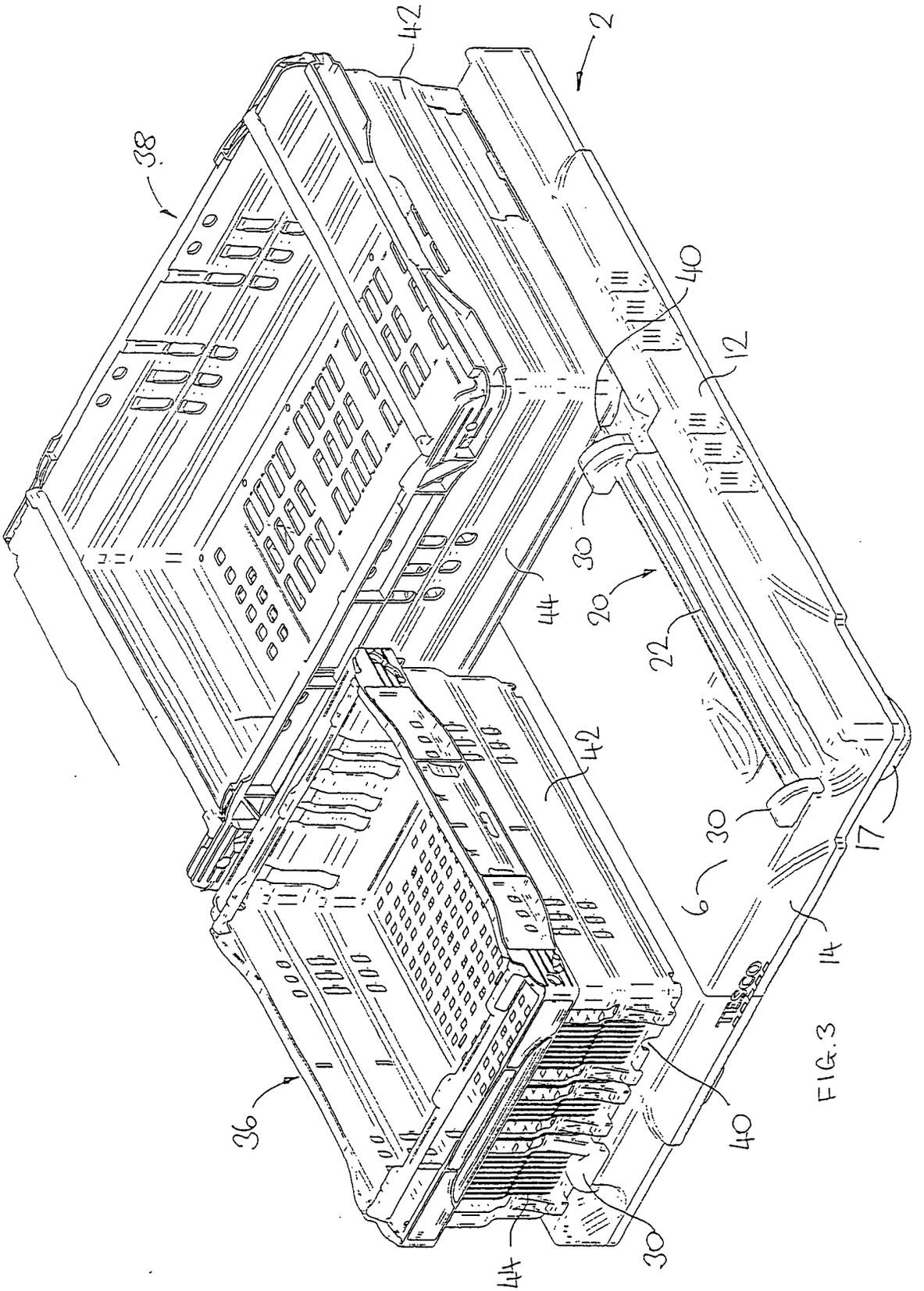


FIG.3

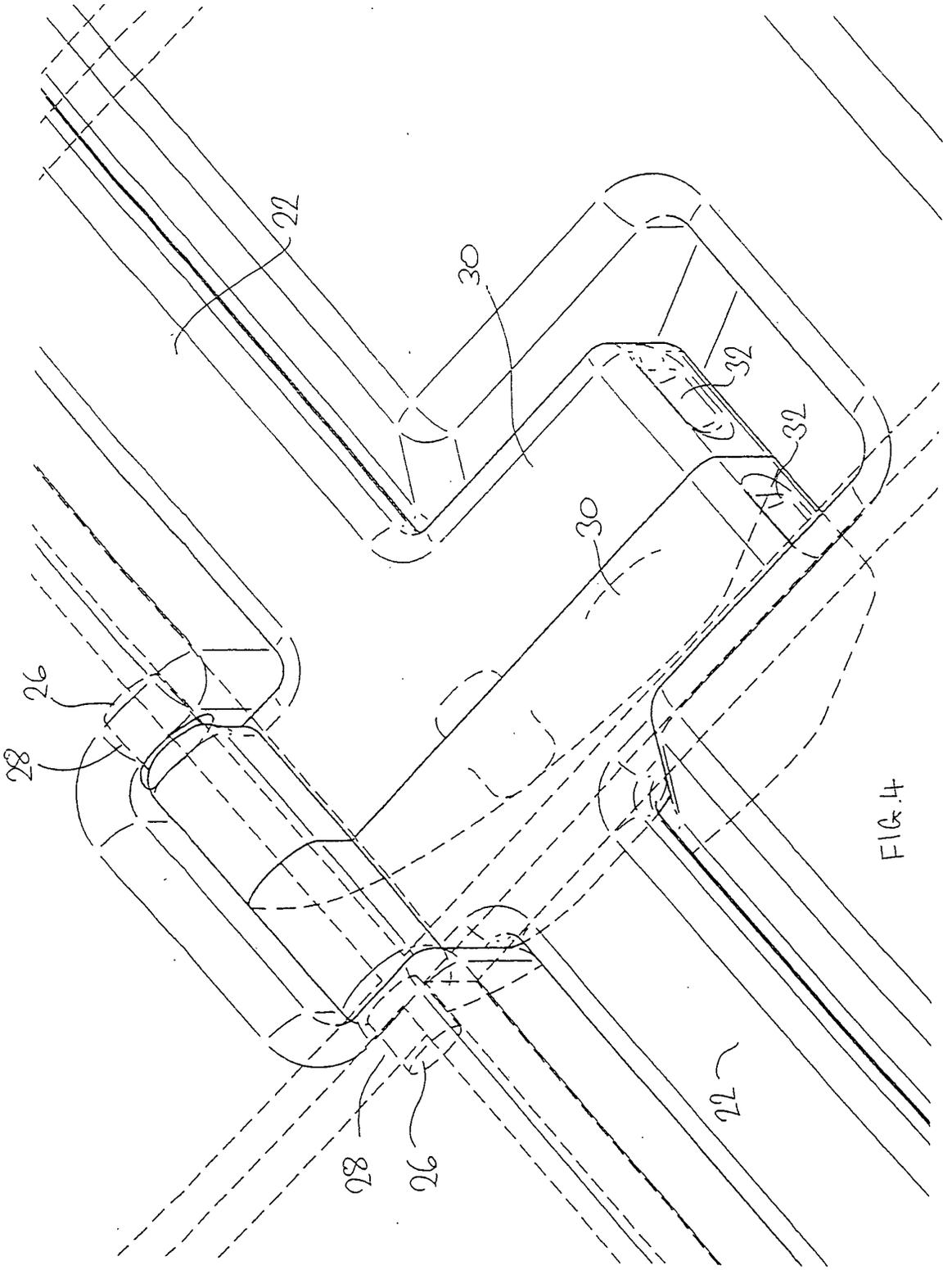


FIG. 4

