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(54) **Title**: DEVICE FOR SUPPORTING DOUGH PORTIONS AND AN ASSEMBLY FOR DOUGH TREATMENT COMPRISING SUCH A DEVICE

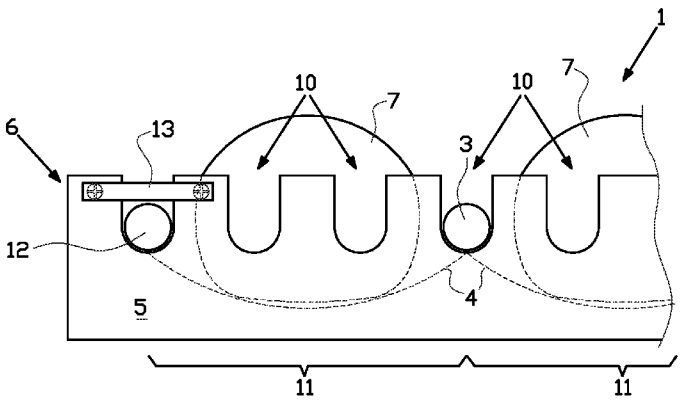

FIG. 3A

(57) **Abstract**: Product carrier (1) for dough portions (7) comprising: a frame (2), a cloth (4), and a number of bars (3) that are attached to the cloth substantially parallel to each other and spaced apart from each other. The bars extend over the full distance between two opposing sides of the frame. In a first condition two consecutive bars are coupled to the frame at a mutual first distance that is smaller than the length of the cloth between said bars, and in a second condition are coupled to the frame at a mutual second distance that substantially equals the length of the cloth between said bars. On the two opposing sides (5) the frame is provided with a series of recesses (10) that are open at the top for placing the outer ends of the two consecutive bars therein, wherein at least one of the bars is detachably coupled to the frame.

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Device for supporting dough portions and an assembly for dough treatment comprising such a device

BACKGROUND OF THE INVENTION

The invention relates to a device for supporting dough portions, also called product carriers, particularly during proofing of the dough.

The invention further relates to an assembly for dough treatment, particularly for proofing of dough.

European patent application 0 595 432 describes a product carrier comprising a frame having a cloth attached to various bars therein, wherein the bars extend within the frame between two opposing first sides. The cloth is furthermore permanently connected to two opposing second sides that are situated substantially transverse to the first sides. The frame is extendable from a first position, wherein the cloth sags between two bars and forms a trough, into a second extended position, wherein the cloth is stretched taut over the entire surface.

French patent 1.492.884 describes a frame, wherein the cloth is only attached to the bars, as a result of which the cloth can be stretched taut within a permanent frame. In this frame the bars are provided with round apertures at their outer ends, through which apertures a rod-shaped side section of the frame extends, as a result of which the bars are slidably attached to two opposing rod-shaped side sections of

the frame. Between the bars also a spacer is placed on the rod-shaped side sections in order to limit bending in the first position, in which the cloth sags and forms a trough.

SUMMARY OF THE INVENTION

It is an object of the invention to provide alternative devices for supporting dough portions, which preferably are easy to adjust for switching from first dough portions to second dough portions of other dimensions than the first dough portions, particularly having a another width substantially transverse to the longitudinal direction of the bars that carry the cloth.

According to a first aspect the invention for that purpose provides a device for supporting dough portions comprising:

a substantially rectangular frame,

a substantially rectangular cloth, and a number of bars that are attached to the cloth substantially parallel to each other and spaced apart from each other, wherein the bars extend substantially over the full distance between two opposing sides of the frame,

wherein the bars with their outer ends are movably coupled to the two opposing sides of the frame,

wherein two consecutive bars in a first condition of the device, in a first position are coupled to the frame at a mutual first distance between the two consecutive bars, wherein the mutual first distance is smaller than the length of the cloth extending between said bars,

wherein the two consecutive bars in a second condition of the device, in a second position are coupled to the frame at a mutual second distance between the two consecutive bars, wherein the mutual

second distance substantially equals the length of the cloth extending between said bars,

wherein the frame on the two opposing sides is provided with a series of recesses that are open at the top for placing the outer ends of the two consecutive bars therein at the mutual first or second distance.

In a first condition of the device the cloth between the two consecutive bars will sag and form a trough for placing dough portions therein. In the second condition of the device the cloth will be stretched substantially taut between the two consecutive bars as a result of which the dough portions lie on top of the stretched cloth and can more easily be taken from the cloth. As the bars, both in the first condition and in the second condition have been placed in recesses, the position of the bars in the frame is thus secured. Particularly in the first condition the width of the trough is defined by the mutual first distance set between the bars. When placing dough portions in the device according to the invention the bars remain at the secured and set mutual first distance and the cloth will not sag further.

As the devices according to the state of the art use sliding bars, when placing dough portions on the cloth between two consecutive bars, said bars will move towards each other and the cloth will sag further. On the one hand this results in the cloth exerting a sideward pressure on the dough portions, which may be detrimental to the structure of the dough. On the other hand the position of the bars will shift because of this and this will have to be taken into account when placing other dough portions in the device, so that said other dough portions are placed correctly on the cloth between two consecutive bars.

According to the invention one or more of the bars are detachably placed in two opposing recesses of the frame. As a result the one or more detachably placed bars can be placed at different positions in the

series of recesses, and the mutual distance between two consecutive bars can be adjusted to the dimensions and/or shape of the dough portions to be supported by the device.

In one embodiment the bars are detachably coupled to the frame. In that way the cloth with the bars can easily be removed from the frame in order to clean and/or replace the cloth and/or the bars.

In one embodiment on a first side of the frame placed transverse to the two opposing sides, the cloth is permanently connected to the frame. In one embodiment on a first side of the frame placed transverse to the two opposing sides, the cloth is permanently connected to an end bar, wherein the end bar is substantially location-fixedly connected to the frame. As the cloth is permanently connected to the first side of the frame, the cloth can be easily stretched into the second condition by engaging the cloth at an outer end facing away from the first side of the frame and subsequently moving said outer end away from the first side. Preferably prior to this action at least the movable bars are moved out of their recesses.

In one embodiment the outer ends of at least the movable bars are adapted for a lifting device engaging thereon for lifting at least the movable bars out of the recesses.

In one embodiment the series of recesses is adapted for placing at least the two consecutive bars in several different mutual first distances, wherein the cloth between the two consecutive bars sags and forms a trough. In one embodiment the series of recesses comprises several recesses within the length of the cloth between the two consecutive bars. In one embodiment the series of recesses comprises several regularly spaced apart recesses. As a result the mutual distance between the two consecutive bars, and thus the width of the trough and the extent of sagging of the

cloth, can be set. In that way the mutual distance between the two consecutive bars can easily be adjusted to the shape of the dough portions. The device according to this embodiment is easy to adapt for switching from first dough portions to second dough portions of different dimensions than the first dough portions, particularly having another width substantially transverse to the longitudinal direction of the bars that carry the cloth.

