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(54) **Interlockable trays**

(57) A tray (2; 24) is provided which is capable of engagement with at least a second tray (26). Each tray comprises a cavity (4) for the placement of a foodstuff therein and has first and second engagement means (16, 18; 16', 18') provided at spaced apart locations along an edge of the tray to allow mutual engagement of the trays (2; 24, 26). An indent portion (13) is provided along the edge of each tray between the first and second

engagement means (16, 18; 16', 18'), such that when the trays are brought into mutual engagement, the first engagement means (16) of the first tray (2; 24) can be provided over and engaged with the second engagement means (18') of the second tray (26), and the first engagement means (16') of the second tray (26) can be provided over and engaged with the second engagement means (18) of the first tray (2; 24).

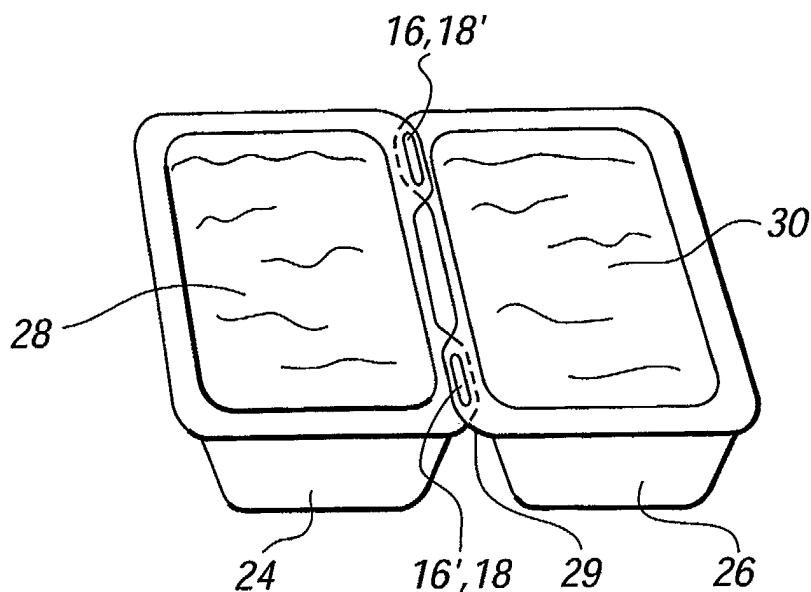


FIG. 4

Description

[0001] The invention to which this application relates is to packaging, and particularly to packaging in the form of trays for containing a number of products, said products typically being foodstuffs.

[0002] The provision of foodstuffs in a ready-cooked or easy-cook condition as a retail pack is well known. The foodstuffs can be provided in chilled or frozen conditions, or may simply be fresh and typically require only reheating or a relatively simple cooking operation before the foodstuff is ready for consumption.

[0003] Conventional trays can be manufactured from any suitable material such as, for example, plastics material, in which material is formed into the required shape, and a tray typically comprises a cavity or recessed portion in which foodstuff is located. The cavity or recess portion is typically surrounded by a lip or flange which allows the tray to be gripped and also allows engagement of sealing material over the opening of the cavity or recessed portion. The tray may also be provided with a cardboard sleeve upon which printed material can be carried to provide information relating to the foodstuff(s) contained therein. Conventionally, when the tray is purchased, in order to cook or heat the foodstuff contained therein, the sleeve surrounding the tray is removed. The sealing material provided over the opening of the cavity is removed or pierced and the tray is placed in a microwave or oven for cooking as appropriate. Once the foodstuff has been cooked or heated, the foodstuff is either eaten directly from the tray or removed from the tray onto a plate, bowl or the like for consumption, with the tray being discarded as waste.

[0004] Conventional trays can also comprise one or a number of compartments for containing one or a number of different foodstuffs. A problem encountered with such trays is that different foodstuffs contained in different compartments may require to be cooked for different periods of time. Conventionally this has led to a compromise in the cooking time for the different foodstuffs or, alternatively, one of the foodstuffs has to be removed from a compartment and cooked separately.

[0005] In order to avoid this problem it is known to provide multi-packs of foodstuffs comprising different foodstuffs in separate trays, the foodstuff in each tray being heated for the required period of time. Once each of the foodstuffs are cooked they can be joined together to form a meal. Such multi-packs can, for example, include a curry in one tray, rice in another tray, vegetables in a further tray and so on. Alternatively, the multi-packs can include trays of the same foodstuff, with most of the trays, following purchase, being placed in a fridge or freezer for storage until consumption at a time in the future. In these multi-pack arrangements, the trays are typically placed in a bag, each tray being surrounded by a sleeve or, alternatively, a common sleeve being provided around all the trays to hold them together.

