

(19) **DANMARK**

(10) **DK/EP 3607823 T3**



(12)

Oversættelse af europæisk patentskrift

Patent- og
Varemærkestyrelsen

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- (51) Int.Cl.: **A 21 D 13/14 (2017.01)** **A 21 C 15/02 (2006.01)** **A 21 D 13/32 (2017.01)**
A 21 D 13/36 (2017.01) **A 23 G 1/54 (2006.01)** **A 23 G 3/54 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2025-02-24**
- (80) Dato for Den Europæiske Patentmyndigheds
bekendtgørelse om meddelelse af patentet: **2024-12-04**
- (86) Europæisk ansøgning nr.: **18188472.7**
- (86) Europæisk indleveringsdag: **2018-08-10**
- (87) Den europæiske ansøgnings publiceringsdag: **2020-02-12**
- (84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV
MC MK MT NL NO PL PT RO RS SE SI SK SM TR**
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- (54) Benævnelse: **FREMGANGSMÅDE OG ANORDNING TIL FREMSTILLING AF LAGDELTE FØDEVARER**
- (56) Fremdragne publikationer:
EP-A1- 0 561 513
EP-A2- 0 909 535
WO-A1-2016/016834
AT-B- 304 245
DE-A1- 102013 114 753
DE-B3- 102013 226 779
DE-C1- 19 741 717

METHOD AND DEVICE FOR MANUFACTURING A LAYERED FOODSTUFF

Description

The invention relates to a method for producing a layered food product, to a device for connecting a first substantially plate-shaped food product part to a plate-shaped filling, and to the use of an apparatus for heating.

From DE 197 41 717 C1, DE 10 2013 226779 B3 and EP 3 199 030 A1, devices and methods for producing long-life baked goods having an upper pastry part, a lower pastry part and an intermediate layer are known.

For example, a liquid, creamy or pasty mass can be applied between two pastry parts, which binds the pastry parts together and then hardens more or less.

The disadvantage of sandwich-type food products, such as a combination of pastry parts and a chocolate layer, is often that the intermediate layer, for example the chocolate layer, is not well placed, is unevenly distributed on the pastry part and/or may even bulge out of the pastry parts.

In order to make sandwich-like food products more visually appealing, it is known to provide the intermediate layer as a plate-shaped, dimensionally stable layer. Said layer has to be connected to the lower and upper pastry part.

It is known to establish this connection using a joining process. Possible joining processes include adhesive bonding, piecing together, filling, pressing on and pressing in. In particular, a joining compound, which has to be applied to the filling layer, can act as an adhesive layer between the filling layer and the pastry part.

The joining compound can be provided on the surface of the intermediate layer in the form of ribbed edges, knobs or similar structures.

If an adhesive material is used, its taste and consistency must match the other layers and must not increase the cost of the product. In a joining process without an additional adhesive layer, a sufficiently large force must usually be exerted on

the joining partners. This can lead to a deterioration in the layer quality or to a deterioration in the visual appearance that is to be optimized. There is also a risk of breakage when joining partners are made of brittle material, such as in the case of pastry parts.

- 5 The object is therefore to provide a method and a device which overcome the disadvantages of those known and which, in particular, provide a precisely placeable and durable connection between two layers in a simple manner.

The object is achieved by a method for producing a layered food product which comprises at least one first substantially plate-shaped food product part and a
10 plate-shaped filling arranged on this plate-shaped food product part. A plate-shaped object is understood here to be an object which has two opposing surfaces whose extent is greater than the space between them. Each of the surfaces defines one side of the object.

The corresponding food product part and/or the filling thus have two opposing
15 surfaces which substantially determine the overall shape. The food product part is a dimensionally stable part, namely a pastry part. The filling can consist of a filling mass which is a fat-based mass, a chocolate-based mass, a compound-based mass, a sugar-based mass, a fondant-based mass, a jelly, a jam, a fruit-based mass and/or a water- and sugar-based mass that hardens in a different way.

- 20 The method comprises the following work steps.

First, a plate-shaped filling is produced or provided. The filling is preferably dimensionally stable at room temperature, which means that it retains its shape under its own weight.