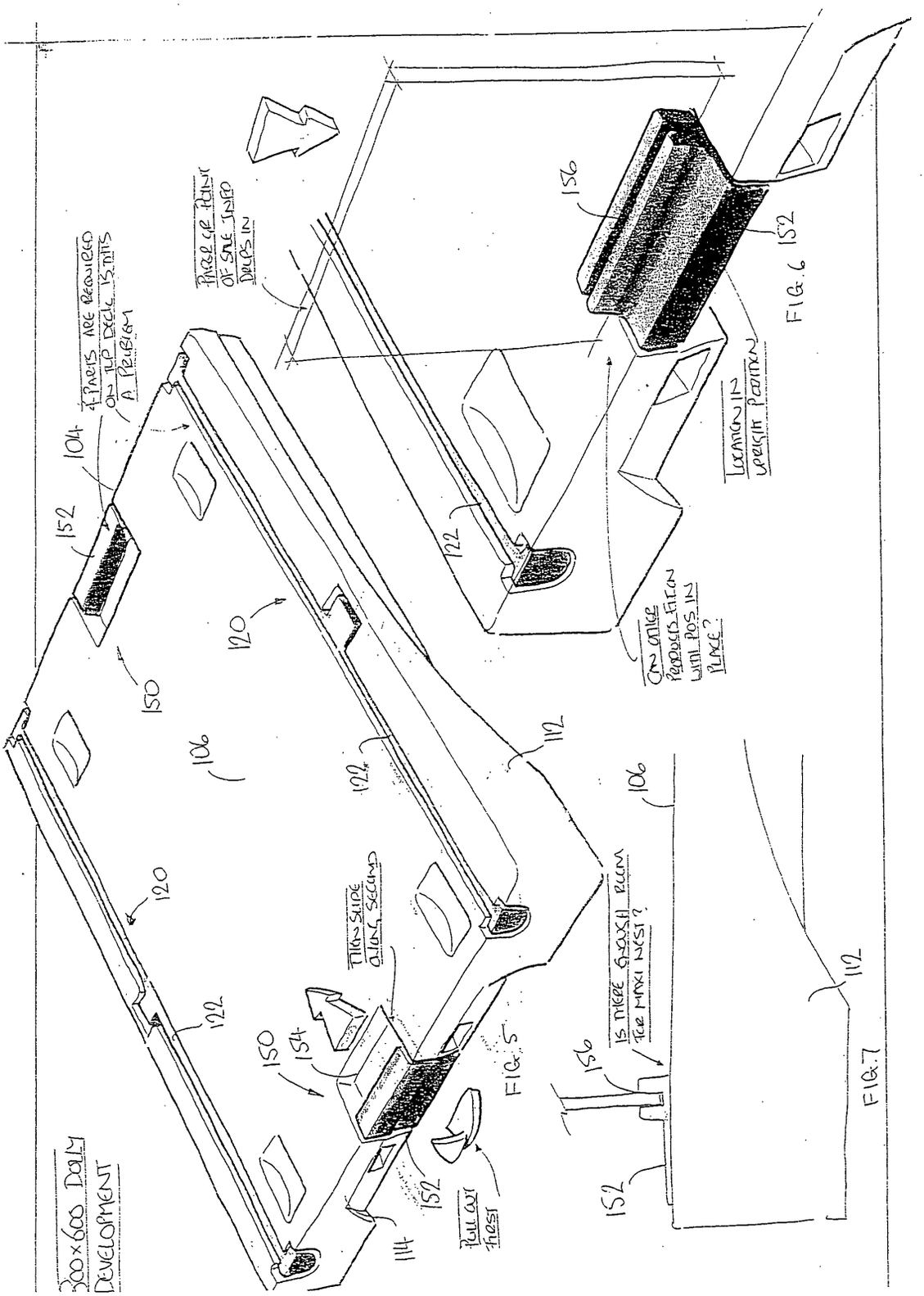
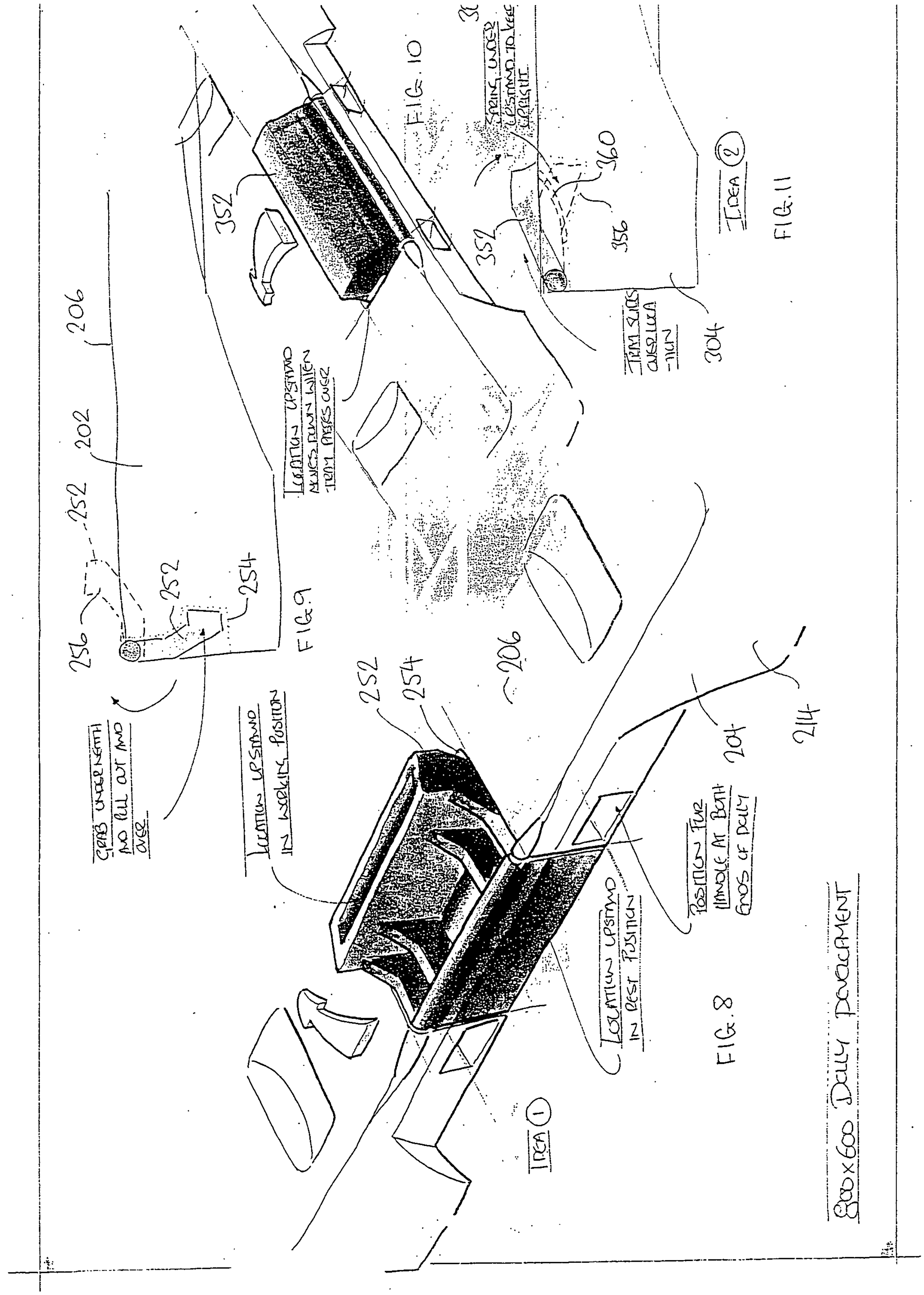
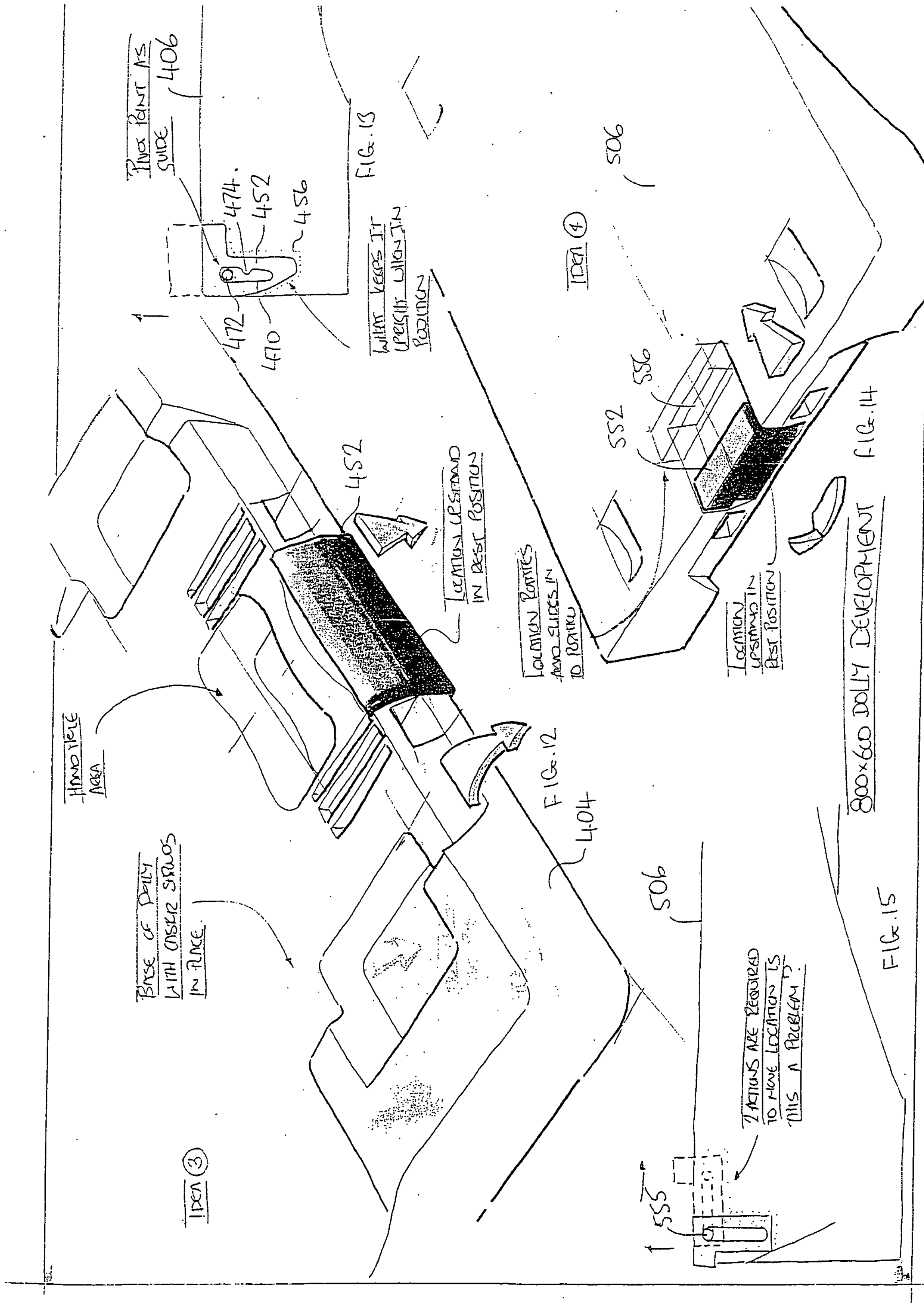


