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(54) **Mattress with fluid element**

Matratze mit Flüssigkeitselement

Matelas avec élément de fluide

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Description

[0001] The present invention refers to a bedspring or similar sprung base for supporting persons, which contains a fluid element, in particular water, and is provided for effectively, safely, reliably, hygienically and ergonomically supporting people lying thereupon.

[0002] From US-A_4292701 is known a people-supporting base assembly with fluid element, in particular water, comprising at least a fluid-filled mattress, capable of being filled with liquid medium through a filler fitting and being adapted onto support frameworks or beds and/or settees, or onto the floor, and an enhanced-flexibility mattress laid below said fluid-filled mattress, and also comprising at least another support structure that is adapted to be placed below said fluid-filled mattress and to be covered by the enhanced-flexibility mattress, said further support structure being provided with elastic means (i.e. springs) adapted to sustain people in a springly and anatomically correct manner by adapting the surface conformation of said structure in accordance with the actual weight of and the posture taken from time to time by the person (s) lying thereupon.

[0003] It is the general object of the present invention to provide an innovative kind of support bed, sofa or similar base with fluid medium, which is realized in a manner different than that disclosed by US-A-4,292,701, which enables people to be supported in an effective, reliable, safe, hygienic and ergonomic manner thereupon.

[0004] According to the present invention, the support base of the above-indicated kind incorporating the characteristics as recited and defined below with particular reference to the appended claims.

[0005] The invention will anyway be more readily understood from the description that is given below by way of non-limiting example with reference to the accompanying drawings, in which:

- Figure 1 is a schematical front view of a support base according to the present invention, in a first embodiment thereof and covered by a mattress;
- Figure 2 is a schematical front view of a component part of the support base shown in Figure 1;
- Figure 3 is a plan view of the component part shown in Figure 2;
- Figure 4 is a schematical front view of the support base shown in Figure 1, as viewed with a component part thereof in a folded state;
- Figure 5 is a schematical front view of a support base according to the present invention, in a second embodiment thereof;
- Figure 6 is a schematical front view of the support base shown in Figure 1, as set in its resting position,

in a third embodiment thereof;

- Figures 7a) and b) are views of a construction detail of the base component part shown in Figure 6, as viewed in two operating positions thereof;
- Figure 8 is a schematical front view of the support base shown in Figure 6, as set in its working position, in the state in which a person (not shown) is lying thereupon;
- Figure 9 is a schematical front view of a construction detail of the base component part shown in Figure 6, in a different embodiment thereof;
- Figure 10 is a schematical front view of a component part of a base similar to the one shown in Figure 6, but in a different embodiment thereof;
- Figure 11 is a schematical front view of the support base of Figure 6, without mattress and with a person lying thereupon;
- Figure 12 is a schematical front view of a component part of the support base according to the present invention, in a fourth embodiment thereof;
- Figure 13 is a schematical plan view of the base component part shown in Figure 12;
- Figure 14 is a schematical front view of the support base according to the present invention, in a fifth embodiment thereof;
- Figure 15 is a plan view of the support base shown in Figure 14;
- Figure 16 is a schematical plan view of a support base according to the present invention, in a sixth embodiment thereof;
- Figures 17a) and b) are schematical front and side views, respectively, of the support base shown in Figure 16.

[0006] Illustrated schematically in the above-listed Figures is a bed or similar people-support base filled with a fluid medium, such as in particular water, according to the present invention, which is adapted to support people in an effective, safe, hygienic and ergonomic manner.

[0007] As can be seen in the Figures, this support base is substantially comprised of at least two mutually superposable component parts, i.e. an underlying component parts consisting of a traditional water mattress 6, or a similar mattress filled with any other fluid medium, comprised of a case 7 made of an appropriate material, such as vinyl, fluid-tightly sealed against the outside, so as to prevent water from undesirably leaking or seeping there-

from, and enclosed by an outer support structure of a rigid material (not shown), and an overlying support structure 8, in which there is incorporated a plurality of moving, vertically displacing support members 9, and which is intended to support one or more persons, under interposition of a mattress 10 that can be laid upon the outer top surface of the same support structure for enhanced flexibility.

[0008] The water-containing case 7 is provided in a generally quadrangular shape (although this is not a prerequisite, since other shapes are possible, as well) and is sized so as to be capable of adapting to and being removably placed on bedsteads or similar bed and/or sofa support frameworks (not shown), or even directly on the floor, and is configured to include one or more inner chambers (not shown), which communicate with each other and are adapted to be filled - through a filling orifice 11 with related sealing filler cap provided on a side - with pre-determined amounts of water as required to ensure an effective support for people lying down upon this support base.