The filling has on at least one side an area projecting from a plane. The surface of
25 the plate-shaped filling is therefore not flat, at least on one side. The filling consists of a plate-shaped base layer having two opposite, preferably parallel, surfaces, which are flat, and at least one projecting area located thereon.

Preferably, a plurality of projecting areas are provided on one side. Preferably, the edge surface of the plate-shaped filling is designed such that it has a visually appealing shape since it is visible in the finished food product. For example, it is smooth. However, grooves or projecting areas can also be provided.

- 5 In a further work step, the at least one projecting area of the plate-shaped filling is heated. Preferably, all projecting areas on one side are heated, preferably simultaneously, if there is a plurality of projecting areas. As a result, the filling material can be deformed more easily under pressure. The material can melt during the heating process.
- 10 In a further work step, at least one plate-shaped food product part is produced or provided. This part is positioned on the side of the filling with the heated projecting area.

- The connection between the food product part and the filling is then established, in particular by exerting a force which acts in the direction of the food product and/or
- 15 in the direction of the side of the filling with the heated projecting area. The heated projecting area acts similarly to an adhesive. If the food product part is positioned on the heated projecting area, it deforms and forms a connecting layer between the filling and the food product part.

- Thus no special material for adhering is necessary. The layered food product
- 20 produced can consist only of the food product part and the filling mass. No undesirable joining layer can be seen at the edge of the layered food product.

- Since the heated projecting area can be deformed more easily than the unheated filling mass, only a small force needs to be applied to connect it. The weight of the filling or food product part may be sufficient. The connection is therefore
- 25 established without impairing the filling or the food product part.

The plate-shaped filling provided can have a projecting area or projecting areas on one side only. On the other side, a second plate-shaped food product part can be

arranged which is already connected to the plate-shaped filling. On the other side, a decoration may already be attached.

The projecting area can consist of the same filling mass as the plate-shaped base layer. However, the projecting area can also comprise a different or modified mass
5 that is particularly suitable for bonding. For example, the projecting area can have a higher fat content than the plate-shaped base layer. A mass with an increased fat content crystallizes more stiffly and therefore has better adhesive properties.

The filling can, for example, be produced in a mold which in particular predetermines the profile of the at least one projecting area on one side of the
10 filling. For this purpose, the filling mass is poured into a mold and solidified in the mold. The filling can then be removed from the mold. The mold has, in particular at the bottom, at least one corresponding recess in which the at least one projecting area is formed. The mold also determines the surface finish of the edge surface of the filling. Said finish is preferably smooth.

15 In an advantageous development of the invention, a second food product is produced or provided, which is placed on a not yet solidified filling mass that is still in the mold. In particular, the second food product part is pressed on. Since the filling has not yet solidified, a connection is established between the filling and the second food product part. The filling is solidified, for example by cooling, only
20 when the second food product part is connected to the filling.

Preferably, the dimensions of the first and second food product part, as well as of the filling, correspond to one another, so that the first and second food product part, as well as the filling, can lie on top of one another in a sandwich-like manner without one layer protruding laterally over another.

25 In a further method step, the second food product part can be transferred together with the filling, the filling being removed from the mold. Preferably, the second food product and the filling are moved away from the mold, in particular also rotated so that the projecting area points upward. The projecting areas formed by the mold can then be accessed for heating.

Preferably, the second food product part together with the filling connected thereto is placed in a counter mold so that the at least one projecting area faces away from the counter mold. The at least one projecting area can then, for example, point upward so that, for example, a tool can be brought to the filling from above
5 and the projecting area can be heated.

The projecting area can be heated after removal from the mold, the first food product part can be brought close to the filling and then a connection can be established between the filling and the first food product part. In this way, a sandwich-like food product is obtained.

10 Since the filling is produced in a mold and is not impaired by subsequent method steps, the edge surface of the plate-shaped filling meets all visual requirements.

If the mold size is selected according to the size of the food product parts and the food product parts are placed precisely, the filling can reach very precisely to the edge of the food product part. The finished food product can then have a smooth
15 edge surface.