[0006] In any of the abovementioned embodiments, it

will be appreciated that there is considerable wastage of packaging, particularly since the trays are normally discarded following the cooking of the foodstuff(s). In addition, tray portions which are required to be separated prior to or after cooking by the separation of perforated edges, often result in sharp edges being left on the trays which can cause injury to a user.

[0007] Further forms of engagement means between trays are known which do not require separation along perforated edges, such as, for example, a hook type arrangement disclosed in FR2799435 wherein a single hook provided along a part of one edge of a tray allows the tray to be hooked over an edge of a further tray, and EP0820937 wherein protrusions provided on a lower surface of an edge of a tray can be located with corresponding recesses on a palette. However, a problem with these types of engagement means is that if one of the trays is picked up or handled independently of the other tray to which it is engaged, the engagement means on the trays can become separated. This may result in one or both of the trays being dropped and/or the contents of the trays spilling out.

[0008] The aim of the present invention is to overcome the abovementioned problems and to provide additional utility of the trays for foodstuffs and/or for any type of article or articles to be located therein.

[0009] In a first aspect of the present invention there is provided a tray, said tray capable of engagement with at least a second tray, said trays comprising a cavity for the placement of an article or articles therein, each tray being provided with at least first and second engagement means provided at spaced apart locations along an edge thereof to allow mutual engagement of the trays, and characterised in that an indent portion is provided along the edge of each tray between said at least first and second engagement means, such that when the trays are brought into mutual engagement, the first engagement means of the first tray can be provided over and engaged with the second engagement means of the second tray and the first engagement means of the second tray can be provided over and engaged with the second engagement means of the first tray.

[0010] Thus, in order to allow mutual engagement of the engagement means of the trays of the present invention, the edge on which the engagement means are provided is required to be twisted during engagement to a sufficient degree, such that a part of the edge of the first tray is located above and engaged with engagement means on a part of the edge of the second tray and a further part of the edge of the first tray is located below and engaged with engagement means on a further part of the edge of the second tray. This overlapping type of engagement at two engagement sites provides improved securement of the trays when engaged. In addition, when only one of the first and second trays is picked up or handled by a user, the other tray remains engaged therewith.

[0011] Preferably one of the at least first and second

engagement means on each tray is of smaller dimensions than the other engagement means on the tray. Since both trays have substantially the same dimensioned engagement means, this allows for the overlapping form of engagement of the present invention. Thus, the smaller engagement means on the first tray engages with the larger engagement means on the second tray and the larger engagement means on the first tray engages with the smaller engagement means on the second tray. The engagement is typically via friction fit.

[0012] Preferably the edge of each tray on which the engagement means are provided is in the form of a lip, the lip defining at least part of the opening of the cavity of each tray.

[0013] Preferably the lip is provided along at least one side of each tray.

[0014] Preferably the engagement means are formed as an integral part of the lip of each tray.

[0015] The engagement means on both trays are typically provided in a common shape and in substantially the same position, thereby allowing trays to be manufactured to a common design and be engaged. This prevents the need for trays to be manufactured in pairs of differing designs.

[0016] In one embodiment, the engagement means are any or any combination of elongate, round, oval, square or any shaped protrusions on a first surface with matching shaped indents on a second surface. However, the size of respective engagement protrusions change so that the indents match one another.

[0017] Preferably each engagement means is provided as a raised protrusion on a first surface of the lip of each tray and a recess on the opposing surface of the lip of each tray. The recess, in one example, is a cavity provided in the base of the protrusion on the opposing surface.

[0018] Further preferably the raised protrusion is on an upper surface of the lip and the recess is on the opposing lower surface. In this manner, dust, dirt or food is prevented from accumulating in the recess portion when the trays are being processed, filled with items and/or stacked on top of each other. This is particularly important when foodstuffs are to be placed in the cavities of the trays and there are food hygiene requirements to be met.

[0019] Typically the indented portion is indented inwardly and provided on the lip intermediate the engagement means, thereby allowing the cross-over of the overlapping portions of the first and second trays respectively and allowing the manipulation of the respective tray lip portions to provide the engagement and disengagement of the respective engagement means.