[0009] Figures 1 through to 4 illustrate a first embodiment of the support base according to the present invention; in particular, in Figure 1 there can be noticed that the support base itself is comprised of the water mattress 6, the support structure 8, which can be of the elastic or non-elastic type and has the same shape and size as the water mattress 6 so as to be able to be placed upon the latter, and the overlying enhanced-flexibility mattress 10. In particular, the support structure 8 is substantially comprised of an outer covering 12 of a suitable material, which is stuffed internally with flexible and transpiring semi-rigid material, such as preferably polyurethane foam, and encloses the afore-cited moving, vertically displacing support members 9 that are provided in a juxtaposed, i.e. side-by-side arrangement, slightly spaced from each other, in the longitudinal and lateral direction of the support structure 8. Each such moving support member 9 is preferably made of plastics and substantially comprises a short rectilinear and equally long vertical stem 13, whose length is shorter than the height of the support structure 8, and whose ends join both to a respective mushroom-shaped, i.e. fungiform head 14 and 15 having a hemispherical outline and a limited height so as to define a larger surface, wherein said stems are received in corresponding through-bores (not indicated in the Figure) provided in the foam material stuffing the support structure 8, and wherein said heads are arranged symmetrically relative to each other, so that the corresponding contour in the shape of a hemispheric cap 16 and 17 of the same heads faces the outer covering 12 and lies in contact therewith. In this manner, when nobody is lying upon the top surface of the support structure 8 and no load or pressure is therefore exerted thereupon, i.e. in the resting state represented in Figures 2 and 3 in which said surface remains perfectly horizontal, all such stem-head assemblies are not displaced and keep firm and motionless in their resting position.

[0010] When somebody on the contrary lies down upon the outer top surface of the support structure 8, and then moves into different postures thereupon, the various stems and related heads of the moving support members 9 displace vertically into varying positions by following the vertical displacement of the top and bottom outer surfaces of the same support structure, thereby continuously varying also the form of the top surface of the water mattress 6 lying therebelow.

[0011] Thanks to the particular conformation of the support structure 8, which is more rigid and compact and less elastic than the water mattress 6, the assembly formed by such support structure and the water mattress 6 allows for a much prompter, smoother and softer adjustment to the posture taken each time by the person lying upon the so provided support base, thereby effectively preventing such person from possibly running the risk of taking anatomically improper postures and developing deformations or alterations of the spinal column. Moreover, owing to the body of the person resting upon the support structure 8 - and not directly upon the water mattress 6, as this has been the case hitherto - the body itself, resting in this way upon a transpiring foam material, is allowed to more effectively transpire, while - on the other hand - being effectively prevented from running any risk of coming in contact with possible water leakages from the same water mattress, thereby keeping the hygienic and ergonomic properties of the so provided support base unaltered.

[0012] In Figure 4 there can be seen that the support structure 8 is provided with such elastic characteristics as to be able to be advantageously folded with a portion 18 thereof, as shown in dashed lines in said Figure.

[0013] Illustrated in Figure 5 there is the support base according to the present invention, in a second embodiment thereof. It can be noticed that the support structure 8 is even in this case resting upon an underlying water mattress 6, wherein this support structure is however configured in a different manner as compared with the afore-described one, since it is comprised of an outer covering 12 that is stuffed internally with a very flexible material 19, such as for instance latex or the like, in which there may be possibly embedded also suspension springs in a mutually independent manner (not shown). In the lower portion of such material there is further incorporated a material of the transpiring type 20, such as for instance preferably pierced-through plastic granules or spherules featuring a marked transpiring property such as to effectively allow for an adequate transpiration of the body of the person lying thereupon, wherein such further material is distributed over one or more superposed layers for a reduced overall thickness and over the whole length of the support structure being discussed.

[0014] A third embodiment of the support base shown in Figure 1 is illustrated in Figure 6, in which there can be noticed a support structure 21 that is again resting upon an underlying water mattress 6, wherein said sup-

port structure is in this case solely comprised of a single panel 22 having a limited thickness and the same length as the underlying water mattress 6, which is made of a rigid or semi-rigid material (such as for instance wood, stratified plastics, honeycomb pressboard, or the like, without any outer covering being provided in this case in deviation from the afore-considered embodiments, wherein also such panel is further provided with a plurality of moving support members 9 made in the same way as the afore-described ones and capable of displacing vertically in corresponding through-bores (not indicated in the Figure) extending throughout the thickness of the same panel. In this case, the stems 13 of the related moving support members 9 are made of plastics, or other suitable material, so as to be able to slidably displace along the corresponding through-bores in the panel 22, wherein this sliding displacement of the stems can be facilitated by keeping the through-bores appropriately lubricated or by possibly having bushings of some suitable self-lubricating and anti-friction material properly inserted in such bores for said stems to be able to slide therewithin. In this way, upon the upper heads 14 of the moving support members 9 there is laid an enhanced-flexibility mattress (not shown), on which a person is therefore able to lie down, and in this condition the individual stem-head assemblies are thus able to displace vertically to a varying extent depending on the weight of the person lying thereupon and the particular posture that is from time to time taken by the same person resting on the mattress placed thereupon. In the condition shown in Figure 6, in which nobody is resting on the mattress, all of the upper heads 14 are at the same time and in the same manner raised upwards, whereas all of the lower heads 15 are resting against the water mattress 6 lying therebelow and are urged with the planar bottoms 23 thereof against the lower side 24 of the panel 22.

[0015] The way in which a stem-heads assembly displaces is shown in Figure 7. In particular, Figure 7a shows the stem 13 in the condition in which it is displacing downwards in the direction A, so that the upper head 14 moves until it eventually reaches its limit, i.e. end-of-displacement position by positively abutting with its planar bottom 25 against the upper side 26 of the panel 22, whereas the lower head 15 moves downwards, thereby compressing against the underlying water mattress (not indicated in the Figure) and moving away from the opposite lower side 24 of the same panel. In the condition shown in Figure 7b there can on the contrary be noticed that the stem 13 is displacing in the direction B, which is exactly the opposite of the previously considered displacement direction, so that the heads 14 and 15 move into inverted positions.