Preferably, the projecting area has a shape tapering with the distance from the plane before heating. For example, the projecting area is conical in shape.

The projecting area can have a circular or oval base, or it may be rib-shaped or ring-shaped.

20 The area of the projecting area furthest from the plane, in particular a tip, is preferably more than 1 mm from the plane.

The length of the maximum diameter of the base of the projecting area is preferably at least 3 mm.

The minimum dimensions guarantee that the projecting area comprises enough
25 filling mass to achieve an adhesive effect.

In particular, along all diameters of the plane, the sum of all projecting areas does not cover more than $8/10$, preferably not more than $3/4$, of the length of the diameter.

Preferably, the distance between the base of the at least one projecting area and the edge of the plane corresponds to at least $1/20$ of the smallest diameter of the plane.

The heated material cannot penetrate beyond the edge of the plane.

In an advantageous embodiment, the at least one projecting area is selectively heated by a heating device. In particular and substantially only the at least one projecting area of the filling is heated and in the process in particular softened. This guarantees that the plate-shaped base layer of the plate-shaped filling is neither softened nor deformed.

In a further method step, the food product part connected to the filling can be cooled. The food product part and the filling connected thereto form a layered food product or a layered food part product. The food product or food part product can, for example, be passed through a cooling tunnel.

The food product or food part product can then be further processed, for example decorated and/or packaged.

The object is also achieved by a device for connecting a first substantially plate-shaped food product part to a plate-shaped filling. The plate-shaped filling has at least one area projecting from the plane on at least one side. The device is used to produce a layered food product or a layered food part product and in particular for carrying out a method as described above.

According to the invention, the device has a device for heating the at least one area projecting from the plane and has an apparatus for receiving, positioning and in particular for pressing on the first food product part.

Preferably, the device comprises an apparatus for pouring filling mass, which comprises a mold for molding the filling with at least one projecting area and a metering device for the filling mass.

5 The apparatus for pouring is preferably arranged upstream of the device for heating. Between the apparatus for pouring and the device for heating there can be a transfer device by means of which the filling is removed from the mold and preferably rotated so that the at least one projecting area can be accessed by the device for heating. The transfer device can be, for example, a belt, a robot arm or a mold turner.

10 Preferably, the bottom area of the mold has a profile which defines the at least one projecting area. For example, the profile is designed in such a way that the at least one projecting area tapers with increasing distance from the plane.

In an advantageous embodiment of the invention, the device has an apparatus for receiving, positioning and in particular pressing on a second food product part.

15 This could, for example, be a pick-and-place unit that brings and places the second food product parts.

This apparatus is preferably arranged directly downstream of the device for pouring the filling mass or is designed together with the apparatus for pouring, so that the second food product part can be applied to the not yet solidified filling
20 mass located in the mold.

In a further advantageous embodiment, the device comprises a transfer device for transferring the second food product part connected to the filling. The transfer device can be, for example, a pick-and-place unit, a belt, a robot arm and/or a mold turner.

25 In this case, the second food product part connected to the filling is removed from the mold so that the at least one projecting area of the device can be accessed for heating. Preferably, the second food product part is moved translationally and/or rotated together with the filling.

The device for heating the at least one projecting area is a device which enables targeted heating of at least one limited area, which is preferably smaller than the planar surface of the filling. In particular, the device for heating comprises a shielding template.

- 5 Advantageously, the device for heating is a device which enables the targeted heating of at least one projecting area with a circular or oval base. The length of the maximum diameter of the base is preferably at least 3 mm.

Alternatively or additionally, the device can enable the heating of an area with a rectangular base. The device is preferably designed to heat areas with a maximum
10 diameter of up to 3 mm. The device is further preferably designed such that the regions adjacent to the projecting areas do not receive any direct heat supply.

According to the invention, the device for heating the at least one projecting area comprises an infrared heating field.

Advantageously, the device comprises a cooling device for cooling a food product
15 part connected to the filling.

The object is further achieved by a use of a device for heating at least one projecting area on one side of a plate-shaped filling and subsequently connecting the filling to a plate-shaped food product part.