[0020] In a further aspect of the invention there is provided a tray system, said tray system comprising at least first and second trays, said at least first and second trays comprising a cavity for the placement of an article or articles therein, each tray being provided with at least first and second engagement means provided at spaced

apart locations along an edge of said trays to allow mutual engagement of the trays, and characterised in that an indent portion is provided along the edge of each tray between said at least first and second engagement means, such that when said at least first and second trays are brought into mutual engagement, the first engagement means of the first tray can be provided over and engaged with the second engagement means of the second tray and the first engagement means of the second tray can be provided over and engaged with the second engagement means of the first tray.

[0021] According to a yet further aspect of the present invention there is provided a food packaging system comprising at least first and second trays according to the present invention and each tray having at least one cavity for the reception of a foodstuff therein.

[0022] In one embodiment, the system is used to provide the trays in engagement to form a retail pack. In this embodiment, the retail pack typically also includes at least one sleeve, sealing material and or other packaging on which printed material identifying the foodstuffs and/or providing information relating thereto is provided.

[0023] In addition, the system can be used to allow the trays to be engaged during the cooking of the foodstuff therein. Alternatively, once purchased, the user can separate the trays to cook foodstuffs for different time periods and/or at different times.

[0024] A specific embodiment of the invention is now described with reference to the accompanying drawings, wherein:-

Figure 1 illustrates a plan view of a tray in accordance with the invention;

Figure 2 illustrates a sectional and elevation view along line A-A of Figure 1;

Figure 3 illustrates a sectional view along line C-C.

Figure 4 illustrates two of the trays of the invention in mutual engagement;

Figure 5 illustrates the trays of Figure 2 used to form part of a retail pack; and

Figures 6 and 7 illustrate in detail the overlapping arrangement of the lips of two of said trays with Figure 7 being a cross sectional view along line D-D.

[0025] Referring firstly to Figures 1 and 2, there is illustrated a tray in accordance with the invention. The tray 2 includes a cavity 4, but may also include a plurality of cavities in other formats, with the cavity being defined by a lip portion 6 which defines the opening 8 into the cavity. The lip portion 6 includes, along one side 12 thereof, an engagement means set, said engagement means set including first and second engagement means 16, 18. Each of the engagement means 16, 18

is formed so that on a first upper surface there is an elongate raised portion 20 and on the opposing underside surface there is a recess 22. A portion of the lip 13 intermediate the first and second engagement means 16, 18 is indented inwardly of the lip. Each of the engagement means 16, 18 is formed of substantially the same shape but of slightly different dimensions, with the first engagement means 16 being of smaller dimensions than second engagement means 18, thereby allowing a friction fit between first and second engagement means of different trays. There is sufficient flexibility in the material used to form the tray such that the raised protrusion 20 of a first engagement means 16 can be located and engaged with a recess 22 of a second engagement means 18 on a further tray, thereby providing retention between the engagement means of the two adjacent trays, as will now be described.

[0026] Figure 4 illustrates two trays 24, 26 of the type shown in Figures 1-3 and it should be noted that the trays are both of the same design. Both of the trays 24, 26 are provided with cavities in which a foodstuff 28, 30 is located. In the embodiment shown, the trays are to be used to allow the foodstuff to be cooked therein and, if required, the trays can be separated to allow the different foodstuffs 28, 30 to be cooked separately. The trays 24, 26 are held in mutual location by the engagement of the engagement means 16, 18 on the respective trays along the common edge 29 of the trays.

[0027] The engagement between the engagement means on respective trays is shown in detail in Figures 6 and 7, whereby the common edges 29 of the trays are brought together so that the engagement means 16 of tray 24 receives in the recess thereof the protrusion of the smaller engagement means 18' of tray 26. The engagement means 16' of tray 26 receives in the recess thereof the protrusion of the smaller engagement means 18 of tray 24. The overlapping arrangement of the respective lip portions of the trays 24, 26 allows the mutual engagement of the smaller engagement means 18; 18' in the respective larger engagement means 16'; 16 thereby providing the engagement between the trays. The indent portion 13 of the lip 6 allows the overlapping arrangement between the engagement means on the two trays. In addition, the flexibility of the material forming the lip 6 along side 12 allows the lip to be flexed and twisted to a sufficient degree to provide the overlapping arrangement of the engagement means.

[0028] In a further embodiment, as shown in Figure 5, the use of the engagement means can be provided to form a retail pack wherein the trays are held in engagement prior to purchase. The trays are also typically enclosed by a sleeve 30 to improve the visibility of the retail pack and also to allow identification of the contents contained in the retail pack.