FIG. 5

FIG. 6

FIG. 7


800 x 600 DOLLY DEVELOPMENT
IDEA 1
IDEA 2
FIG. 8
FIG. 9
FIG. 10
FIG. 11
LOCATION UPSTAND IN WORKING POSITION
LOCATION UPSTAND IN REST POSITION
POSITION FOR HANDLE AT BOTH ENDS OF DOLLY
GRAB UNDERNEATH AND PULL OUT AND OVER
LOCATION UPSTAND MOVES DOWN WHEN TRIM PASSES OVER
SPRING UNDER UPSTAND TO KEEP UPRIGHT
TRIM SLIDES OVER LOCATION
202
204
206
214
252
254
256
304
352
356
360


PIVOT POINT AS GUIDE
406
474
452
456
472
470
FIG.13
WHAT KEEPS IT UPRIGHT WHEN IN POSITION
IDEA 4
506
556
552
FIG.14
LOCATION UPSTAND IN REST POSITION
800×600 DOLLY DEVELOPMENT
452
LOCATION UPSTAND IN REST POSITION
LOCATION ROTATES AND SLIDES IN TO POSITION
HANDHOLE AREA
FIG.12
404
BASE OF DOLLY WITH CASTER SHROUDS IN PLACE
506
FIG.15
2 ACTIONS ARE REQUIRED TO MOVE LOCATION IS THIS A PROBLEM?
555
IDEA 3

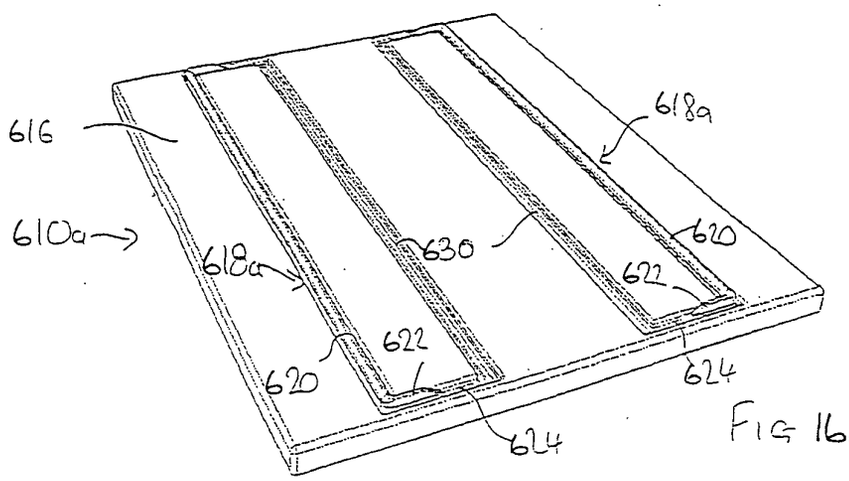


Fig 16a

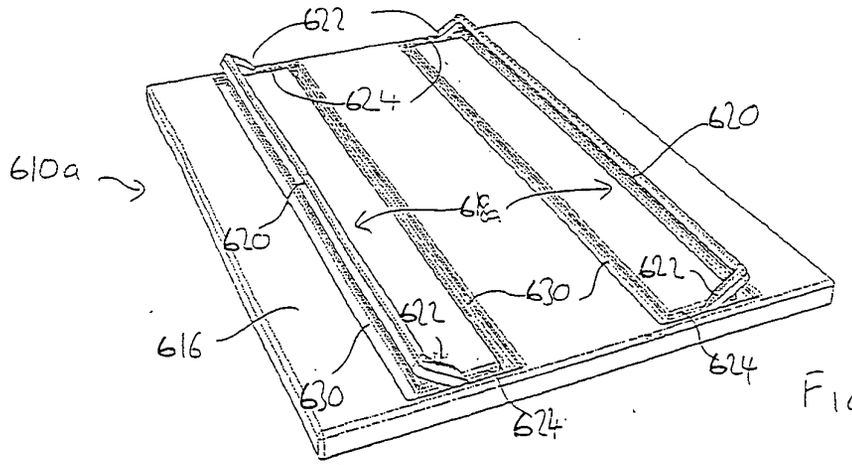


Fig 16b

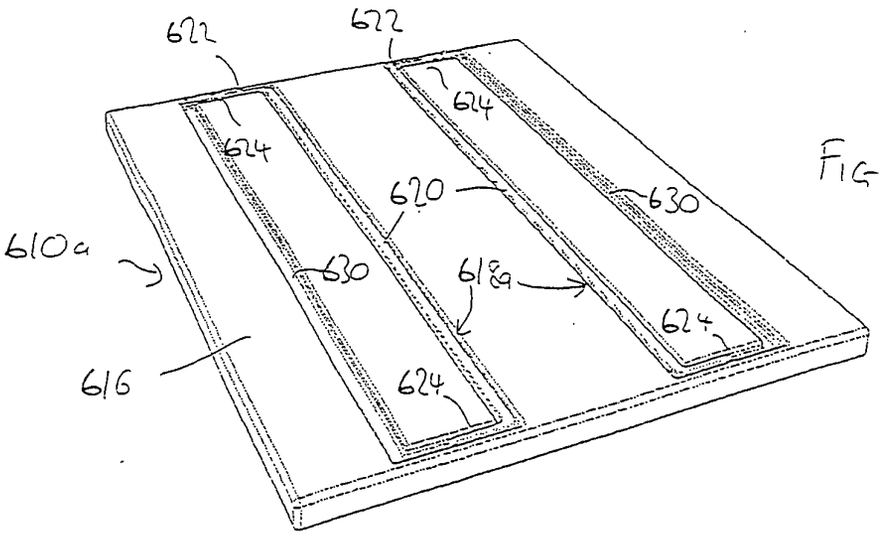


Fig 16c

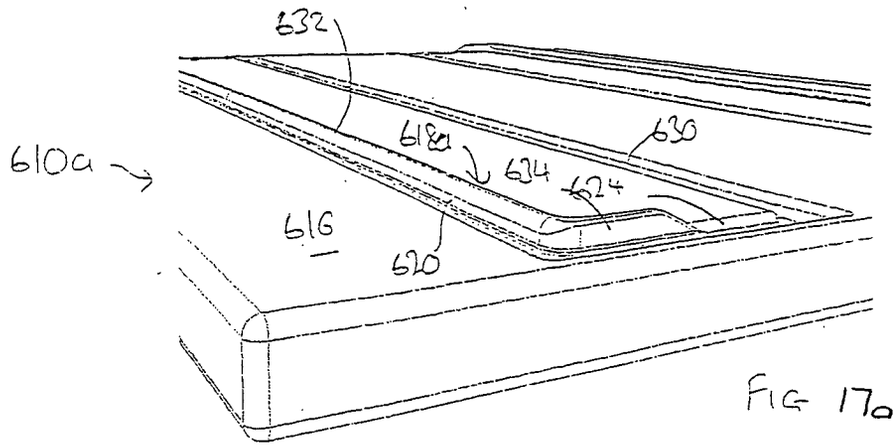


FIG 17a

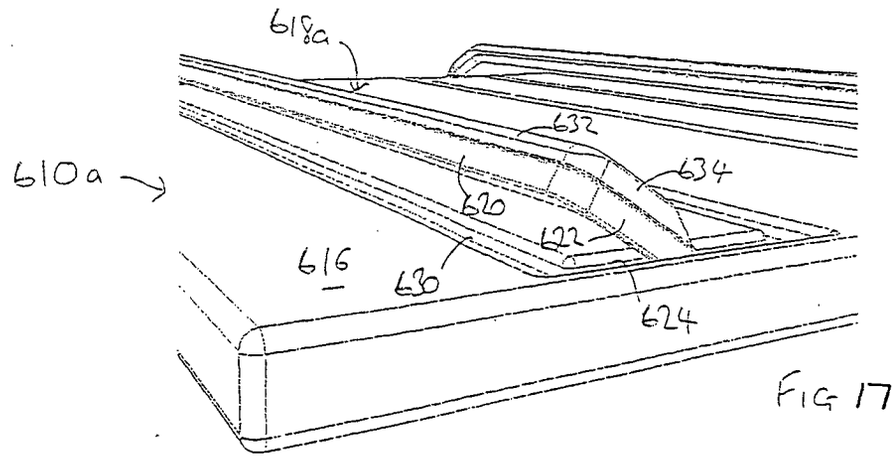
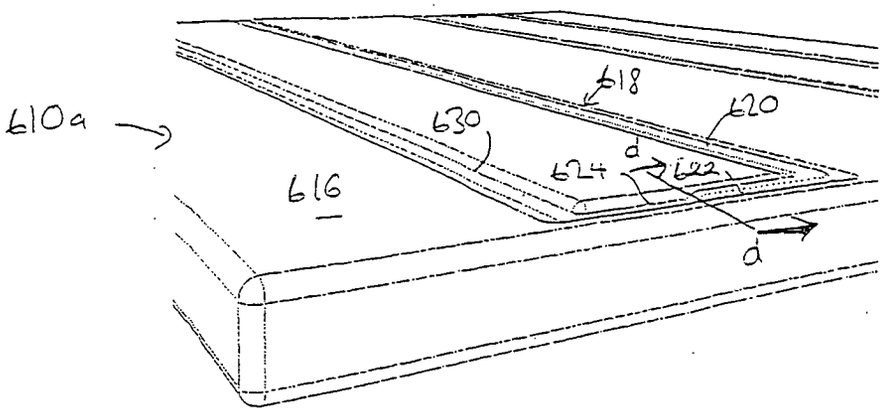