The invention is explained below in exemplary embodiment based on drawings.

20 In the figures:

Fig. 1 is a schematic representation of a first method step;

Fig. 2 is a schematic representation of a second method step;

Fig. 3 is a schematic representation of a third method step;

Fig. 4 is a schematic representation of a fourth method step;

25 Fig. 5 is a schematic representation of a fifth method step;

Fig. 6 is a schematic representation of a sixth method step;

Fig. 7a-d are schematic representations of examples of different molds;

Fig. 8 is a first example of a filling in plan view;

Fig. 9a is a further example of a filling in plan view;

5 Fig. 9b is a further example of a filling in plan view;

Fig. 9c is a further example of a filling in plan view.

Fig. 1-6 are, in a schematic representation, steps of an exemplary method.

In the method according to the invention, a plate-shaped filling 3 can first be produced which has on at least one side 5 at least one area 4 projecting from a
10 plane 6. The filling can, for example, have two projecting areas 4.

The filling 3 is produced, for example, in a mold 7 which determines the profile of the projecting areas 4.

The production takes place in an apparatus 20 for pouring. In said apparatus, filling material is metered from a metering device 21, here a nozzle, into the mold
15 7. Of course, many molds can be filled by a plurality of nozzles at the same time.

For example, chocolate-based mass warmed to room temperature can be poured into the mold 7, where it solidifies.

For example, as shown in Fig. 2, a second food product part 2 is provided. The second food product can be a pastry part.

20 As shown in Fig. 3, the second food product part 2 can be placed on the filling 3, which is still in the mold 7, preferably before the filling 3 has solidified.

The filling 3 adheres to the second food product part 2 and thus, after the filling mass has solidified, a permanent connection is created between the filling 3 and the second food product part 2.

If necessary, a force can additionally be applied, for example the second food product part 2 can be pressed against the filling 3.

Preferably, the outer contours of the second food product part 2 and the filling 3 correspond. The food product part 2 connected to the filling 3 can then be cooled, for example in a cooling tunnel. For this purpose, the filling 3 can remain in the mold 7 or be removed therefrom.

As shown in Fig. 4, the second food product part 2 can be transferred together with the filling 3, the filling 3 being removed from the mold 7. The second food product part 2 can be rotated together with the filling 3 and placed in a counter mold 8 so that the at least one projecting area 4 points away from the counter mold 8.

The counter mold 8 has a receptacle 9 for the second food product part 2.

As shown in Fig. 5, the projecting area 4 is heated. This is preferably done by means of a device 10 for heating, comprising an infrared heating field 11 and a shielding template 12. The shielding template 12 ensures targeted heating of a limited area which is smaller than the surface of the filling 3. In particular, the edge area 13 of the filling 3 is not heated, so that the edge surface 14 retains the shape and surface texture predetermined by the mold 7.

More or less heat is introduced, depending on the filling material. It is sufficient if the filling material of the projecting areas deforms under the weight of the food product part 1 (see Fig. 6).

As shown in Fig. 6, a first food product part 1 can be provided which is positioned on the side 5 of the filling 3 with the heated projecting areas 4; see Fig. 4.

The connection is then established between the food product part 1 and the filling 3. The heated filling material adheres to the first food product part 1 and thus, after the filling mass has solidified, a permanent connection is created between the filling 3 and the first food product part 1. The filling 3 then has a flat shape and forms a layer extending parallel to the food products 1 and 2.

If necessary, a force can additionally be applied, for example the first food product part 1 can be pressed against the filling 3. The layered food product 30 can then be cooled.

Fig. 7a-d are schematic representations of examples of different molds 7a, 7b, 7c,
5 7d.

With each of the molds 7a, 7b and 7c, a plurality of projecting areas 4 is achieved, while in the mold 7d only one projecting area 4 can be produced.

What all molds 7a, 7b, 7c, 7d have in common is that the projecting areas have a minimum distance 15 from the edge surface 14. This distance is preferably at least
10 1 mm.

The tip 17 of the at least one projecting area 4 has a distance 16 from the plane, which is preferably greater than 1 mm.