In one embodiment each of the recesses debouches into an opening in the upper side of the frame, wherein the recesses are widened towards the opening. As at least near the opening in the upper side of the frame the recesses are widened, the rods can be placed more easily in the recesses of choice.

According to a second aspect the invention provides an assembly for dough treatment comprising a device for supporting dough portions as described above. Preferably the assembly comprises a proofing cabinet.

In one embodiment the assembly is furthermore provided with a lifting device for lifting the outer ends of at least the movable bars out of the recesses. In one embodiment the lifting device comprises a substantially straight guide that lifts the outer ends of at least the movable bars out of the recess to above an upper side of the two opposing sides, wherein the guide is adapted for carrying the outer ends of at least the movable bars and for guiding the outer ends of at least the movable bars along the guide at least during moving the bars from the first to the second position, or vice versa.

In one embodiment the assembly is further provided with a displacement device, wherein the displacement device comprises an engagement device for engaging one or more of the movable bars for moving the bars from the first to the second position, or vice versa.

In one embodiment the engagement device is adapted for engaging an outer end of the cloth extending away from the first side of the frame and/or for engaging a bar attached to or near the outer end of the cloth extending away from the first side of the frame.

In one embodiment the assembly is further provided with a removal device for removing the dough portions from the cloth, at least in the second condition of the device for supporting dough portions.

The aspects and measures described in this description and the claims of the application and/or shown in the drawings of this application may where possible also be used individually. Said individual aspects may be the subject of divisional patent applications relating thereto. This particularly applies to the measures and aspects that are described per se in the sub claims.

SHORT DESCRIPTION OF THE DRAWINGS

The invention will be elucidated on the basis of a number of exemplary embodiments shown in the attached drawings, in which:

figures 1A and 1B show a top view and a side view of a product carrier according to the invention in a first condition,

figures 2A and 2B show a top view and a side view of the product carrier of figures 1A and 1B in a second condition,

figure 3A shows a detail view of a side with recesses according to a first exemplary embodiment in the first condition,

figure 3B shows a detail view of the side with recesses of figure 3A in the second condition,

figure 4A shows a detail view of a side with recesses according to a second exemplary embodiment in the first condition,

figure 4B shows a detail view of the side with recesses of figure 4A in the second condition,

figures 5A and 5B show a schematic side view and cross-section of an assembly comprising a product carrier in the first condition and a lifting device,

figures 6A and 6B show a schematic side view and cross-section of the assembly of figures 5A and 5B wherein the lifting device lifts at least the movable bars,

figures 7A and 7B show a schematic side view and cross-section of the assembly of figures 5A and 5B wherein at least the movable bars are moved to the second condition, and

figures 8A and 8B show a schematic side view and cross-section of the assembly of figures 5A and 5B wherein at least the movable bars are placed back in recesses of the frame in the second condition.

DETAILED DESCRIPTION OF THE DRAWINGS

Figure 1A shows a top view of an exemplary embodiment of a device for supporting dough portions 1, also called product carrier 1, according to the invention. The product carrier 1 comprises a substantially rectangular frame 2. A number of bars 3 have been placed in the frame, which bars are attached substantially parallel to each other and spaced apart from each other to a substantially rectangular cloth 4. The bars then extend substantially over the full distance between two opposing sides 5 of the frame 2. On a first side 6 of the frame, placed substantially transverse to the two opposing sides 5, the flexible cloth 4 is furthermore permanently connected to the

frame 2, preferably over the full length of the first side 6.

Figure 1A and 1B show the product carrier 1 in a first condition wherein two consecutive bars 3 are placed at a mutual distance that is smaller than the length of the cloth 4 situated between said two consecutive bars 3. As a result the flexible cloth 4, that is substantially inelastic, will sag between the two consecutive bars 3 and form a trough as schematically shown in the side view of figure 1B. In these troughs dough portions or dough pieces 7 can subsequently be placed as shown in figures 1A and 1B. In this position the dough portions are held in a stable position defined by the shape of the sagging cloth 4. The stable position of the dough portions 7 in this first condition of the product carrier 1 ensures that the dough is able to proof in a suitable manner without the process being disrupted by a movement of the dough portions.

After the proofing process has been completed, the dough portions 7 are removed from the product carrier 1. Prior to removing the dough portions 7 from the product carrier 1, the bars 3 are moved into a second condition wherein the mutual distance between two consecutive bars 3 substantially equals the length of the cloth 4 extending between the two consecutive bars 3. As a result the cloth 4 will be stretched substantially taut between the two consecutive bars 3. As a result the dough portions 7 end up on top of the tautly stretched cloth 4 as shown in the side view of figure 2B. In this condition the dough portions can easily be removed from the cloth.

As shown in more detail in figures 3A and 3B, the two opposing sides 5 are provided with series of recesses 10 that in this exemplary embodiment are regularly spaced apart. The recesses 10 are open at the top for placing the outer ends of the bars 3 therein.

As the outer ends of the bars 3 have been placed in the recesses 10, the bars are coupled to the two opposing sides 5 of the frame in a substantially fixed position within the frame. The bars 3 can be moved out of the recesses 10, for instance by lifting the bars 3 out of the recesses 10, as will be described in more detail below, for moving the bars 3 out of a first recess to another second recess 10. In that way the distance between two consecutive bars 3 is adjustable. By adjusting this distance between the consecutive bars 3 the width of the trough 11 and the extent of sagging of the cloth 4 are determined.

In the exemplary embodiment of the product carrier 1 according to the invention as shown in figure 3A and 3B the cloth 4 on a first side 6 of the frame is permanently connected to an end bar 12 which is substantially permanently connected to the frame. In this embodiment the end bar 12 is placed in a recess the opening of which is closed off by means of confining body 13. Preferably the confining body 13 is connected to the frame by means of a detachable screwed connection, as a result of which also the end bar 12, after the confining body 13 has been removed, can be taken out of the frame together with the other bars 2 and the cloth 4.

Figure 3B shows the embodiment of figure 3A, wherein the at least movable bar 3 has been moved to another recess, such that the cloth 4 between the movable bar 3 and the end bar 12, is stretched substantially taut. In that way the dough portion 7 ends up on top of the tautly stretched cloth 4 as a result of which the dough portion can easily be removed for further treatment of the dough portion.