[0016] Each head 14 and 15 can be produced by the overinjection technique, i.e. moulding it over a further corresponding fungiform head 27 and 28, which is smaller in size than the head being overinjected on it and firmly joined to the respective end portions of its own stem, wherein this smaller head may either be made integral,

i.e. in a single-piece construction, with said stem or be in turn overinjected onto said stem. Furthermore, each head may be made and shaped in a variety of manners differing from the one described above by way of example, wherein it should anyway be provided with an adequately large surface in view of enabling it to establish an effective contact against the mattresses and, therefore, ensure an effective springy support to the person lying thereupon.

[0017] Illustrated in Figure 8 there is the inventive support base with all the moving support members 9 thereof displaced into different working positions, when a person is lying on the same support base, in the condition in which these moving support members rise and subside to different extents and in a different pattern in accordance with the posture taken by the person on the support base and the corresponding displacement of the surface layer of the underlying water mattress 6.

[0018] Figure 9 illustrates a moving support member 9 of the support base according to the present invention in a different embodiment thereof, in which there can be noticed that such member is even in this case comprised of an upper fungiform head 29 and a lower fungiform head 30, both of them being similar in construction to the afore-described heads of such members, wherein each such head is however joined, through a respective articulated joint 31 and 32, with a corresponding elongated rigid stem portion 33 and 34 that are rigidly connected to each other and both of them hinged by means of a pin 35 on the support structure 36 that is placed upon the water mattress and under the enhanced-flexibility mattress (neither of them being shown in the Figure, actually). Even in this case, therefore, both heads are capable of displacing vertically at the same time, i.e. concurrently, one upwards and the other downwards, depending on the postures taken and the movements made by the person lying on the mattress provided on top, and this way of displacing is allowed for by the rigid connection of the stem portions with each other and the articulated joint provided between each stem portion and the related head.

[0019] The same component part of the inventive support base as described above is illustrated in Figure 10, however in a different embodiment thereof. This component part of the support base is in this case provided in the form of a single panel 22 of a rigid material, exactly as the one described with reference to Figure 6, provided with moving support members 9 similar to the above-described ones, so that the related fungiform heads 14 and 15 of these moving support members are again protruding freely from both sides of the panel 22. As compared with the previously discussed embodiment, however, such component part is no longer provided in the form of a single-piece construction, but is rather formed as an assembly of a number of individual pieces linked with each other in the longitudinal direction and compliable into different positions, wherein each such piece is provided with said moving support members 9. In the

example being discussed, such assembly is comprised of a middle piece 37 and two side pieces 38 and 39, differing in length from each other, of which the left-hand side piece 38 forms the foot-resting portion of the bed and the right-hand side piece 39 forms the head-resting portion of the bed. The side pieces 38 and 39 can be adjusted to a higher or lower position relative to both each other and the middle piece 37 by means of electric or other actuating mechanisms that are largely known as such in the art.

[0020] Figure 11 shows a person lying on a support base of the kind described with reference to Figure 6, however not using the top mattress, wherein the panel 22 is made of prevaillingly rigid material. Shown in Figures 12 and 13 is a yet different embodiment of the support base according to the present invention, which in this case is comprised of a fluid mattress featuring a different conformation and made up substantially of a plurality of vertically displaceable moving support members 40 housed within an inner chamber 11 delimited by the outer covering 42 of the mattress and distributed all over the extension of the same mattress, wherein each such moving support member is comprised of the sole upper fungiform head 43 facing the outer covering 42 and in contact therewith, which is joined to the related short vertical stem 44 that in this case is slidably housed in an accommodation provided in a cylinder 45 therebelow, secured with its bottom against the outer covering 42. All inner chambers being defined by the various cylinders 45 are in fluid-tight communication with each other via related ducts 46 that are connected to an outer filler fitting 47 so as to be able to introduce a suitable fluid, i.e. the working liquid medium, into all such inner chambers, thereby enabling the stems 44 to slidably displace in this liquid medium with a pumping effect that causes the displacement movement of the same stems and the related fungiform heads 43 to be damped elastically. After working fluid has been filled in all of the inner chambers of the various cylinders 45, the inner chamber 41 of the mattress according to this embodiment of the present invention is evacuated, thereby making the same mattress ready for use. In this way, all heads 43 displace vertically along with the related stems 44 according to a different pattern, i.e. in a differentiated manner, when a person lies down upon the upper surface of the inventive fluid mattress being discussed, or even upon an enhanced-flexibility mattress laid thereupon, while the displacement movement of such heads and stems is damped elastically by the working fluid contained in the cylinders 45. By varying the amount of fluid introduced in the cylinders 45, the possibility is therefore given for the intensity of the elastic damping effect on the moving support members according to this embodiment thereof to be suitably varied. This elastic damping effect can be obtained also through the addition of possible springs in each such fluid-filled cylinder 45.

[0021] A fifth embodiment of the support base according to the present invention is illustrated in Figures 14

and 15, in which such support base is again comprised of a lower or bottom fluid mattress 48, which is made in the manner that shall be described in greater detail further on, and an overlying support structure 21 that is similar to the previously described one with reference to Figure 6 and, thus, comprises again a panel 22 with a plurality of moving support members 9, wherein an enhanced-flexibility mattress (not shown) may also be laid upon this support structure 21.