Figure 8 is a plan view of a first example of a filling 3 having a projecting area 4. The filling has an oval base. The maximum diameter 18 of the base of the
15 projecting area 4 is at least 3 mm.

The length of the maximum diameter 18 of the base of the projecting area preferably corresponds to a maximum of 9/10 of the maximum length 19 of the plane 6.

Fig. 9a-9c are plan views of further examples of a filling 3 having projecting areas
20 4.

The projecting fillings 3 can be arranged in strips as shown in Fig. 9a, in staggered rows as shown in Fig. 9b or in parallel rows as shown in Fig. 9c.

PATENTKRAV

1. Fremgangsmåde til fremstilling af et lagdelt fødevareprodukt (30), der omfatter mindst en første, i det væsentlige pladeformet fødevareprodukt del (1, 2), nemlig en første kagedel, og et pladeformet pålægningslag (3), som er anbragt derpå
- 5 og består af en pålægningsmasse, hvor der er tale om en fedtmasse, en chokolademasse, en compound-masse, en sukkermasse, en fondantmasse, en gelé, en marmelade, en frugtmasse og/eller en vand- og sukkerbaseret masse, som hærder på en anderledes måde, **kendetegnet ved** følgende trin:
- fremstilling eller tilvejebringelse af det pladeformede pålægningslag (3) i en
 - 10 form (7), hvor pålægningslaget (3) på mindst én side (5) har mindst ét område (4), der rager ud fra et plan (6), hvor formen bestemmer profilen af det mindst ene udragende område (4) på den ene side af pålægningslaget (3);
 - opvarmning af det udragende område (4);
 - fremstilling eller tilvejebringelse af mindst én fødevareprodukt del (1, 2);
 - 15 - positionering af fødevareprodukt delen (1) på den side af pålægningslaget (3), der har det opvarmede udragende område (4);
 - frembringelse af forbindelsen mellem fødevareprodukt delen (2) og pålægningslaget (3), især nedtrykning af fødevareprodukt delen (1) på det opvarmede udragende område (4),
 - 20 hvor det mindst ene udragende område opvarmes selektivt ved hjælp af en opvarmningsanordning (10), således at det pladeformede basislag af det pladeformede pålægningslag ikke bliver blødt og ikke deformeres.
2. Fremgangsmåde ifølge krav 1, hvor der fremstilles eller tilvejebringes en anden fødevareprodukt del (2), nemlig en anden kagedel, som placeres på den endnu
- 25 ikke størknede pålægningsmasse i formen (7) og især påtrykkes.
3. Fremgangsmåde ifølge krav 2, hvor den anden fødevareprodukt del (2) omplaceres sammen med pålægningslaget (3), hvor pålægningslaget (3) fjernes fra formen (7).

4. Fremgangsmåde ifølge krav 3, hvor den anden fødevareprodukt del (2) sammen med pålægningslaget (3) placeres i en kontraform (8), således at det mindst ene udragende område (4) vender væk fra kontraformen (8).

5. Fremgangsmåde ifølge et af kravene 1-4, hvor området af det udragende område længst væk fra planet, især spidsen (17) af det mindst ene udragende område (4), befinder sig i en afstand (16) fra planet (6), der er større end 1 mm, længden af den maksimale diameter (18) af det udragende områdes grundflade udgør mindst 3 mm, og/eller længden af den maksimale diameter (18) af det udragende områdes grundflade udgør højst 9/10 af planets (6) maksimale længde (19) eller bredde.

6. Fremgangsmåde ifølge et hvilket som helst af kravene 1-5, hvor summen af alle udragende områder langs alle diametre af planet ikke dækker mere end 8/10, fortrinsvis ikke mere end 3/4, af længden af diameteren.

7. Fremgangsmåde ifølge et hvilket som helst af kravene 1-6, hvor anordningen til opvarmning (10) af det mindst ene udragende område (4) omfatter et infrarødt opvarmningsfelt (11) og en afskærmningsskabelon (12).