FIG 17b

FIG 17c



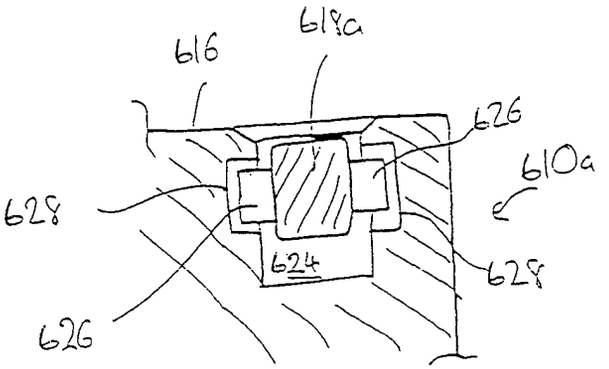


FIG 17d

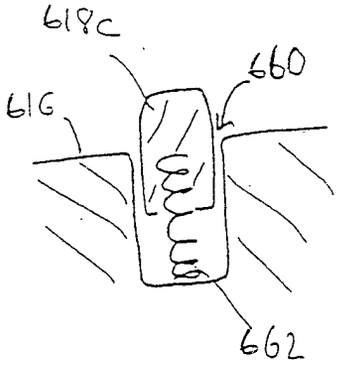


FIG 25c

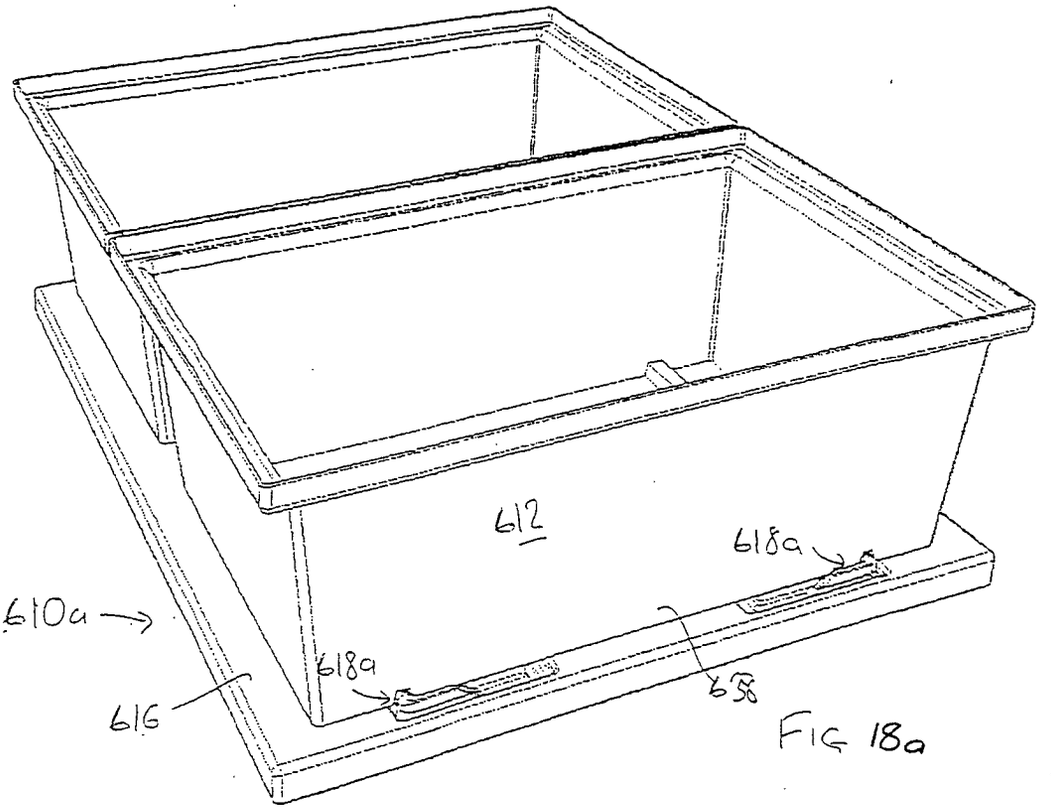


FIG 18a

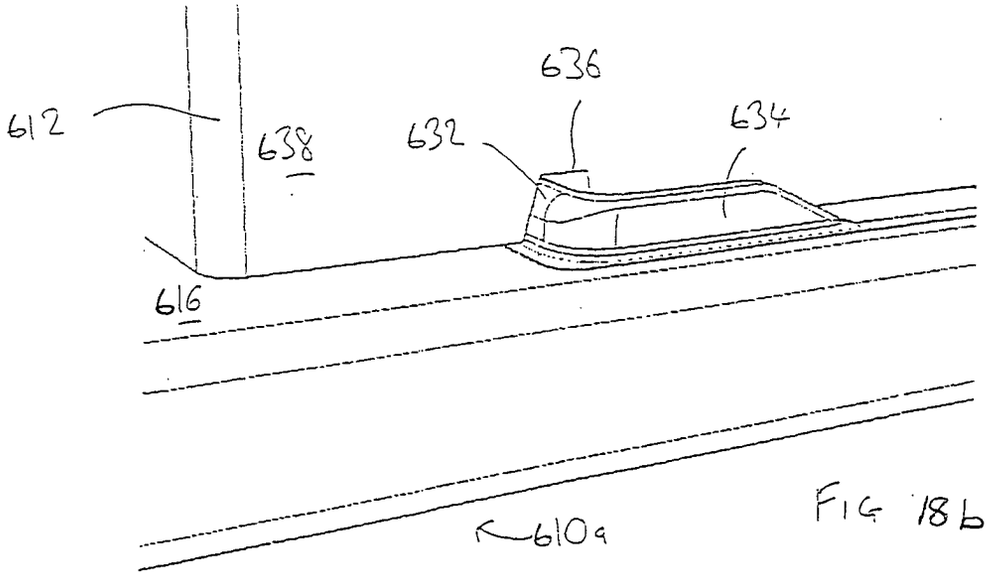


FIG 18b

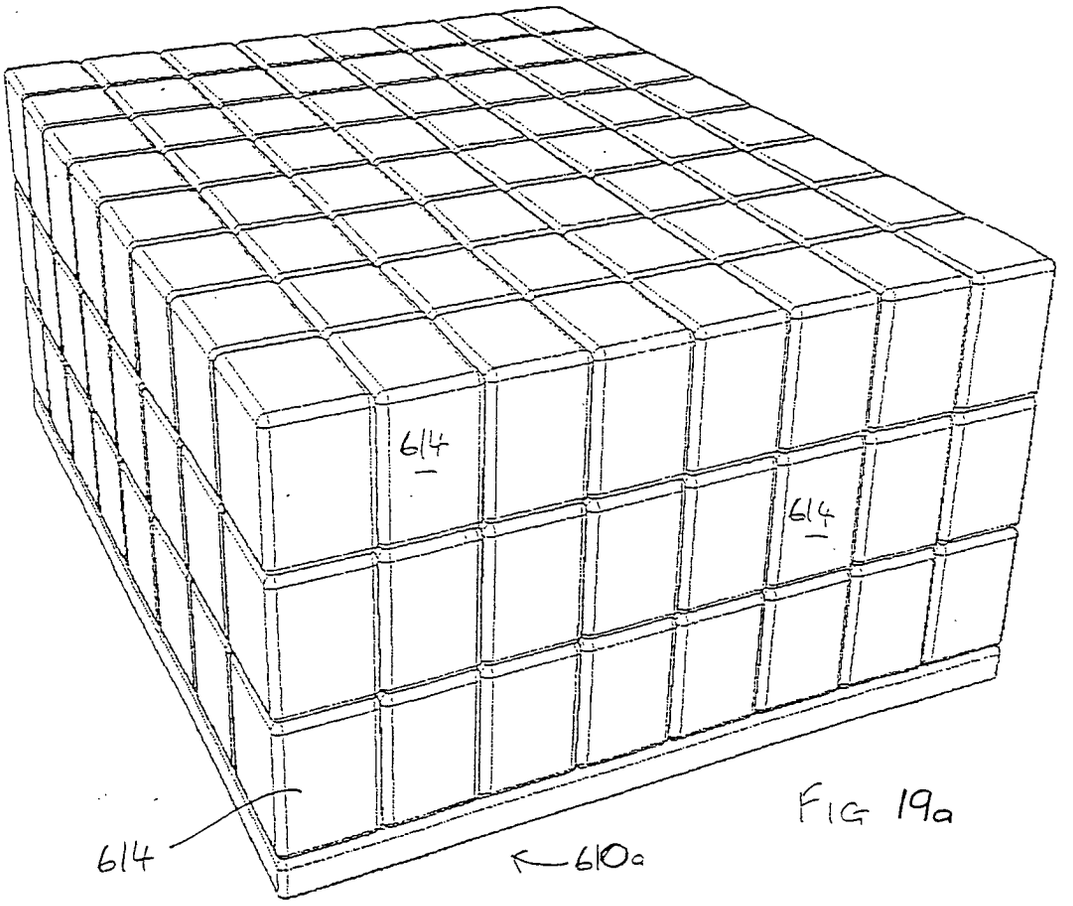


FIG 19a

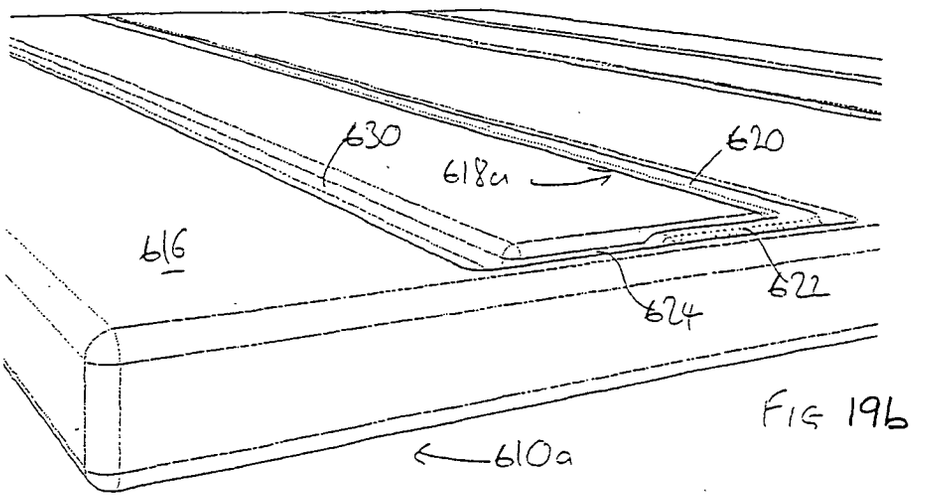