Figures 4A and 4B show a device comparable to the one in figures 3A and 3B, the difference being that this second exemplary embodiment is provided with recesses 20 that debouch in an opening 21 in the upper side of the two opposing sides 5 of the frame, wherein

the recesses 20 have been widened towards the opening 21. If, when placing the bars 3 in the recess 20, the bars 3 are brought near the opening 21, the bars 3 will be guided to the recess 20 in question due to the shape of the opening 21.

Figures 5, 6, 7 and 8 show an assembly of a product carrier and a lifting device, wherein the lifting device is adapted for lifting the at least movable bars 3 out of the recesses for moving the bars 3 from a first condition of the product carrier 1 into a second condition of the product carrier 1, or vice versa.

Figure 5A shows a product carrier 1 comprising a frame 2, on two opposing sides 5 provided with a series of regularly spaced apart recesses 10 for placing the outer ends of bars 3 therein, in between which bars a substantially rectangular cloth 4 extends. The bars 3 are attached to the cloth 4 substantially parallel to each other and spaced apart from each other. Furthermore the cloth 4 is permanently attached to the frame 2 on a first side 6.

Figure 5B shows a schematic view in cross-section along the line I-I of figure 5A. As shown in figure 5B the outer ends 31 of the bars 3 extend to beyond the opposing sides 5, as a result of which said outer ends 31 can be engaged by a lifting device 40 that is placed adjacent to the two opposing sides 5 of the frame 2. On each side of the two opposing sides 5 of the frame 2, the lifting device 40 is provided with a guide 41 that can be movably driven substantially in vertical direction by the cylinders 42.

When moving the guide 41 upwards, the at least movable bars 3 will be lifted out of the recesses 10 by the guide 41 to above the two opposing sides 5 of the frame. The at least movable bars 3 are now situated on top of the substantially straight guide 41 and are movable along said guide 41, as shown in figures 6A and

6B, wherein figure 6B shows a schematic view in cross-section along the line II-II of figure 6A.

For moving the at least movable bars 3 from the first condition as shown in figure 5A to a second condition, as shown in figure 8A, the at least movable bars 3 are moved away from the first side 6. For that purpose the assembly comprises a displacement device having an engagement device 50 for engaging an outer end 51 of the cloth 4 extending away from the first side 6 of the frame 2. After the cloth 4 has been pulled taut by the engagement device 50, as shown in figure 7A, the lifting device 40 is able to lower the at least movable bars 3 into the new recesses 10 as shown in figure 8A. As a result the product carrier 1 has thus been brought into the second condition, in which the cloth 4 is stretched substantially taut for removing dough portions from the cloth 4.

Figure 7B shows a schematic view in cross-section along the line III-III of figure 7A, and figure 8B shows a schematic view in cross-section along the line IV-IV of figure 8A.

After the dough portions have been removed from the product carrier 1, the product carrier is transported further in the assembly for treating dough products, preferably in said second condition, to a cleaning station, wherein the cloth 4 is cleaned, for instance by brushes and/or a washing device. Subsequently the product carrier including cleaned cloth are passed back to the beginning of the device for dough treatment, and the substantially movable bars 3 are placed in a first condition as shown in figure 5A, after which the product carrier is ready for receiving dough portions again.

Summarising the invention thus relates to a product carrier for dough portions comprising: a frame, a cloth, a number of bars that are attached to the cloth substantially parallel to each other and spaced apart from each other. The bars extend over the full

distance between two opposing sides of the frame. In a first condition two consecutive bars are coupled to the frame at a mutual first distance that is smaller than the length of the cloth between said bars, and in a second condition are coupled to the frame at a mutual second distance that substantially equals the length of the cloth between said bars. On the two opposing sides the frame is provided with series of recesses that are open at the top for placing the outer ends of the two consecutive bars therein, wherein at least one of the bars is detachably coupled to the frame.

The above description is included to illustrate the operation of preferred embodiments of the invention and not to limit the scope of the invention. Starting from the above explanation many variations that fall within the spirit and scope of the present invention will be evident to an expert.

Claims

1. Device for supporting dough portions comprising:

a substantially rectangular frame,

a substantially rectangular cloth, and a number of bars that are attached to the cloth substantially parallel to each other and spaced apart from each other, wherein the bars substantially extend over the full distance between two opposing sides of the frame,

wherein the bars with their outer ends are movably coupled to the two opposing sides of the frame,

wherein two consecutive bars in a first condition of the device in a first position are coupled to the frame at a mutual first distance between the two consecutive bars, wherein the mutual first distance is smaller than the length of the cloth extending between said bars,

wherein the two consecutive bars in a second condition of the device, in a second position are coupled to the frame at a mutual second distance between the two consecutive bars, wherein the mutual second distance substantially equals the length of the cloth extending between said bars,

characterised in that the frame on the two opposing sides is provided with a series of recesses that are open at the top for placing the outer ends of the two consecutive bars therein at the mutual first or second distance, wherein one or more of the bars is

detachably placed in two opposing recesses of the frame.

2. Device according to claim 1, wherein the bars are detachably coupled to the frame.

3. Device according to claim 1 or 2, wherein on a first side of the frame placed transverse to the two opposing sides, the cloth is permanently connected to the frame.

4. Device according to claim 1 or 2, wherein on a first side of the frame placed transverse to the two opposing sides, the cloth is permanently connected to an end bar, wherein the end bar is substantially location-fixedly connected to the frame.

5. Device according to any one of the preceding claims, wherein the outer ends of at least the movable bars are adapted for a lifting device engaging thereon for lifting at least the movable bars out of the recesses.

6. Device according to any one of the preceding claims, wherein the series of recesses is adapted for placing at least the two consecutive bars in several different mutual first distances wherein the cloth between the two consecutive bars sags and forms a trough.

7. Device according to claim 6, wherein the series of recesses comprises several recesses within the length of the cloth between the two consecutive bars.

8. Device according to any one of the preceding claims, wherein the series of recesses comprises several regularly spaced apart recesses.

9. Device according to any one of the preceding claims, wherein each of the recesses debouches in an opening in an upper side of the frame, wherein the recesses are widened towards the opening.

10. Assembly for dough treatment comprising a device for supporting dough portions according to any one of the preceding claims.

11. Assembly according to claim 10, further comprising a lifting device for lifting the outer ends of at least the movable bars out of the recesses.

12. Assembly according to claim 11, wherein the lifting device comprises a substantially straight guide that lifts the outer ends of at least the movable bars out of the recess to above an upper side of the two opposing sides, wherein the guide is adapted for carrying the outer ends of at least the movable bars and for guiding the outer ends of at least the movable bars along the guide at least during moving the bars from the first to the second position, or vice versa.