[0022] In this case, the fluid-filled mattress 48 is substantially comprised of a serpentine-like coiling structure 49, formed of a continuous tubular duct 50 bent in a manner as to form a sequence of rectilinear loops 51 extending over the full length of the mattress and arranged parallel to and slightly spaced from each other across the same mattress, wherein these loops are further formed so as to feature curved surfaces 52 in the bent zones thereof. One of the ends of this serpentine-like duct 49 is provided with the filler fitting 11, which is used to introduce water - or, as the case may be, any other appropriate working fluid - to completely fill the continuous inner chamber of the same entire serpentine-like duct. Even in this case, therefore, the moving support members 9 of the support structure 21 lying upon the fluid-filled mattress 48 come into contact with the upper surface of the latter while displacing vertically in different manners and to different extents depending on the weight of and the posture taken by the person lying upon the support structure 21, or the mattress possibly placed thereupon, so as to perform the same springing function as described hereinbefore.

[0023] A sixth embodiment of the support base according to the present invention is finally illustrated in Figures 16 and 17. As it can be readily noticed, the support base is in this case formed solely of a water mattress 53 of a traditional kind - capable of being internally filled with water or other suitable fluid, as the case may be, through the related filler fitting 11 - and along the peripheral edges of this mattress there are provided and secured corresponding rigid longitudinal panels 54 and 55, as well as corresponding rigid transverse panels 56 and 57, all of them made of some suitable material, so as to stiffen the structure of the mattress, which therefore becomes self-bearing, with the possibility for it to be inserted in any support structure of beds of a traditional kind, while preventing the same structure from displacing sidewise under the weight of the person that lies down on the upper surface of the same mattress. In addition, the entire structure of the mattress 53 is further stiffened by winding appropriate binding means, such as high-strength synthetic straps that are then fastened with their ends against the peripheral panels, round the mattress. In the illustrated example, longitudinal straps 58 and 59 can be noticed to be arranged to run parallel to and slightly spaced from each other, and to be fastened with their ends against the related transverse panels 56 and 57, while transverse straps 60, 61 and 62 can in turn be noticed to run parallel to and slightly spaced from each other, and to be fastened

with their ends against the related longitudinal panels 54 and 55. These straps can be provided either externally to or internally in the support base.

[0024] The support base made and provided in the afore-described manner is therefore fully capable of effectively sustaining people lying thereupon, thanks to its relatively limited springing effect obtained with the above-described arrangements, without causing such people to undergo physical detriment, while also allowing for optimum transpiration, thereby maintaining hygienic and ergonomic characteristics at high-level qualitative standards.

Claims

1. People-supporting base assembly with fluid element, in particular water, comprising at least a fluid-filled mattress capable of being filled with liquid medium through a filler fitting and being adapted onto support frameworks of beds and/or settees, or onto the floor, and an enhanced-flexibility mattress laid upon said fluid-filled mattress, and comprising at least another support structure (8, 22, 36) that is adapted to be placed upon said fluid-filled mattress (6, 48, 53), and to be covered by the enhanced-flexibility mattress, said further support structure (8, 22, 36) being provided with elastic means (9) adapted to sustain people in a springy and anatomically correct manner by adapting the surface conformation of said structure in accordance with the actual weight of and the posture taken from time to time by the person(s) lying thereupon, **characterized in that** said elastic means (9) comprise a short rectilinear and equally long vertical stem (13), whose length is shorter than the height of said support structure (8, 22), and whose ends both join to a respective funiform or even differently shaped head (14, 15) with a large contact surface against said outer covering (12), said stem (13) being received in a corresponding through-bore provided in the material stuffing of said support structure (8, 22), and being further capable of displacing vertically, along with said heads (14, 15) into different positions by following the vertical displacement of the top and bottom outer surfaces of the same support structure, and said heads (14, 15) being arranged symmetrically relative to each other facing said outer covering (12) in contact therewith.
2. Support base assembly according to claim 1, **characterized in that** said further support structure (8) is comprised of an outer covering (12) made of an appropriate material and stuffed internally with a flexible and transpiring semi-rigid material, such as preferably polyurethane foam, enclosing said elastic means (9).
3. Support base assembly according to claim 1, **characterized in that** said further support structure (8) is comprised of an outer covering (12) stuffed internally with a highly flexible material (19), such as for instance latex or the like, in which there can also be embedded possible suspension springs of a traditional kind in a mutually independent arrangement, said flexible material (19) incorporating in the lower portion thereof a further material of the transpiring kind (20), such as for instance preferably pierced plastic granules or spherules, for improved transpiration, such material being distributed on one or more superposed layers for a relatively reduced overall thickness and over the entire length of the support structure.
4. Support base assembly according to claim 1, **characterized in that** said support structure (22) is comprised of at least a panel (22) of a limited thickness and made of a rigid or semi-rigid material, such as for instance wood, stratified plastics, honeycomb pressboard, said support structure (22) being provided with said plurality of elastic means (9).
5. Support base assembly base according to claim 4, **characterized in that** said vertical stem (13) is capable of sliding, along with said heads (14, 15), within a corresponding through-bore in said panel (22), which is provided in a thickness that is smaller than the length of said stem, and during the vertical displacement of said stem (13) said heads (14, 15) are adapted to move into abutting with the related planar bottoms (25, 23) thereof against the opposite upper and lower sides (26, 24), respectively, of said panel (22).
6. Support base assembly according to claim 4, **characterized in that** the heads (29, 30) of said elastic means (9) are joined, through a respective articulated joint (31, 32), with corresponding elongated rigid stem portions (33, 34) that are rigidly connected to each other and both of them hinged by means of a pin (35) on the support structure (36).
7. Support base assembly according to claim 4, **characterized in that** said panel (22) is comprised of a middle piece (37) and a second and third side pieces (38, 39) of the support structure, which are joined with each other in an articulated manner in the longitudinal direction and are foldable into different positions, of which said second and third side pieces (38, 39) form the foot-resting portion and the head-resting portion of the bed, respectively, said side pieces being adjustable to higher and lower positions by means of electric or other actuating mechanisms of a traditional kind.
8. Support base assembly according to claim 1, **char-**