FIG 19b

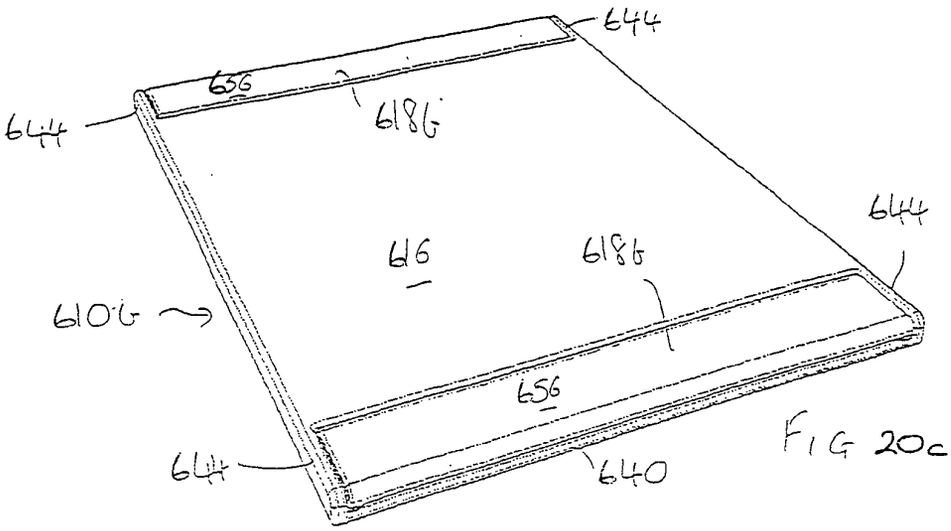


FIG 20c

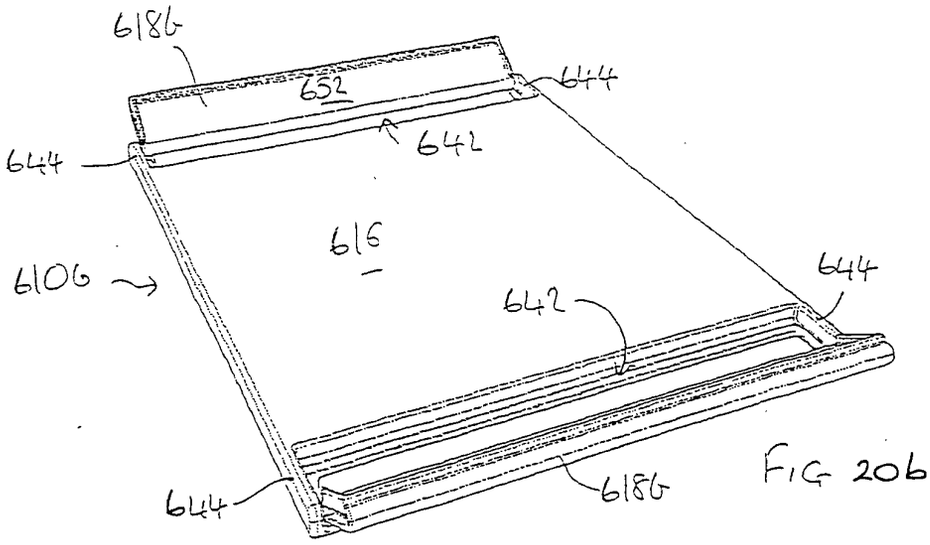


FIG 20b

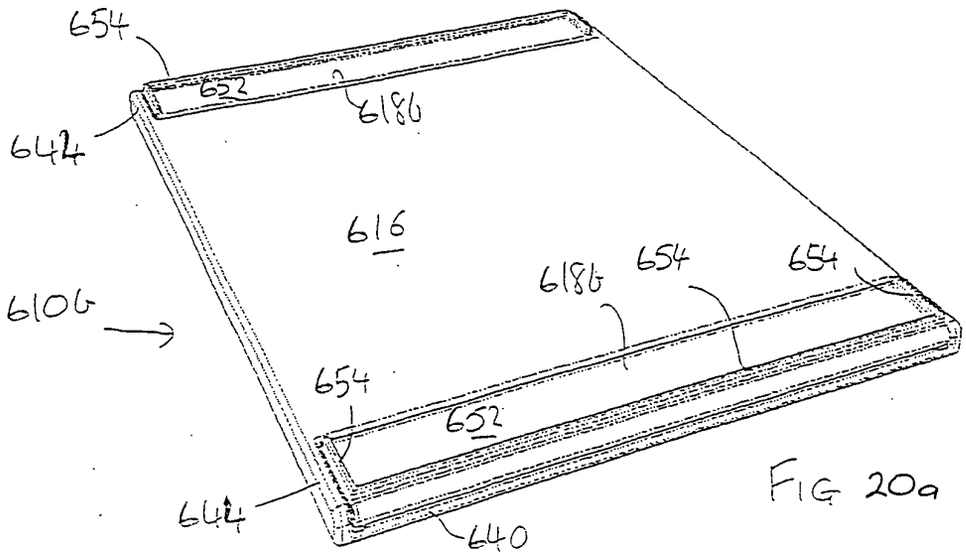


FIG 20a

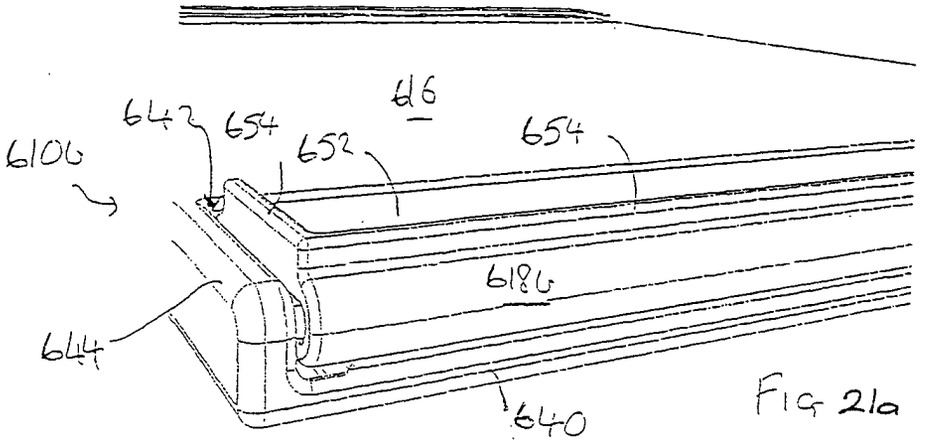


FIG 21a

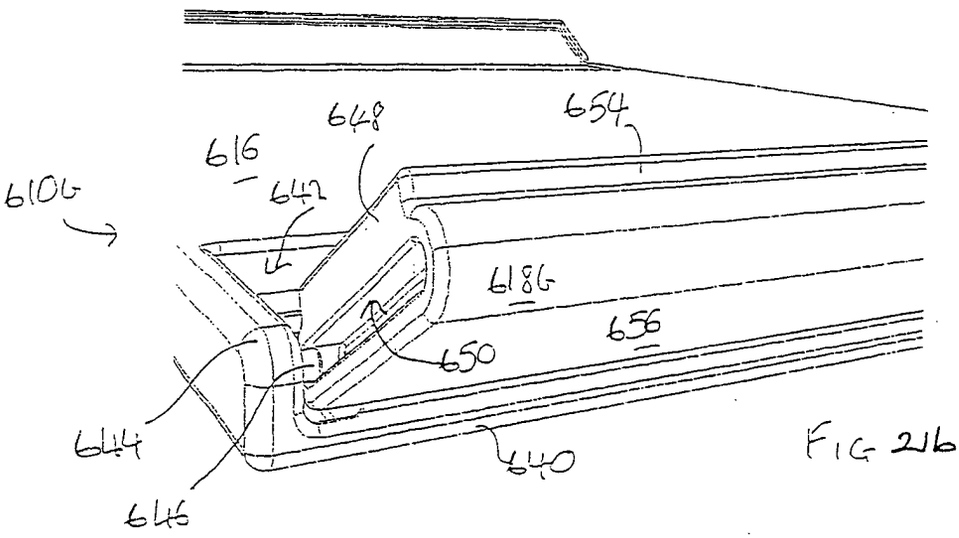
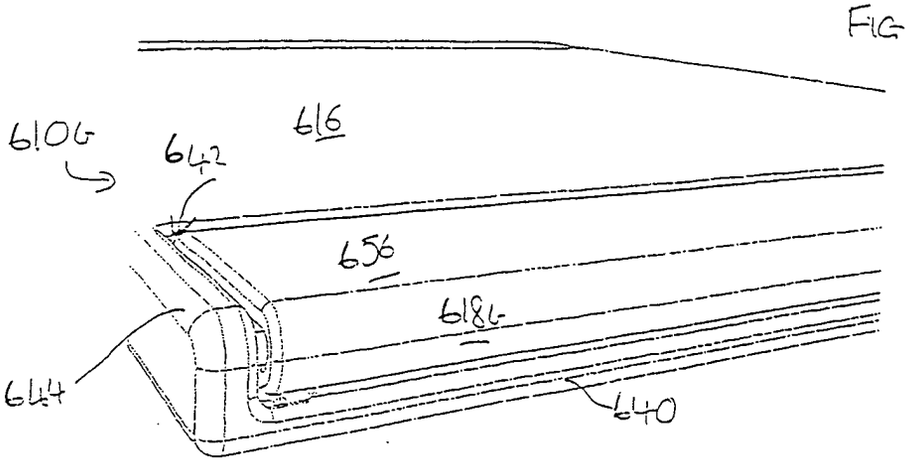