8. Anordning til etablering af forbindelse mellem en første, i det væsentlige pladeformet fødevareprodukt del (1, 2), nemlig en første kagedel, og et pladeformet pålægningslag (3), der har mindst ét udragende område (4) på mindst én side, til fremstilling af et lagdelt fødevareprodukt (30), især til udførelse af fremgangsmåden ifølge et af kravene 1-7, **kendetegnet ved, at** anordningen omfatter en anordning til opvarmning (10) af det område (4), der rager ud fra planet (6),

og en indretning til modtagelse, positionering og fortrinsvis påtrykning af den første fødevareprodukt del (2), hvor anordningen til opvarmning (10) af det mindst ene udragende område (4) muliggør målrettet opvarmning af et begrænset område, fortrinsvis mindre end den plane flade af pålægningslaget (3), hvor anordningen til opvarmning (10) af det mindst ene udragende område (4) omfatter et infrarødt opvarmningsfelt (11) og en afskærmningsskabelon (12).

9. Anordning ifølge krav 8, hvor anordningen omfatter en indretning til støbning (20) af pålægningsmasse (3), hvilken indretning omfatter en form (7) til formning af

pålægningslaget (3) med mindst ét udragende område (4) og en doseringsanordning (21) til pålægningsmassen.

10. Anordning ifølge krav 9, hvor formen (7) definerer en profil af det mindst ene udragende område (4), der indsnævres med stigende afstand fra planet.

5 11. Anordning ifølge et hvilket som helst af kravene 8 til 10, hvor anordningen omfatter en indretning til modtagelse, positionering og fortrinsvis nedtrykning af et andet fødevareprodukt (1).

12. Anordning ifølge krav 11, hvor anordningen omfatter en
omplaceringsanordning til omplacering af den anden fødevareprodukt (2), der er
10 forbundet med pålægningslaget (3).

13. Anordning ifølge krav 12, hvor anordningen omfatter en kontraform (8) til afsætning af en fødevareprodukt (2), der er forbundet med pålægningslaget (3).

14. Anordning ifølge et af kravene 8-13, hvor opvarmningsanordningen (10)
muliggør målrettet opvarmning af mindst ét udragende område (4) med en cirkulær
15 eller oval grundflade, hvis maksimale diameter fortrinsvis udgør mindst 3 mm, og/eller
hvor opvarmningsanordningen (10) muliggør målrettet opvarmning af mindst ét
udragende område (4) med en i det væsentlige rektangulær grundflade.