acterized in that said fluid-filled mattress is comprised of a plurality of heads (43) joined to related vertical stems (44) provided slidably in corresponding cylinders (45), enclosed jointly with said heads (43) by an outer covering (42), said cylinders (45) communicating with each other via ducts (46) and being fillable with the desired fluid medium to differing extents so as to obtain different springing effects.

9. Support base assembly according to claim 1, **characterized in that** said fluid-filled mattress (48) is comprised of a serpentine-like coiling structure (49) formed of a continuous tubular duct (50) extending over the full length of said fluid-filled mattress (48) and bent in a manner so as to form a sequence of loops (51) arranged parallel to and slightly spaced from each other across said fluid-filled mattress (48), these loops being further formed so as to feature curved surfaces (52) in the bent zones thereof, said serpentine-like structure (48) being covered by said further support structure (22) provided with said heads (14, 15) joined to the respective vertical stem (13).
10. Support base assembly according to claim 1, **characterized in that** said fluid-filled mattress (53) is delimited and stiffened along the peripheral edges thereof by corresponding rigid longitudinal panels (54, 55) and rigid transverse panels (56, 57), thereby forming a self-bearing structure, and is externally and internally wound both lengthwise and crosswise with binding means (58, 59; 60, 61, 62) secured with the ends thereof to the corresponding transverse and longitudinal panels (56, 57; 54, 55).
11. Support base assembly according to claim 10, **characterized in that** said binding means (58, 59; 60, 61, 62) are preferably comprised of high-strength synthetic straps.

Patentansprüche

1. Menschen tragende Basisanordnung mit einem Flüssigkeitselement, insbesondere Wasser, umfassend mindestens eine flüssigkeitsgefüllte Matratze, welche mit flüssigem Medium durch ein Füllanschlussstück füllbar ist und an Tragrahmenwerke von Betten und/oder Schlafsofas oder auf dem Boden angepasst ist, sowie eine Matratze verbesserter Flexibilität, welche auf die flüssigkeitsgefüllte Matratze aufgelegt ist, und umfassend mindestens eine weitere Tragstruktur (8, 22, 36), welche auf die genannte flüssigkeitsgefüllte Matratze (6, 48, 53) auflegbar ist und durch die Matratze verbesserter Flexibilität bedeckt werden kann, wobei die genannte weitere Tragstruktur (8, 22, 36) mit elastischen Mitteln (9) versehen ist, die geeignet sind, Menschen

in einer federnden und anatomisch korrekten Weise zu tragen, indem die Oberflächenform genannter Struktur entsprechend dem tatsächlichen Gewicht und der Haltung, welche von Zeit zu Zeit durch die Person(en), die darauf liegt, anpasst, **dadurch gekennzeichnet, dass** das genannte elastische Mittel (9) einen kurzen rechteckigen und gleich langen vertikalen Stiel (13) umfasst, dessen Länge kürzer ist als die Höhe der genannten Tragstruktur (8, 22) und dessen beide Enden sich mit einem entsprechenden pilzförmigen oder sogar unterschiedlich geformten Kopf (14, 15) mit einer großen Kontaktfläche gegen genannte äußere Abdeckung (12) verbinden, wobei der Stiel (13) in einer entsprechenden durchgehenden Bohrung aufgenommen ist, die in der Materialfüllung der Tragstruktur (8, 22) vorgesehen ist und ferner fähig ist, sich vertikal längs der Köpfe (14, 15) in unterschiedliche Positionen zu verschieben, indem sie der vertikalen Verschiebung der oberen und unteren äußeren Oberflächen der gleichen Tragstruktur folgt, und wobei die Köpfe (14, 15) symmetrisch zueinander angeordnet sind und der äußeren Abdeckung (12) in Kontakt mit dieser gegenüber liegen.

2. Tragbasisanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die weitere Tragstruktur (8) aus einer äußeren Abdeckung (12) besteht, welche aus einem zweckdienlichen Material hergestellt und innen mit einem flexiblen und durchlässigen halbstarren Material, wie beispielsweise bevorzugt Polyurethanschäum, ausgestopft ist, welche genannte elastische Mittel einschließt.
3. Tragbasisanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** genannte weitere Tragstruktur (8) aus einer äußeren Abdeckung (12) besteht, welche innen mit einem hochflexiblen Material, wie beispielsweise Latex oder dergleichen, ausgestopft ist, in welchem ferner mögliche Tragfedern der traditionellen Art in voneinander unabhängiger Anordnung eingebettet sein können, wobei das genannte flexible Material (19) im unteren Teil desselben ein weiteres Material der durchlässigen Art (20) einschließt, wie beispielsweise durchlochte Kunststoffkörner oder -kugeln für die verbesserte Durchlässigkeit, wobei derartiges Material auf einer oder mehreren übereinander liegenden Schichten für eine relativ verringerte Gesamtdicke und über die Gesamtlänge der Tragstruktur verteilt ist.
4. Tragbasisanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Tragstruktur (22) aus mindestens einem Paneel (22) beschränkter Dicke besteht, welches aus starrem oder halbstarrem Material hergestellt ist, wie beispielsweise Holz, Schichtkunststoff, Wabenpresspappe, wobei die Tragstruktur (22) mit genannter Vielzahl elastischer

Mittel (9) versehen ist.