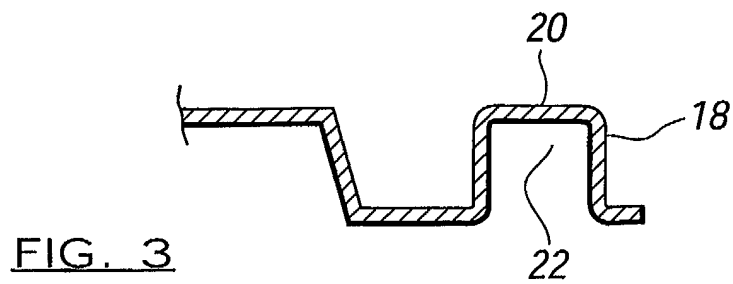
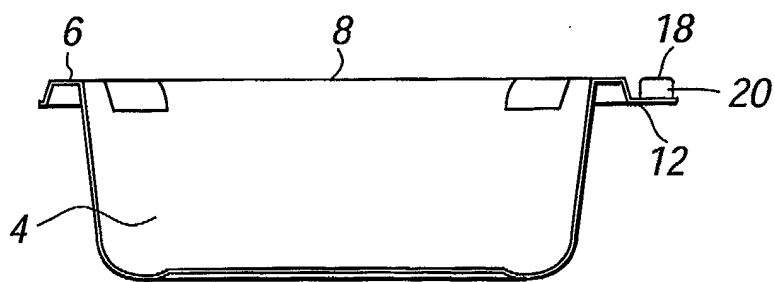
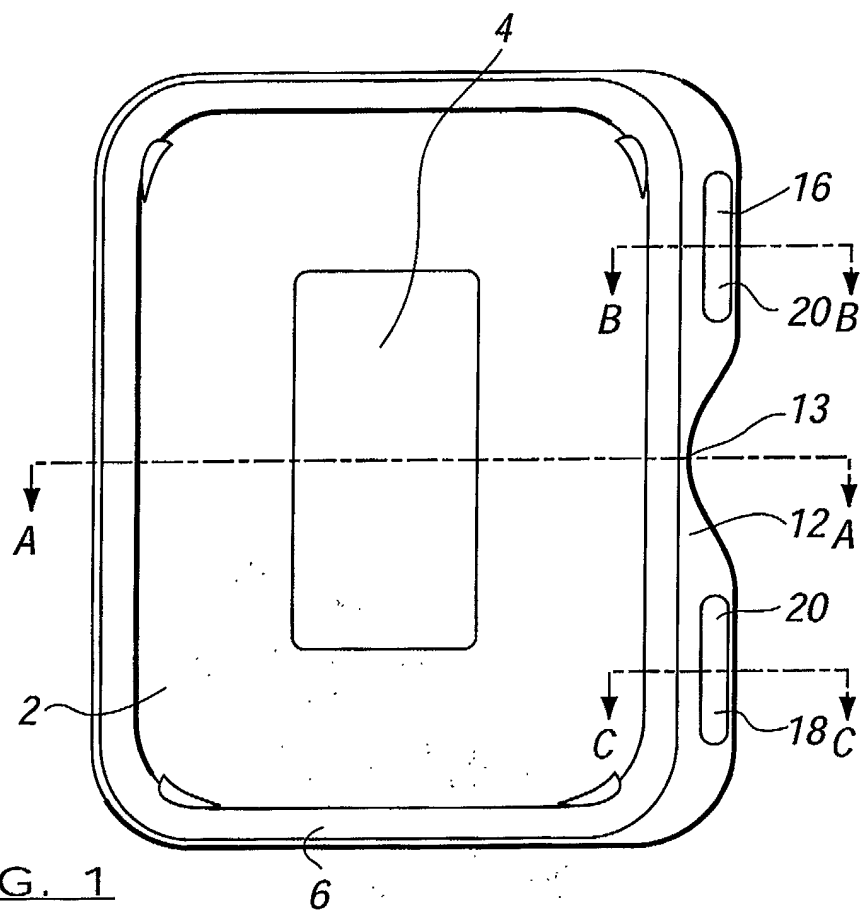
[0029] The engagement means of the trays are typically integrally formed during moulding of the trays. The tray and engagement means can be made from a plastics or foamed plastics material.

[0030] The present invention therefore provides a tray and tray system which allows a common tray design to be provided and utilised which achieves the ability to engage trays together using commonly shaped engagement means.