FIG 21b

FIG 21c



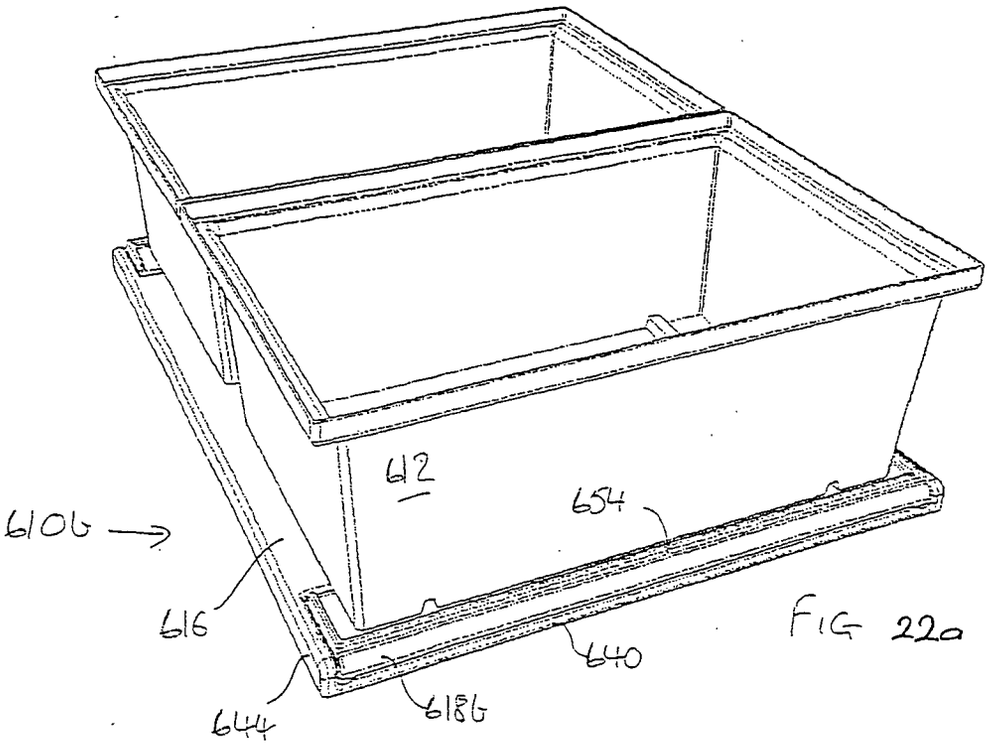


FIG 22a

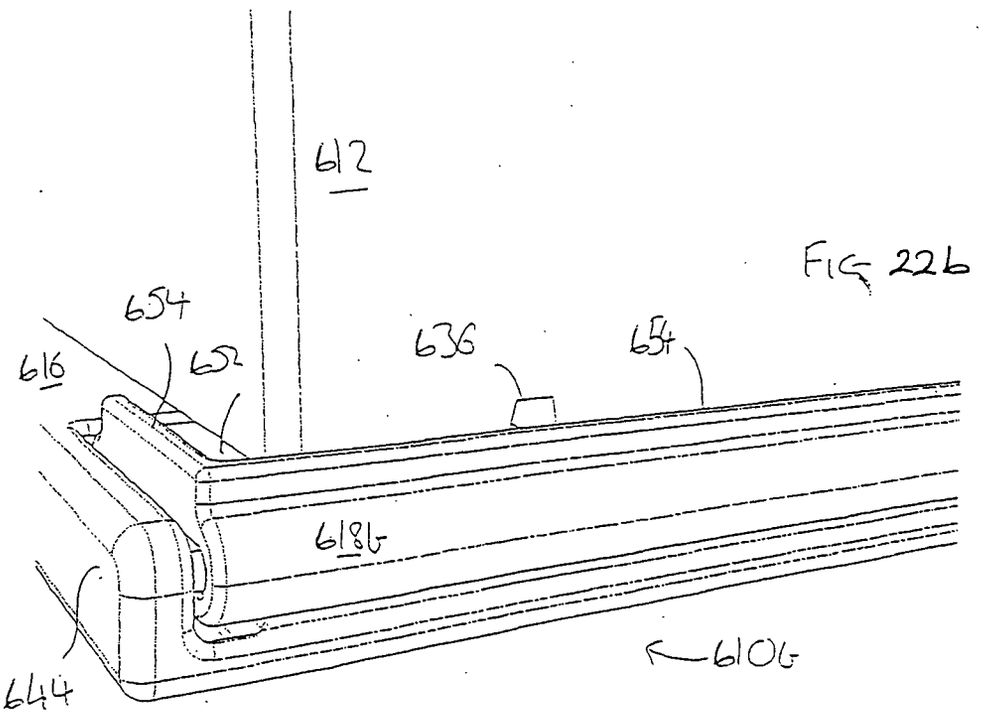


FIG 22b

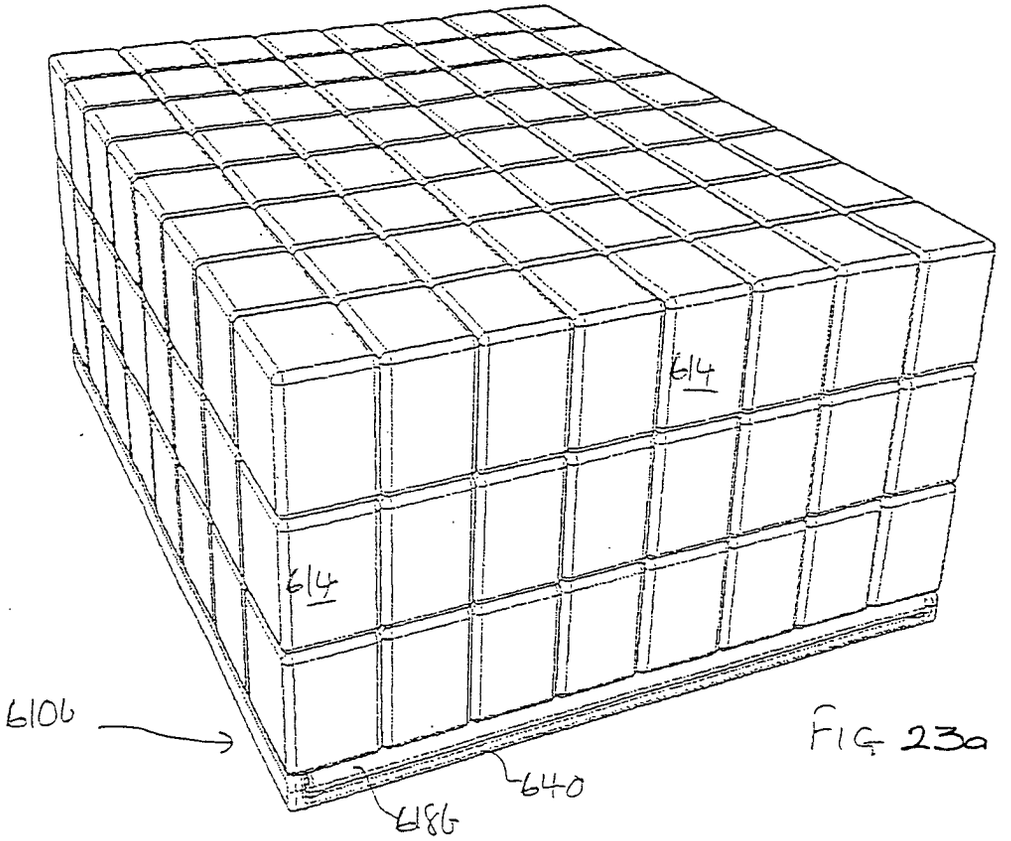


FIG 23a