5. Tragbasisanordnung nach Anspruch 4, **dadurch gekennzeichnet, dass** genannter vertikaler Stiel (13) die Fähigkeit aufweist, zusammen mit den Köpfen (14, 15) innerhalb einer entsprechenden durchgehenden Bohrung in dem Paneel (22) zu gleiten, welche in einer Dicke vorgesehen ist, die kleiner ist als die Länge der Stiele, und wobei sich während der vertikalen Verschiebung des Stiels (13) genannte Köpfe (14, 15) in Anlage mit den dazugehörigen planaren Unterseiten (25, 23) derselben gegeneinander gegenüberliegende Ober- und Unterseiten (26 bzw. 24) des Paneels (22) zu bewegen. 5 10
6. Tragbasisanordnung nach Anspruch 4, **dadurch gekennzeichnet, dass** die Köpfe (29, 30) genannter elastischer Mittel (9) über eine Gelenkverbindung (31, 32) mit entsprechenden langgestreckten Stielabschnitten (33, 34) verbunden sind, welche miteinander starr verbunden sind, wobei beide mittels eines Stiftes (35) an der Tragstruktur (36) angelartig verbunden sind. 15 20
7. Tragbasisanordnung nach Anspruch 4, **dadurch gekennzeichnet, dass** das Paneel (22) aus einem Mittelstück (37) und einem zweiten und dritten Seitenstück (38, 39) der Tragstruktur besteht, welche miteinander gelenkig in Längsrichtung verbunden sind und in verschiedene Positionen faltbar sind, wobei die ersten und zweiten Seitenstücke (38, 39) den Fußruheabschnitt und bzw. den Kopfruheabschnitt des Betts bilden und die Seitenstücke mittels elektrischer oder anderer Betätigungsmechanismen der traditionellen Art in höhere oder niedrigere Positionen einstellbar sind. 25 30
8. Tragbasisanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die flüssigkeitsgefüllte Matratze aus einer Vielzahl von Köpfen (43) besteht, welche mit dazugehörigen vertikalen Stielen (44) verbunden sind, die gleitbar in entsprechenden Zylindern (45) angeordnet sind und gemeinsam mit den Köpfen (43) in einer äußeren Abdeckung (42) eingeschlossen sind, über Leitungen (46) in Verbindung miteinander stehen, und mit dem gewünschten flüssigen Medium in unterschiedlichen Maßen füllbar sind, um unterschiedliche Federungswirkungen zu erzielen. 35 40 45 50
9. Tragbasisanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** genannte flüssigkeitsgefüllte Matratze (48) aus einer serpentinenähnlichen Wickelstruktur (49) besteht, die aus einer durchgehenden rohrförmigen Leitung (50) geformt ist, welche sich über die Gesamtlänge der flüssigkeitsgefüllten Matratze (48) erstreckt und in einer Weise gebogen ist, um eine Sequenz von Schlaufen (51) zu 55

bilden, welche parallel zueinander und geringfügigem Abstand voneinander über die flüssigkeitsgefüllte Matratze verteilt angeordnet sind, wobei diese Schlaufen ferner derart geformt sind, dass sie gekrümmte Oberflächen (52) in ihren gebogenen Zonen bilden, und wobei die serpentinenähnliche Struktur (48) durch die weitere Tragstruktur (22), die mit den Köpfen (14, 15), verbunden mit dem entsprechenden vertikalen Stiel (13) gebildet ist, abgedeckt ist.

10. Tragbasisanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** genannte flüssigkeitsgefüllte Matratze (53) längs der Umfangskanten derselben durch entsprechende starre Längspaneele (54, 55) und starre Querpaneele (56, 57) begrenzt und versteift ist und **dadurch** eine selbsttragende Struktur bildet und außen und innen sowohl in Längsrichtung als auch in Querrichtung mit Bindemitteln (58, 59; 60, 61, 62) umwunden ist, die mit ihren Enden an den entsprechenden Quer- und Längspaneele (56, 57; 54, 55) befestigt sind. 15 20
11. Tragbasisanordnung nach Anspruch 10, **dadurch gekennzeichnet, dass** die Bindemittel (58, 59; 60, 61, 62) bevorzugt aus synthetischen Gurten hoher Festigkeit bestehen. 25