13. Assembly according to claim 11 or 12, further provided with a displacement device, wherein the displacement device comprises an engagement device for engaging one or more of the movable bars for moving the bars from the first to the second position, or vice versa.

14. Assembly according to claim 13, when depending on claim 3 or 4, wherein the engagement device is adapted for engaging an outer end of the cloth extending away from the first side of the frame and/or for engaging a bar attached to or near the outer end of the cloth extending away from the first side of the frame.

15. Assembly according to claim 10-14, further provided with a removal device for removing the dough portions from the cloth, at least in the second condition of the device for supporting dough portions.

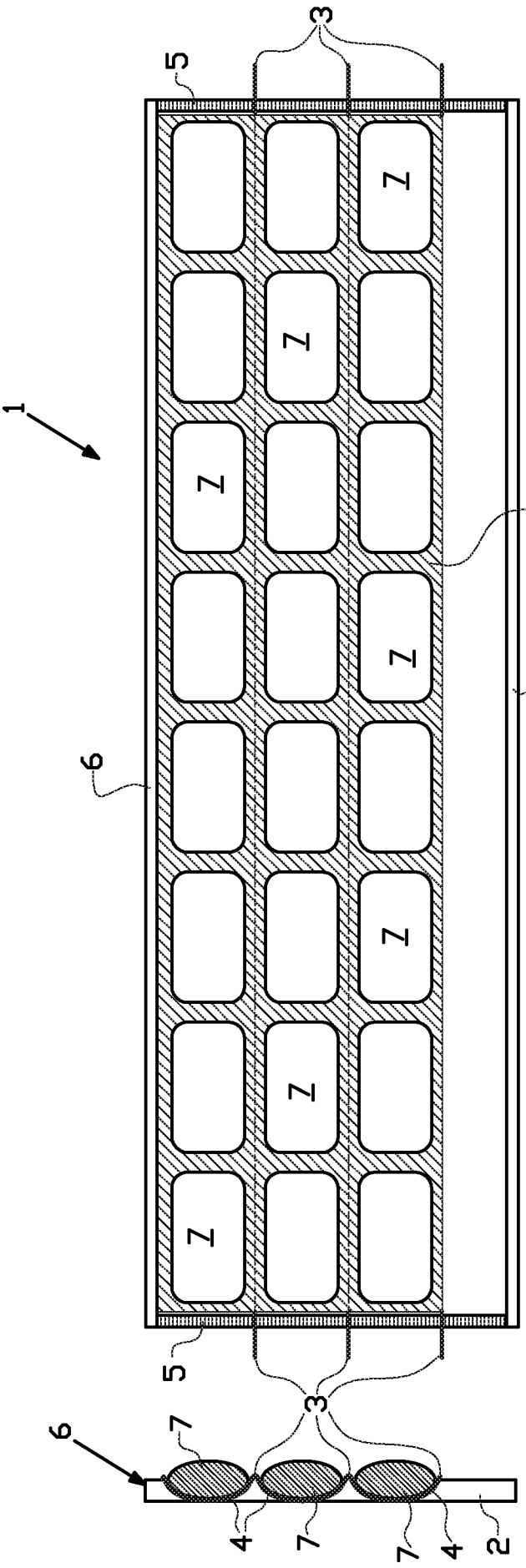

FIG. 1A

FIG. 1B

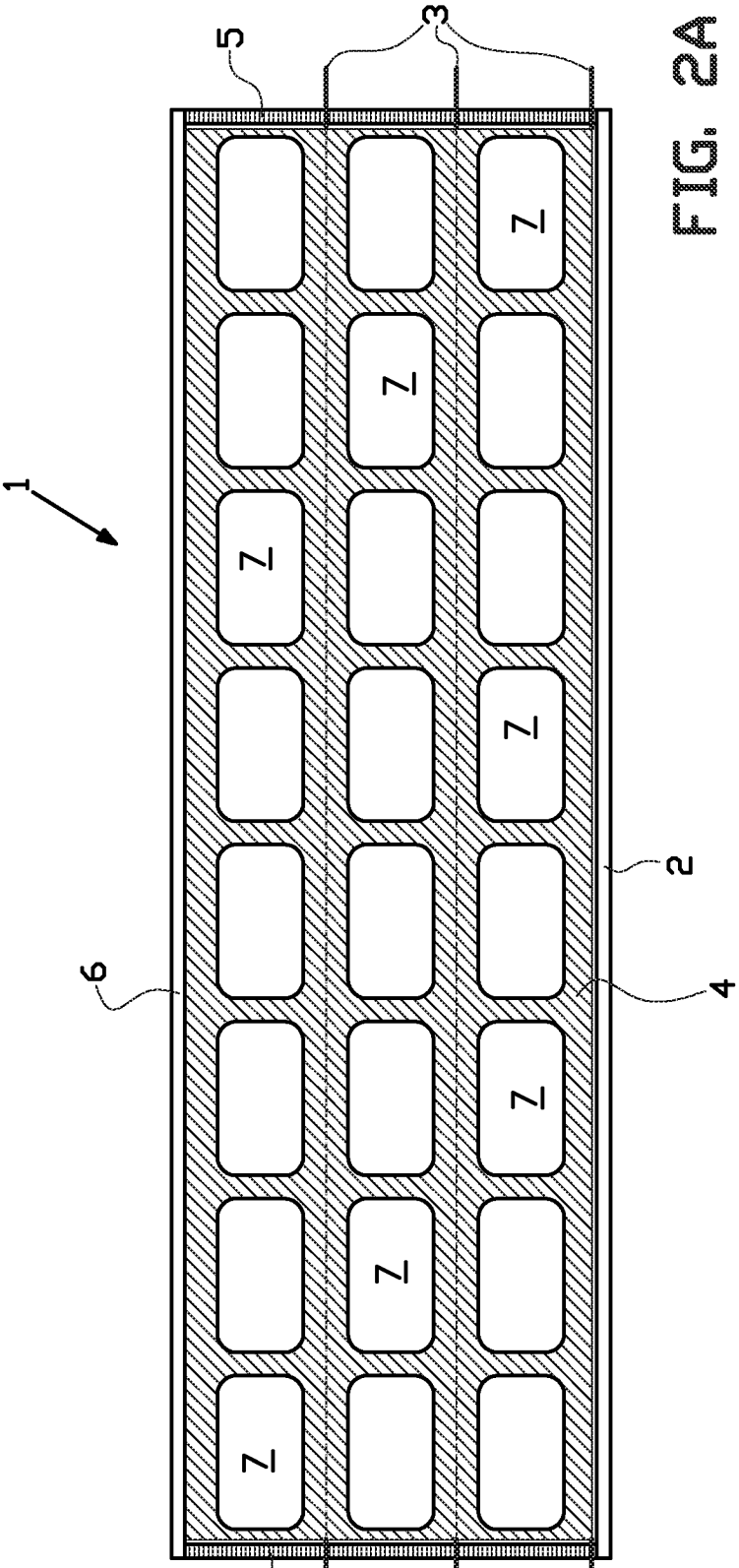

FIG. 2A

FIG. 2B

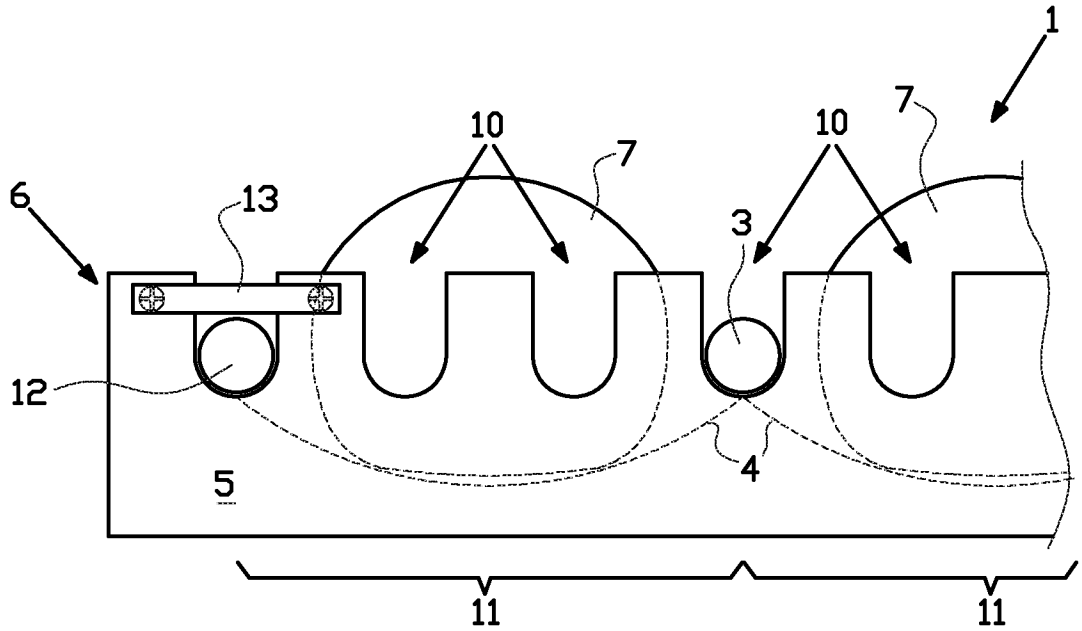

FIG. 3A

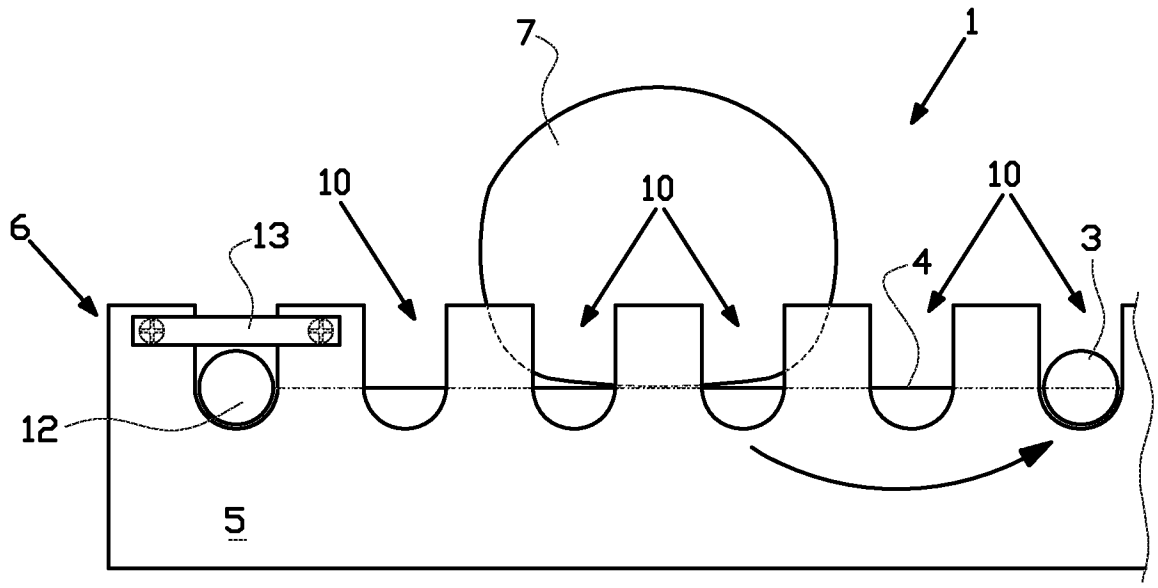

FIG. 3B

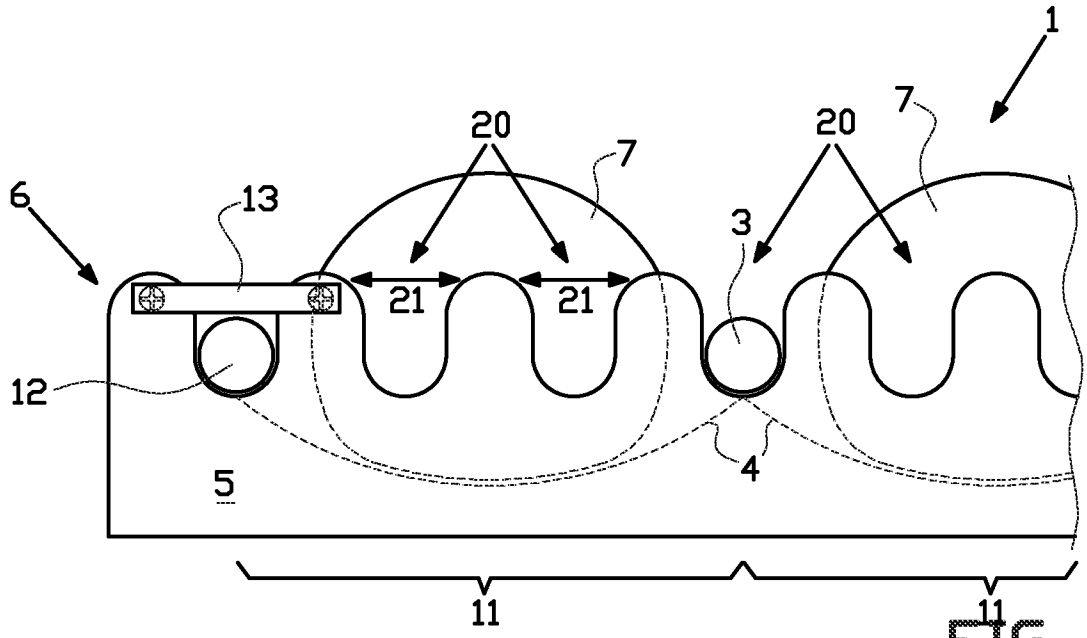

FIG. 4A

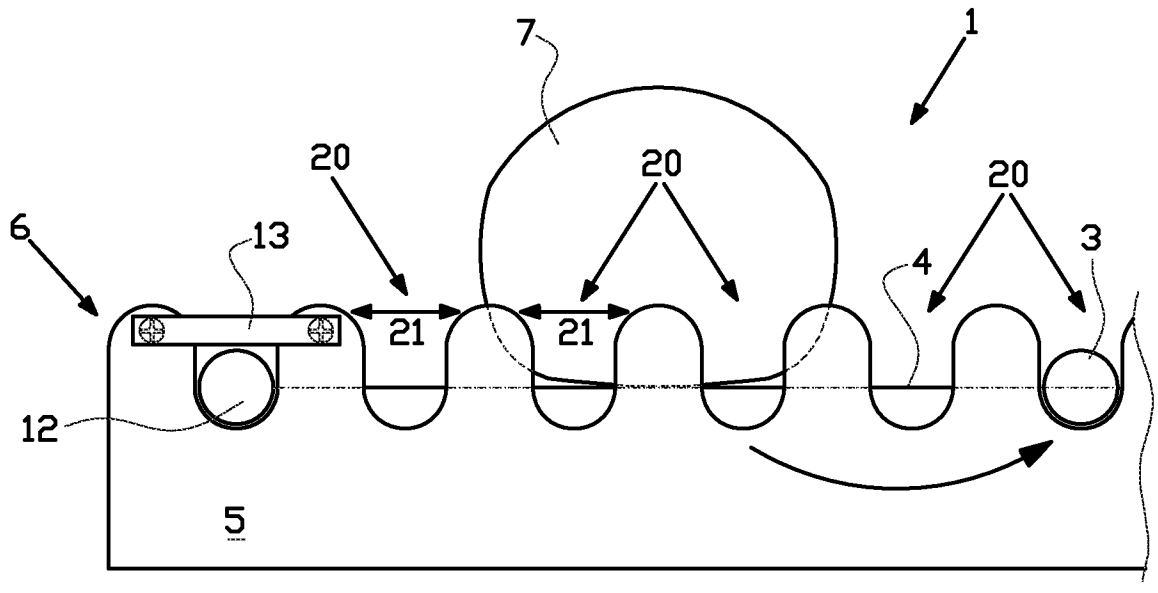

FIG. 4B