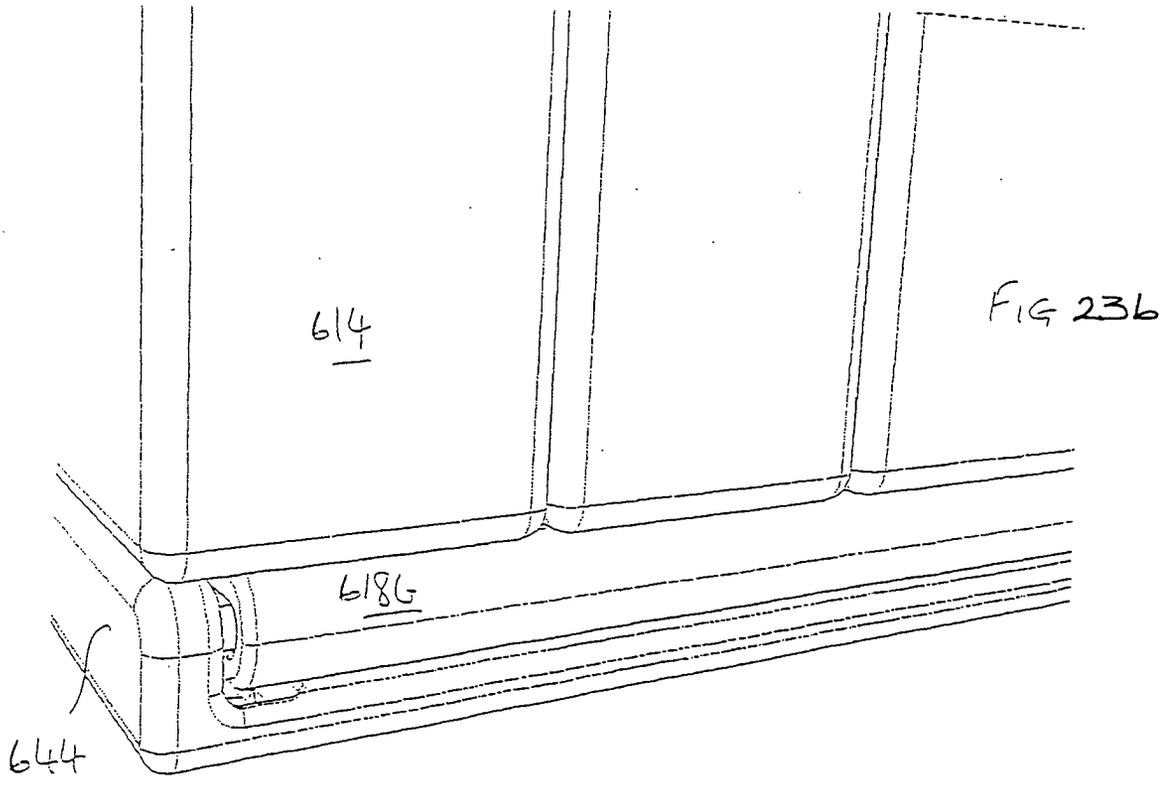


FIG 23b

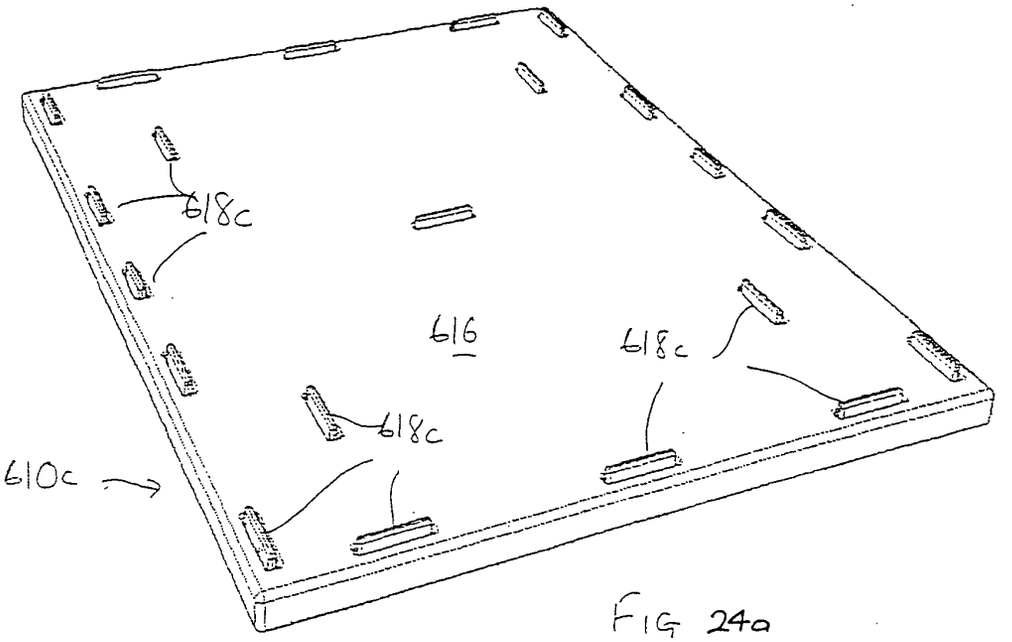


FIG 24a

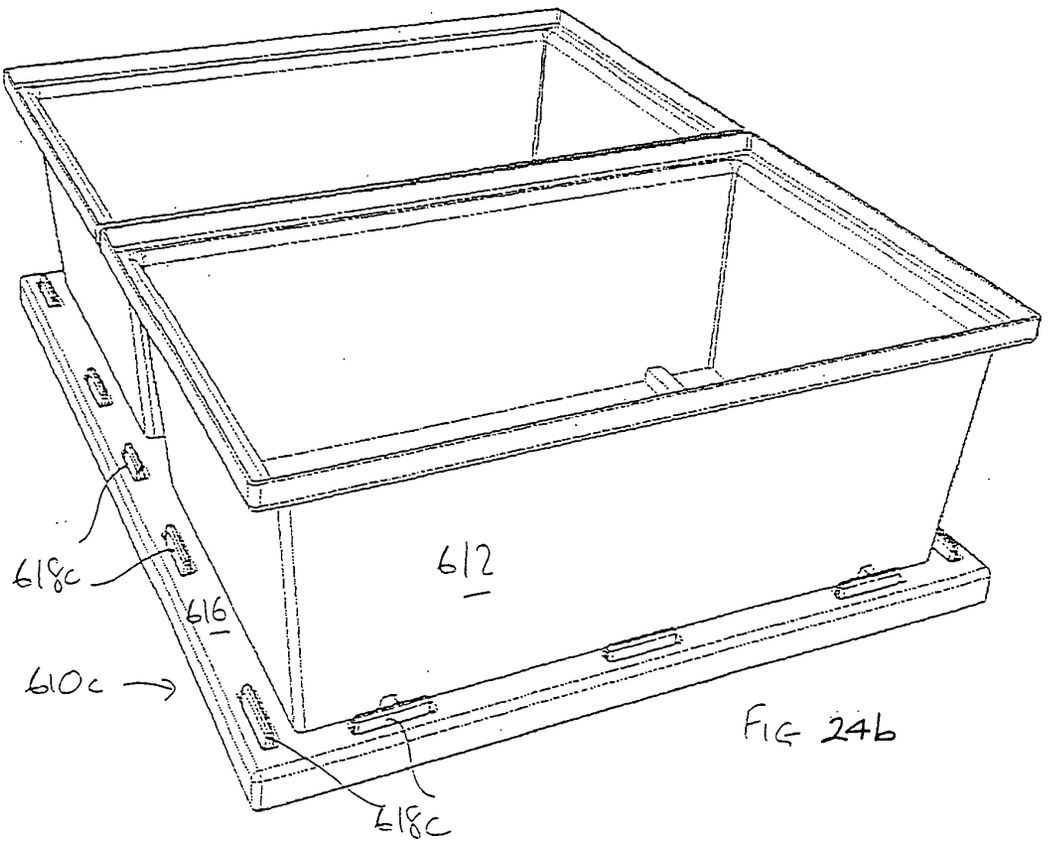


FIG 24b

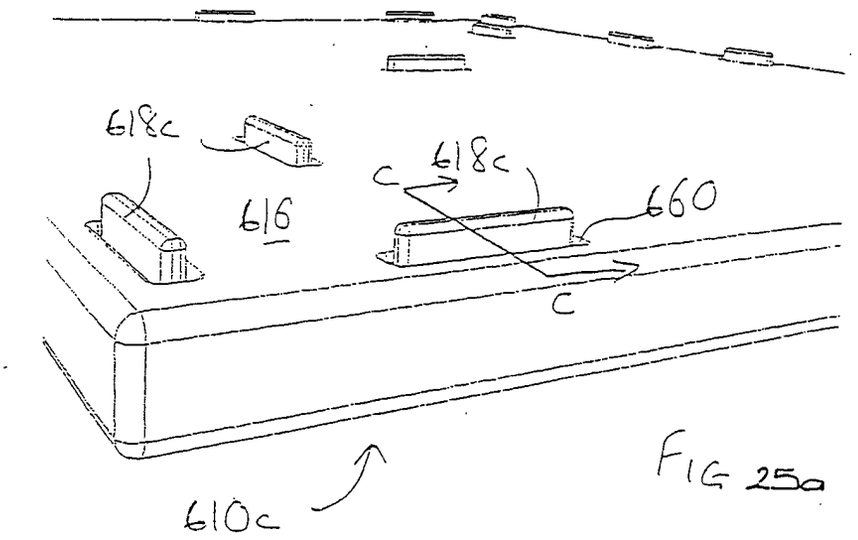


FIG 25a