30 Revendications

1. Ensemble de base supportant des personnes avec un élément fluide, en particulier de l'eau, comprenant au moins un matelas rempli de fluide pouvant être rempli d'un milieu liquide par l'intermédiaire d'un raccord destiné au remplissage, et adapté sur des châssis de support de lits et/ou canapés, ou sur le sol, et un matelas à flexibilité accrue déposé sur ledit matelas rempli de fluide, et comprenant au moins une structure de support supplémentaire (8, 22, 36) qui est conçue de manière à être placée sur ledit matelas rempli de fluide (6, 48, 53), et à être recouverte du matelas à flexibilité accrue, ladite structure de support supplémentaire (8, 22, 36) étant dotée de moyens élastiques (9) conçus de manière à soutenir les personnes d'une manière anatomiquement correcte et élastique en adaptant la conformation superficielle de ladite structure au poids effectif et à la posture adoptée de temps à autre par la (les) personne(s) qui se trouvent dessus, **caractérisé en ce que** lesdits moyens élastiques (9) comprennent une courte tige (13) rectiligne verticale, d'une longueur régulière, dont la longueur est inférieure à la hauteur de ladite structure de support (8, 22), et dont les extrémités se rejoignent toutes les deux au niveau d'une tête (14, 15) fongiforme ou même de forme différente, respectives, avec une grande surface de contact, contre ledit revêtement externe (12), ladite 50 55

- tige (13) étant reçue dans un alésage traversant correspondant ménagé dans la garniture de matériau de ladite structure de support (8, 22), et étant en outre en mesure de se déplacer verticalement, conjointement avec lesdites têtes (14, 15), vers différentes positions en suivant le déplacement vertical des surfaces externes supérieure et inférieure de la même structure de support, et lesdites têtes (14, 15), agencées de manière symétrique l'une par rapport à l'autre, font face audit revêtement externe (12) en contact avec celles-ci.
2. Ensemble de base et de support selon la revendication 1, **caractérisé en ce que** ladite structure de support supplémentaire (8) est constituée d'un revêtement externe (12) réalisé dans un matériau approprié, et garni à l'intérieur d'un matériau semi-rigide flexible et apte à la transpiration, tel que, de préférence, une mousse polyuréthane, renfermant lesdits moyens élastiques (9).
 3. Ensemble de base et de support selon la revendication 1, **caractérisé en ce que** ladite structure de support supplémentaire (8) est constituée d'un revêtement externe (12) garni à l'intérieur d'un matériau hautement flexible (19), tel que par exemple du latex ou similaire, dans lequel peuvent également être intégrés des ressorts de suspension éventuels d'un type traditionnel selon un agencement mutuellement indépendant, ledit matériau flexible (19) incorporant, dans sa portion inférieure, un matériau supplémentaire de type transpirant (20), tel que par exemple des granules ou sphères en plastique de préférence percés, afin d'améliorer la transpiration, ce matériau étant réparti sur une ou plusieurs couches superposées de manière à obtenir une épaisseur globale relativement réduite, et sur toute la longueur de la structure de support.
 4. Ensemble de base et de support selon la revendication 1, **caractérisé en ce que** ladite structure de support (22) est constituée d'au moins un panneau (22) ayant une épaisseur limitée et réalisé dans un matériau rigide ou semi-rigide, par exemple du bois, des plastiques stratifiés, du carton comprimé en nid d'abeilles, ladite structure de support (22) étant dotée de ladite pluralité de moyens élastiques (9).
 5. Ensemble de base et de support selon la revendication 4, **caractérisé en ce que** ladite tige verticale (13) est en mesure de coulisser, conjointement avec lesdites têtes (14, 15), à l'intérieur d'un alésage traversant correspondant dans ledit panneau (22), qui est prévu en une épaisseur inférieure à la longueur de ladite tige, et, pendant le déplacement vertical de ladite tige (13), lesdites têtes (14, 15) sont conçues de manière à se déplacer en butée avec les fonds plans (25, 23) associés, contre les côtés supérieur et inférieur (26, 24), opposés, respectivement, dudit panneau (22).
 6. Ensemble de base et de support selon la revendication 4, **caractérisé en ce que** les têtes (29, 30) desdits moyens élastiques (9) sont reliées, par l'intermédiaire d'une jonction articulée (31, 32) respective, aux portions de tige (33, 34) rigides allongées correspondantes qui sont raccordées fermement l'une à l'autre, et les deux étant articulées à l'aide d'une goupille (35) sur la structure de support (36).
 7. Ensemble de base et de support selon la revendication 4, **caractérisé en ce que** ledit panneau (22) est constitué d'une pièce centrale (37) et de deuxième et troisième pièces latérales (38, 39) de la structure de support, qui sont reliées les unes aux autres d'une manière articulée dans la direction longitudinale et peuvent être repliées pour obtenir différentes positions, les deuxième et troisième pièces latérales (38, 39) formant la portion laissant reposer les pieds et la portion laissant reposer la tête du lit, respectivement, lesdites pièces latérales pouvant être ajustées à des positions plus hautes et plus basses à l'aide de mécanismes d'actionnement électriques ou autres d'un type traditionnel.
 8. Ensemble de base et de support selon la revendication 1, **caractérisé en ce que** ledit matelas rempli de fluide est constitué d'une pluralité de têtes (43) reliées aux tiges verticales (44) associées, prévues de manière coulissante dans des cylindres (45) correspondants, renfermées conjointement avec lesdites têtes (43) par un revêtement externe (42), lesdits cylindres (45) communiquant les uns avec les autres par l'intermédiaire de conduits (46) et pouvant être remplis du milieu fluide souhaité à différentes degrés afin d'obtenir différents effets de détente mécanique.
 9. Ensemble de base et de support selon la revendication 1, **caractérisé en ce que** ledit matelas rempli de fluide (48) est constitué d'une structure spiralée (49) de type serpentin, composée d'un conduit tubulaire (50) continu s'étendant sur toute la longueur dudit matelas rempli de fluide (48), et recourbée de manière à former une séquence de boucles (51) agencées parallèlement et en étant légèrement espacées l'une de l'autre tout au long dudit matelas rempli de fluide (48), ces boucles étant en outre formées de manière à présenter des surfaces incurvées (52) dans leurs zones recourbées, ladite structure de type serpentin (48) étant recouverte de ladite structure de support supplémentaire (22) dotée desdites têtes (14, 15) reliées à la tige verticale (13) respective.
 10. Ensemble de base et de support selon la revendication 1, **caractérisé en ce que** ledit matelas rempli