Claims

1. A tray, said tray (2; 24) capable of engagement with at least a second tray (26), said trays comprising a cavity (4) for the placement of an article or articles therein, each tray being provided with at least first and second engagement means (16, 18; 16', 18') provided at spaced apart locations along an edge thereof to allow mutual engagement of the trays (2; 24, 26) and **characterised in that** an indent portion (13) is provided along the edge of each tray between said at least first and second engagement means (16, 18; 16', 18'), such that when the trays are brought into mutual engagement, the first engagement means (16) of the first tray (2; 24) can be provided over and engaged with the second engagement means (18') of the second tray (26) and the first engagement means (16') of the second tray (26) can be provided over and engaged with the second engagement means (18) of the first tray (2; 24).
2. A tray according to claim 1 **characterised in that** one of the at least first and second engagement means (16, 18; 16' 18') on each tray is of smaller dimensions than the other of said at least first and second engagement means (16, 18; 16' 18').
3. A tray according to claim 2 **characterised in that** the first or second engagement means of smaller dimensions on the first tray (2; 24) engages with the first or second larger dimensioned engagement means on the second tray (26) and vice versa.
4. A tray according to claim 1 **characterised in that** the edge on which the first and second engagement means (16, 18; 16' 18') are provided is in the form of a lip (6), the lip (6) defining at least part of the opening of said cavity (4).
5. A tray according to claim 4 **characterised in that** the lip (6) on which the engagement means (16, 18, 16', 18') are located is provided along one side (12) of each tray (2; 24, 26).
6. A tray according to claim 4 **characterised in that** the lip (6) of the tray (2; 24) overlaps with the lip (6) of the second tray (26) to provide mutual engagement of the engagement means provided on the respective lips.

7. A tray according to claim 4 **characterised in that** the engagement means are an integral part of the lip (6).
8. A tray according to claim 1 **characterised in that** the engagement means (16, 18; 16', 18') are provided as a protrusion (20) on a first surface with a recess (22) on the opposite surface.
9. A tray according to claim 8 **characterised in that** the protrusion (20) is provided on an upper surface of the edge and the recess is provided on an opposing lower surface of the edge.
10. A tray according to claim 8 **characterised in that** the recess (22) is a cavity provided in the base of the protrusion (20) on the opposing surface of the edge.
11. A tray according to claim 8 **characterised in that** the protrusion (20) is any or any combination of an elongate, round, oval or square shaped protrusion and the recess (22) is shaped accordingly on the opposite side.
12. A tray according to claim 1 **characterised in that** the engagement means (16, 18;) on tray (2; 24) are provided in a corresponding location to the engagement means (16' 18') on the second tray (26).
13. A tray system, said tray system comprising at least first and second trays, said at least first and second trays comprising a cavity (4) for the placement of an article or articles therein, each tray being provided with at least first and second engagement means (16, 18; 16', 18') provided at spaced apart locations along an edge thereof to allow mutual engagement of the trays (2; 24, 26), and **characterised in that** an indent portion (13) is provided along the edge of each tray between said at least first and second engagement means (16, 18; 16', 18'), such that when said at least first and second trays are brought into mutual engagement, the first engagement means (16) of the first tray (2; 24) can be provided over and engaged with the second engagement means (18') of the second tray (26), and the first engagement means (16') of the second tray (26) can be provided over and engaged with the second engagement means (18) of the first tray (2; 24).
14. A foodstuff packaging system, said system comprising at least first and second trays (24, 26) in accordance with claim 1 or claim 13, each tray having at least one cavity for the reception of a foodstuff (28, 30) therein.
15. A foodstuff packaging system according to claim 14 **characterised in that** the trays (24, 26) are engaged together to form a retail pack.
16. A system according to claim 15 **characterised in that** the retail pack includes at least one sleeve (30) on which printed material identifying the foodstuffs (28, 30) contained in the trays (24, 26) is provided.