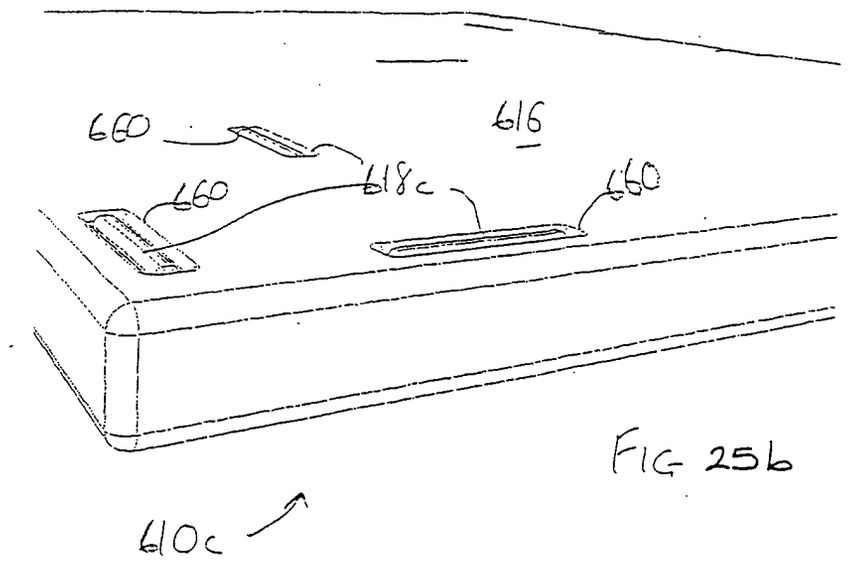


FIG 25b

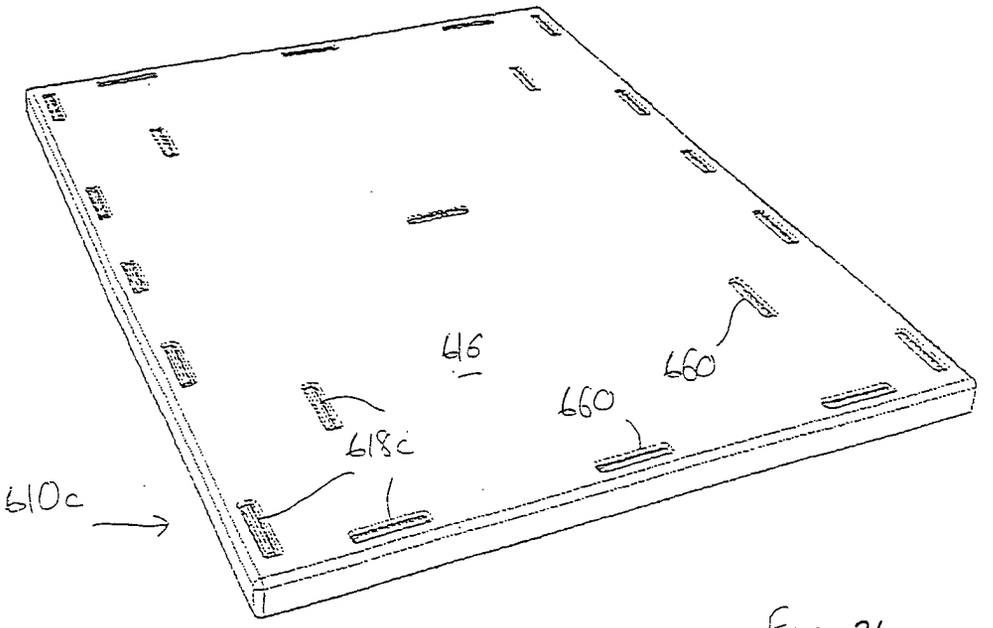


FIG 26a

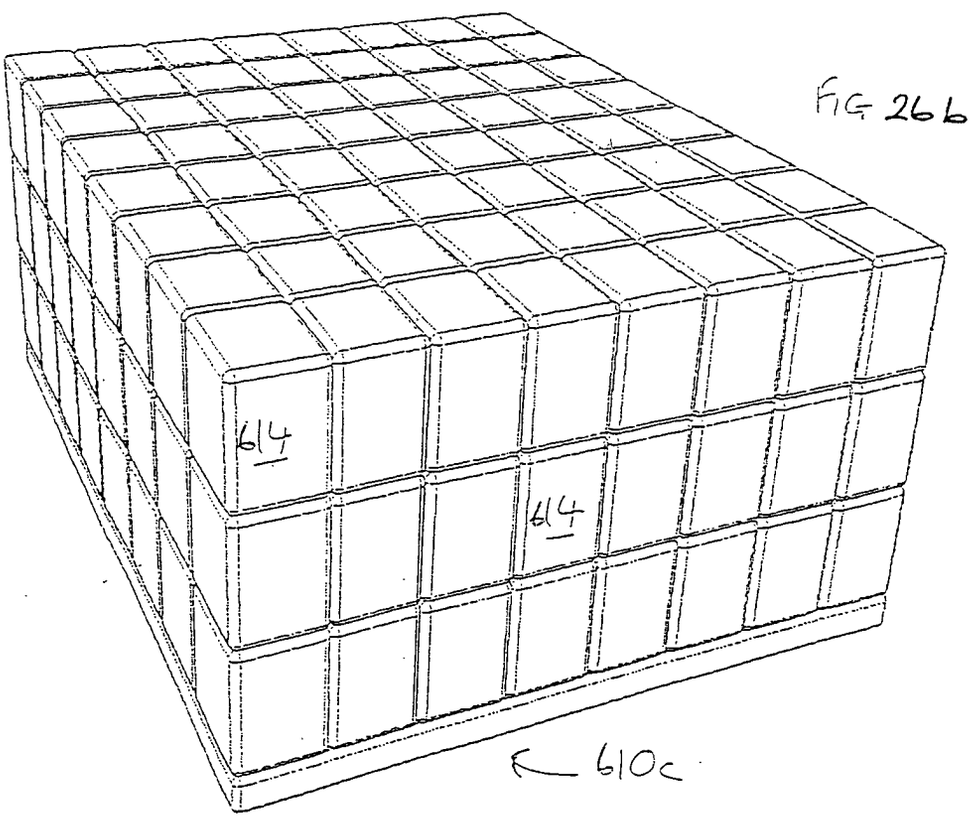


FIG 26b

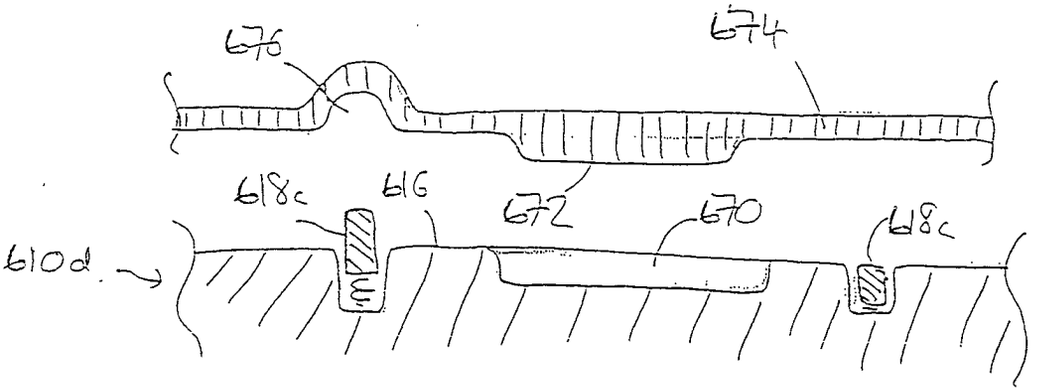


FIG 27