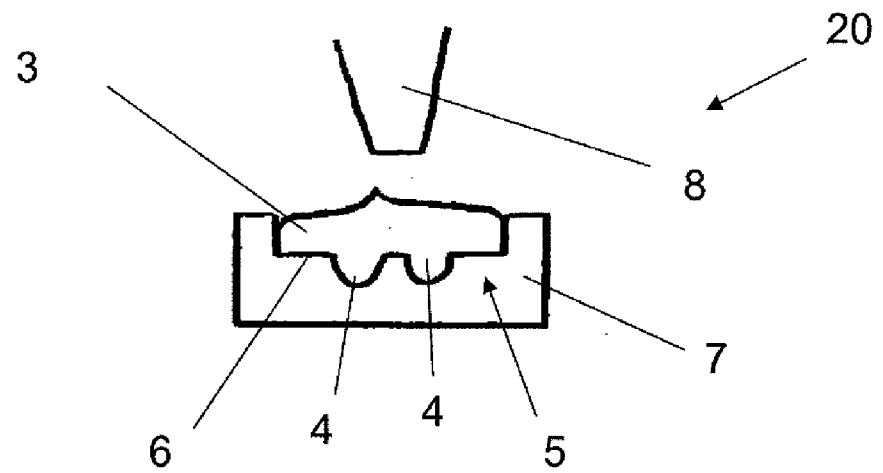


Fig. 1

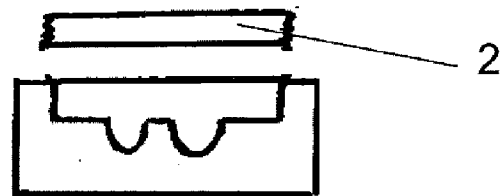


Fig. 2

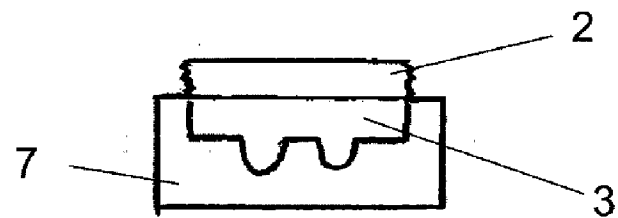


Fig. 3

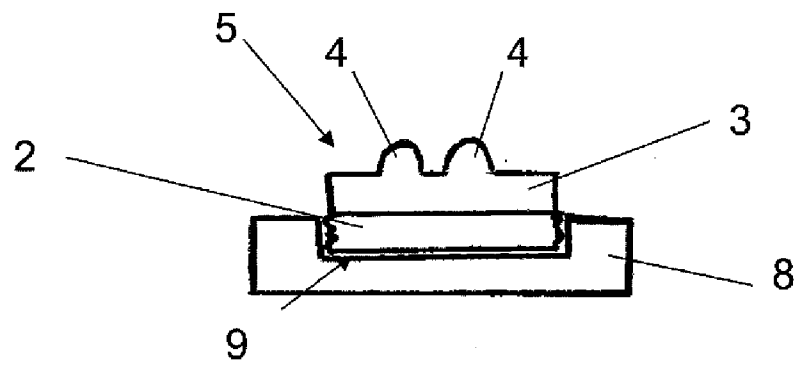


Fig. 4

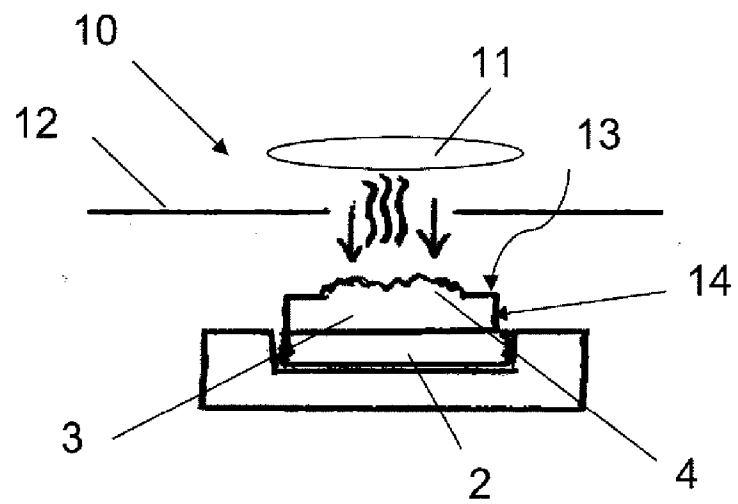
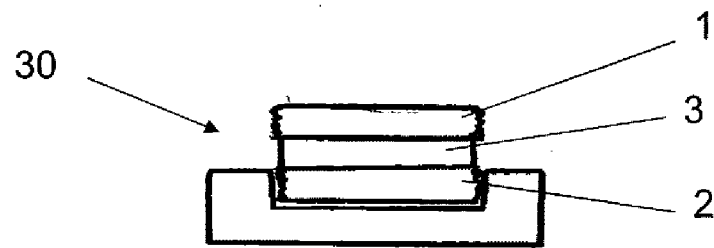