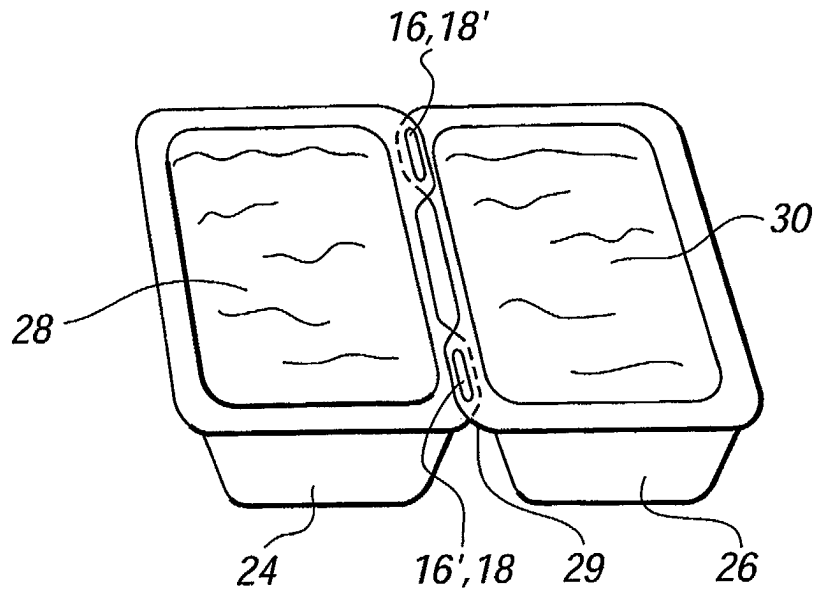


FIG. 4

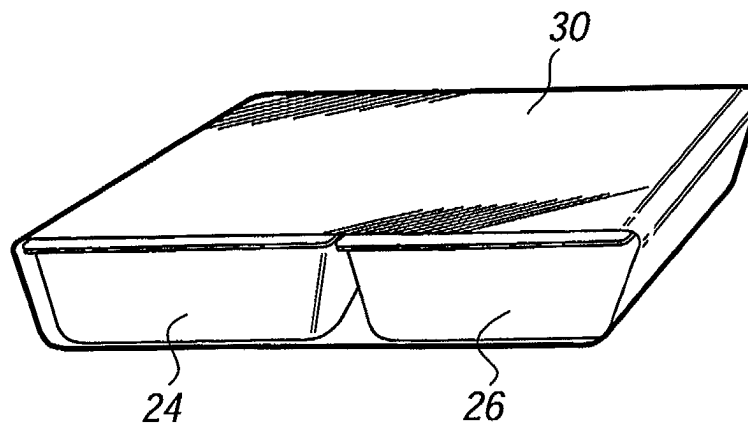


FIG. 5

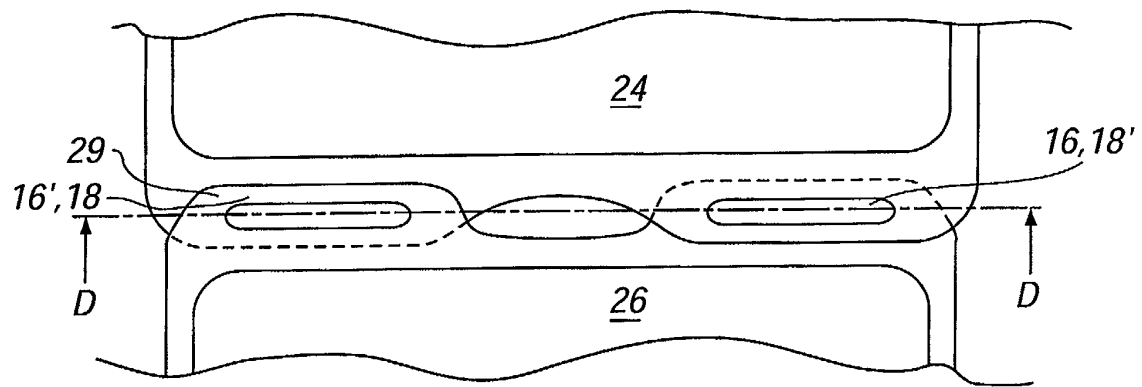


FIG. 6

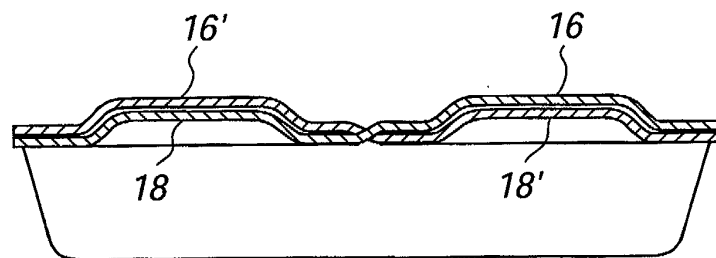


FIG. 7