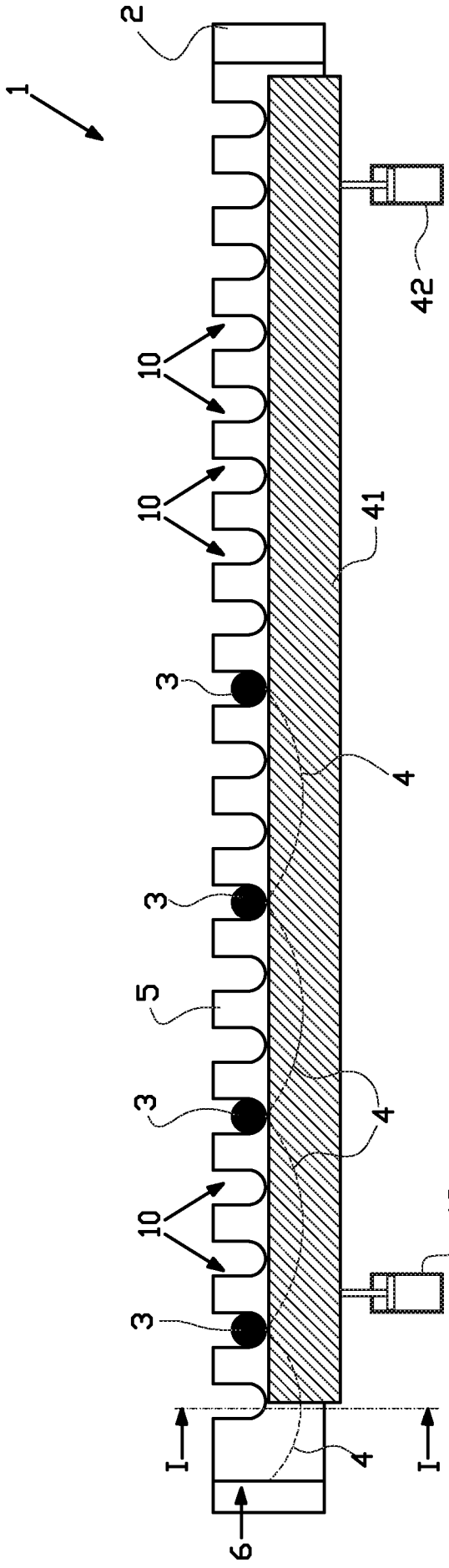

FIG. 5A

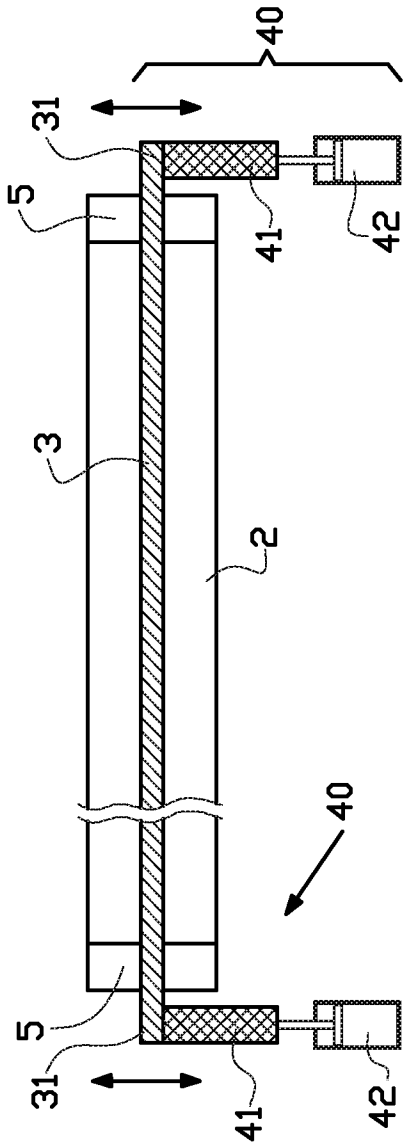

FIG. 5B

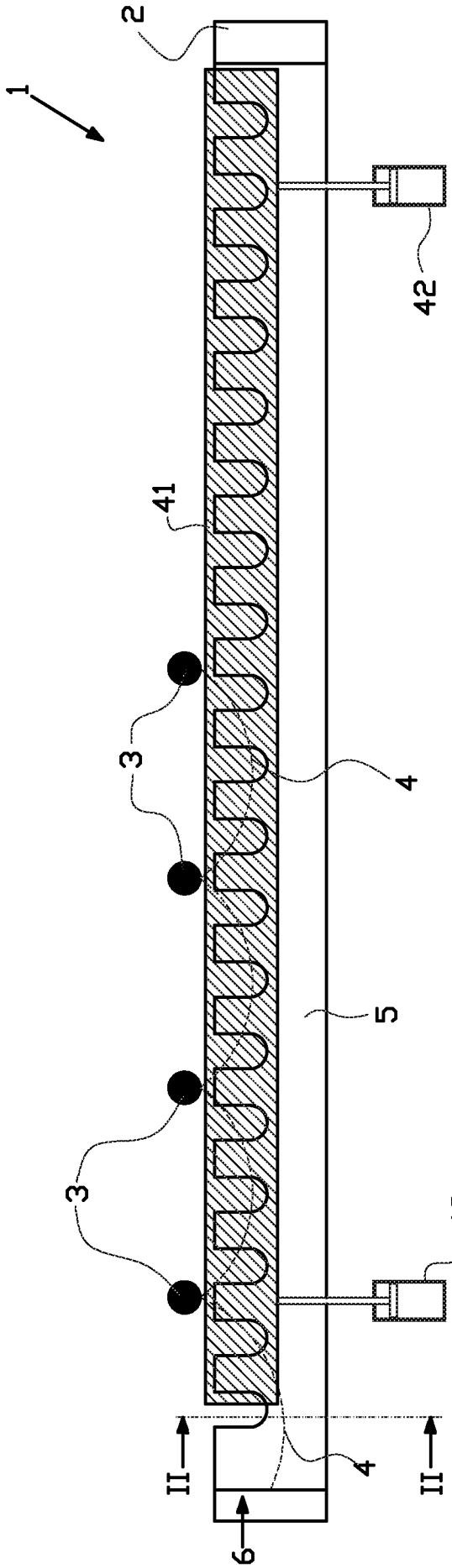

FIG. 6A

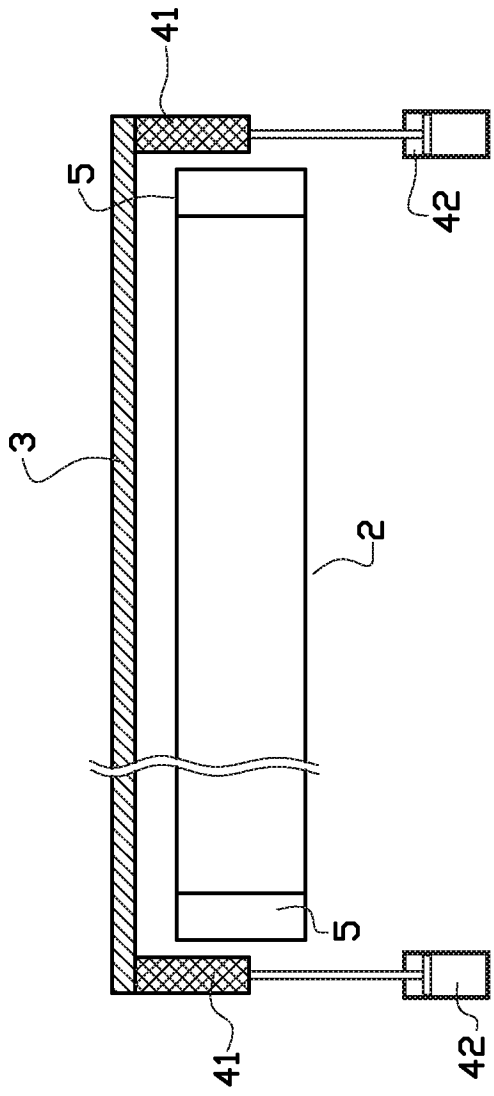

FIG. 6B

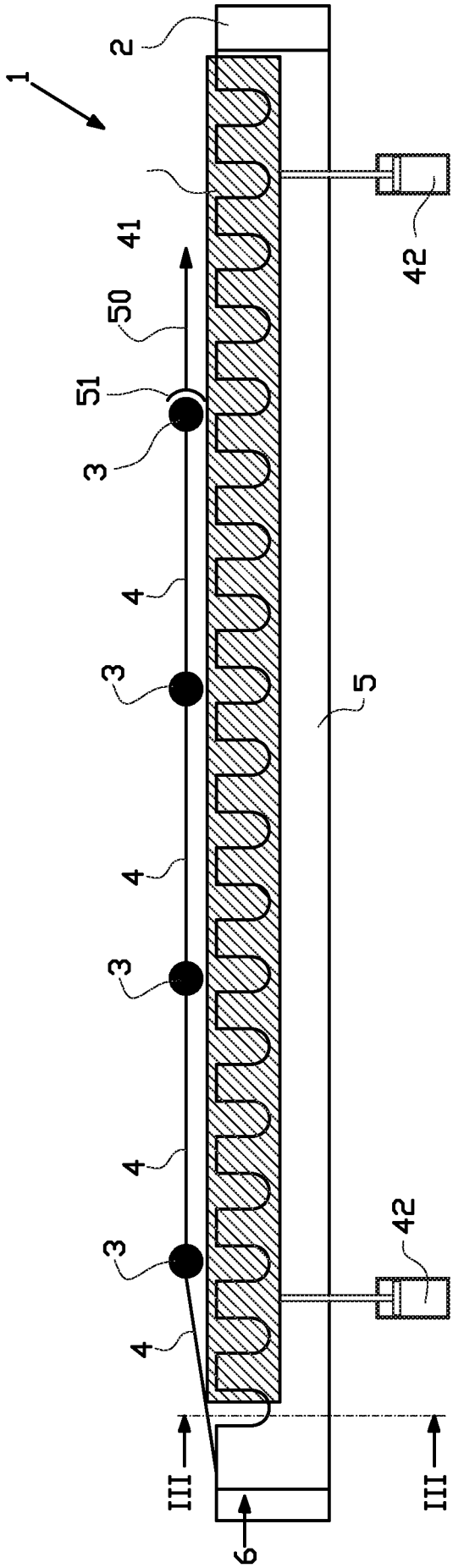

FIG. 7A

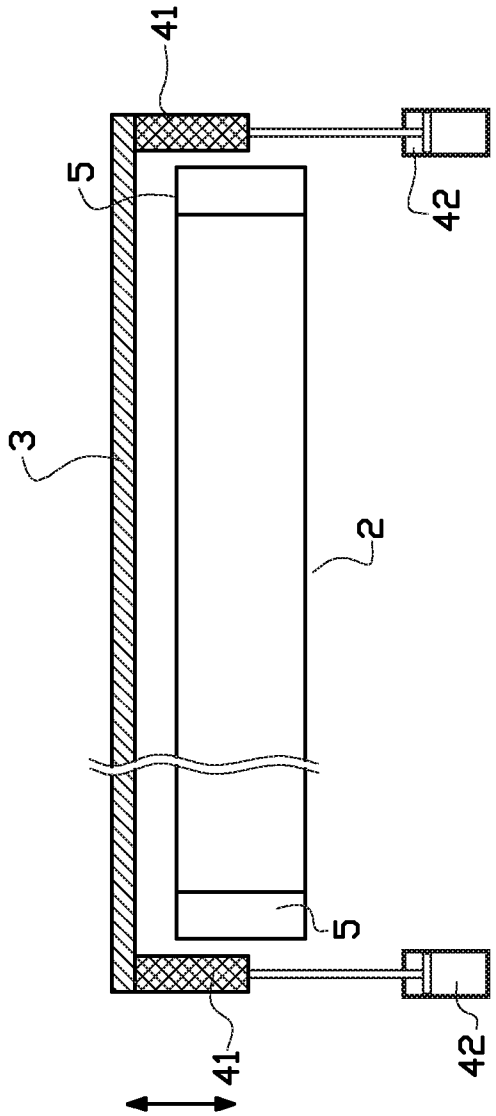

FIG. 7B

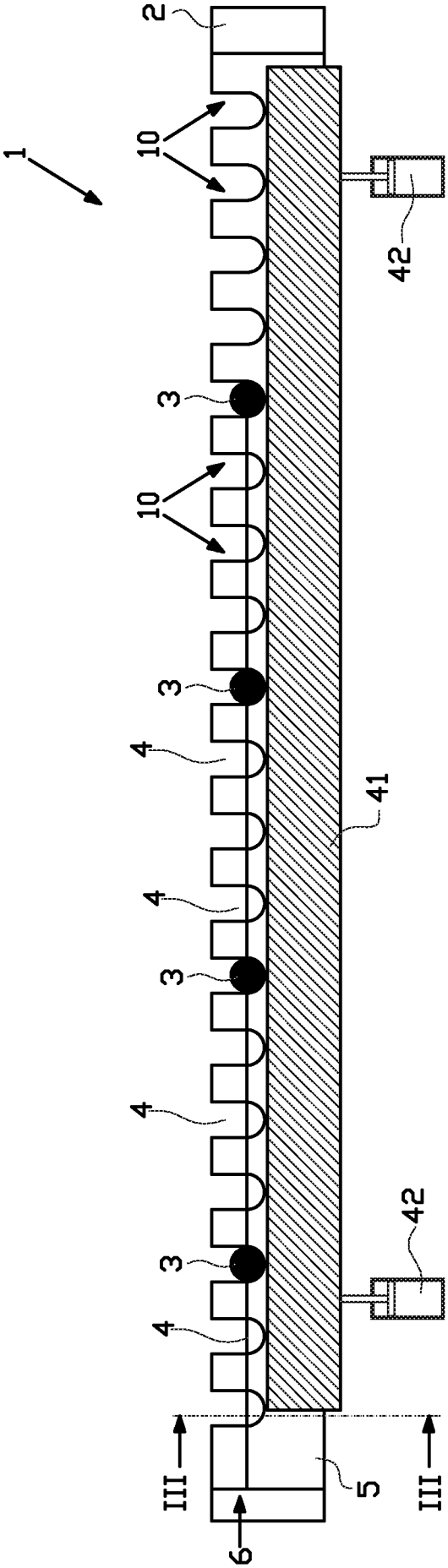

FIG. 8A

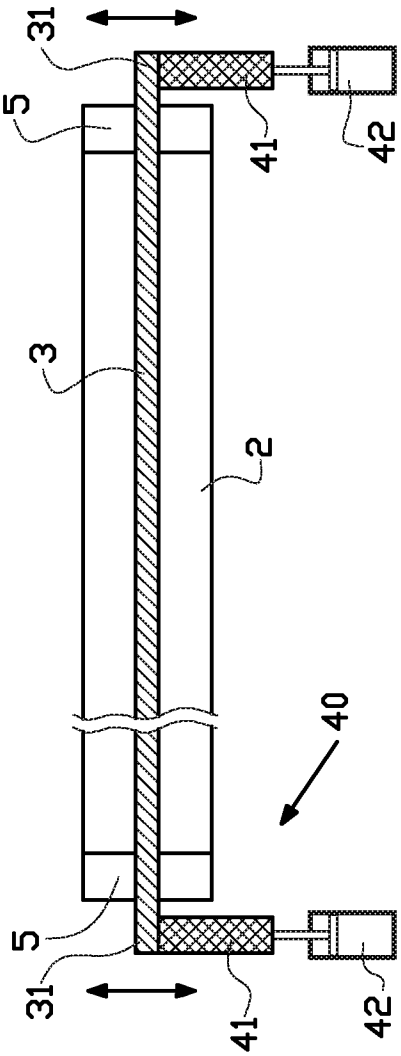

FIG. 8B

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2012/050342

A. CLASSIFICATION OF SUBJECT MATTER
INV. A21C13/00
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A21C A21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	DE 20 58 366 A1 (MICHAEL WENZ FA) 8 June 1972 (1972-06-08) page 2, line 5 - page 3, line 4; figures 1,6-8 page 3, line 12 - line 24 page 5, line 1 - line 17 page 6, line 5 - line 18	1,5-11, 13,15 4
A	DE 19 25 062 A1 (PONS HENRI) 27 November 1969 (1969-11-27) page 1, line 1 - line 6; figures 1-15 page 3, line 6 - page 4, line 5 page 6, line 5 - page 8, line 4	1,2,6
A	FR 1 325 802 A (MICHEL BOUTON) 3 May 1963 (1963-05-03) the whole document	1,2

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
2 August 2012	21/08/2012

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Hauck, Gunther

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INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2012/050342

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 1 492 884 A (ANDRÉ GOUET) 25 August 1967 (1967-08-25) cited in the application the whole document -----	1,13,15

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/NL2012/050342

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FR 1492884 A	25-08-1967	NONE	