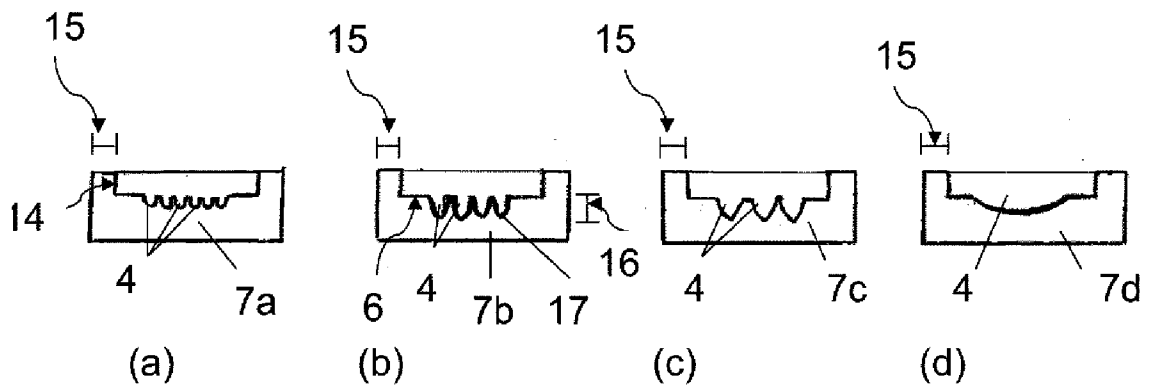
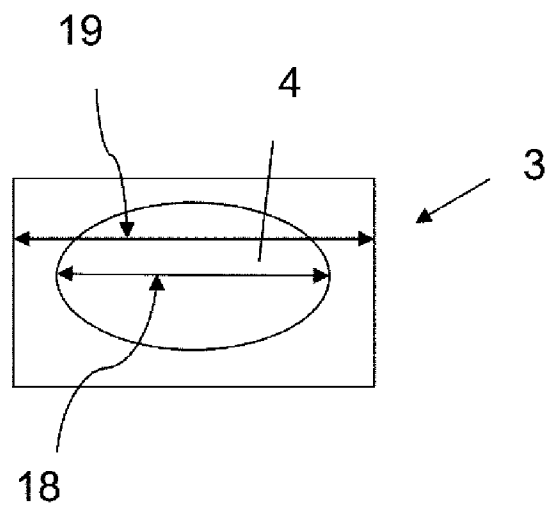
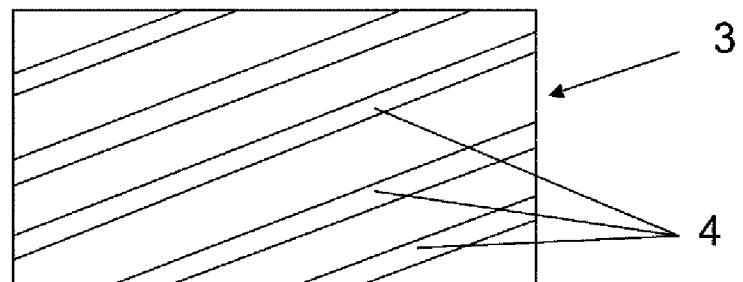
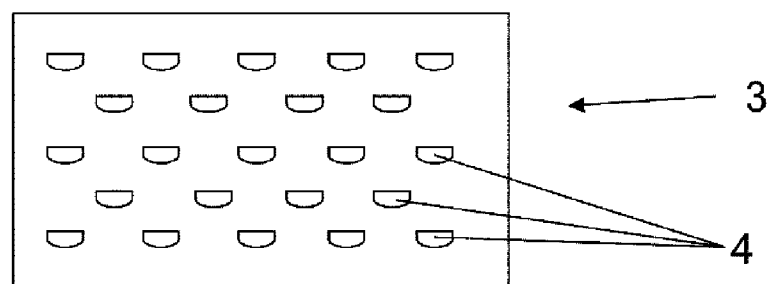
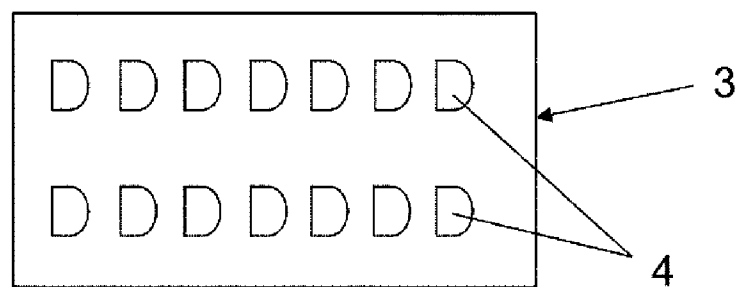


Fig. 5

**Fig. 6****Fig. 7****Fig. 8**

**Fig. 9a****Fig. 9b****Fig. 9c**