de fluide (53) est délimité et raidi le long de ses bords périphériques par des panneaux longitudinaux rigides (54, 55) et des panneaux transversaux rigides (56, 57) correspondants, ce qui forme une structure autoporteuse, et est enroulé, à l'extérieur et à l'intérieur, à la fois dans le sens de la longueur et dans le sens de la largeur, avec des moyens de raccordement (58, 59, 60, 61, 62) fixés, au niveau de leurs extrémités, aux panneaux transversaux et longitudinaux (56, 57, 54, 55) correspondants.

11. Ensemble de base et de support selon la revendication 10, **caractérisé en ce que** lesdits moyens de raccordement (58, 59 ; 60, 61, 62) sont de préférence constitués de brides synthétiques hautement résistantes.

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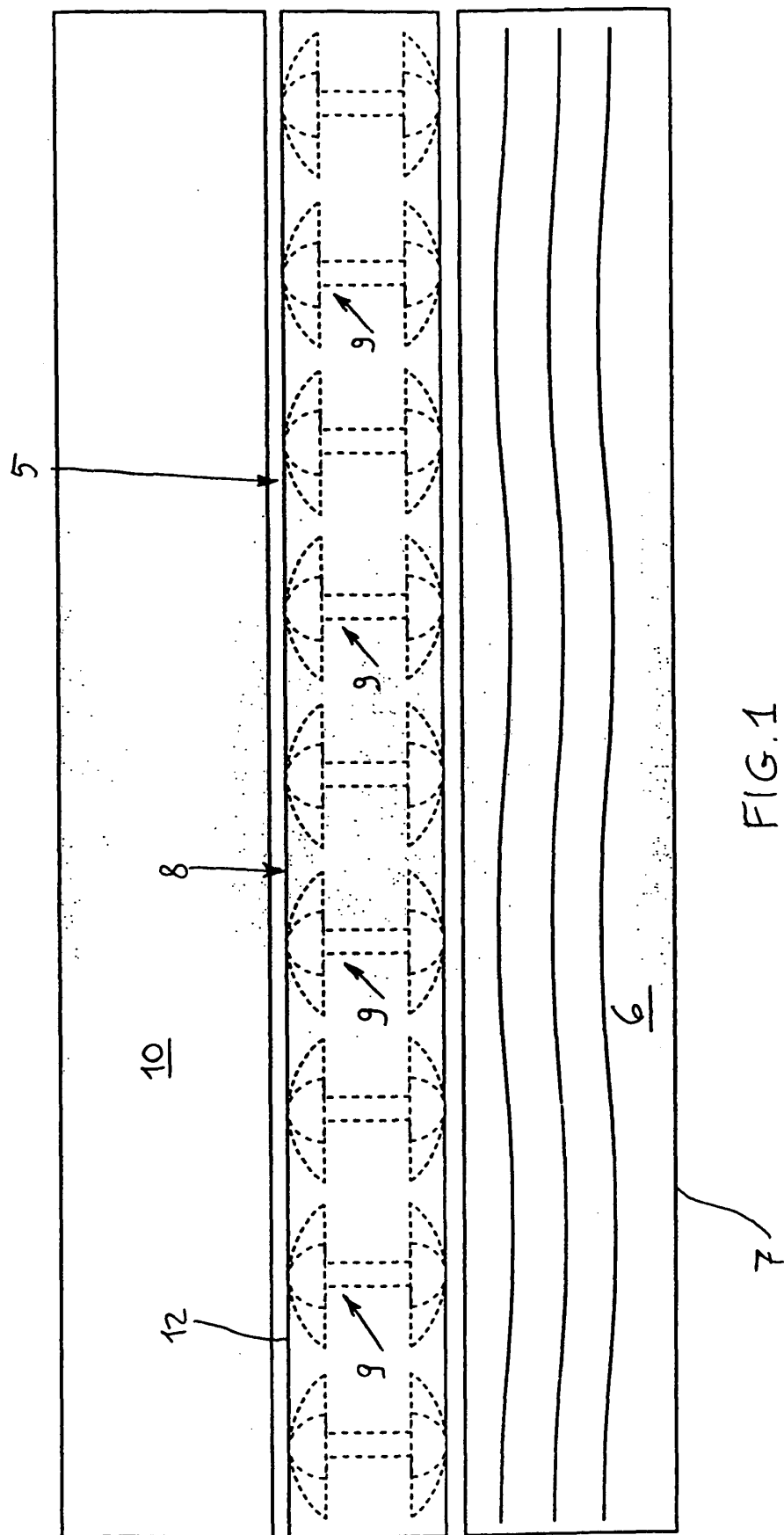
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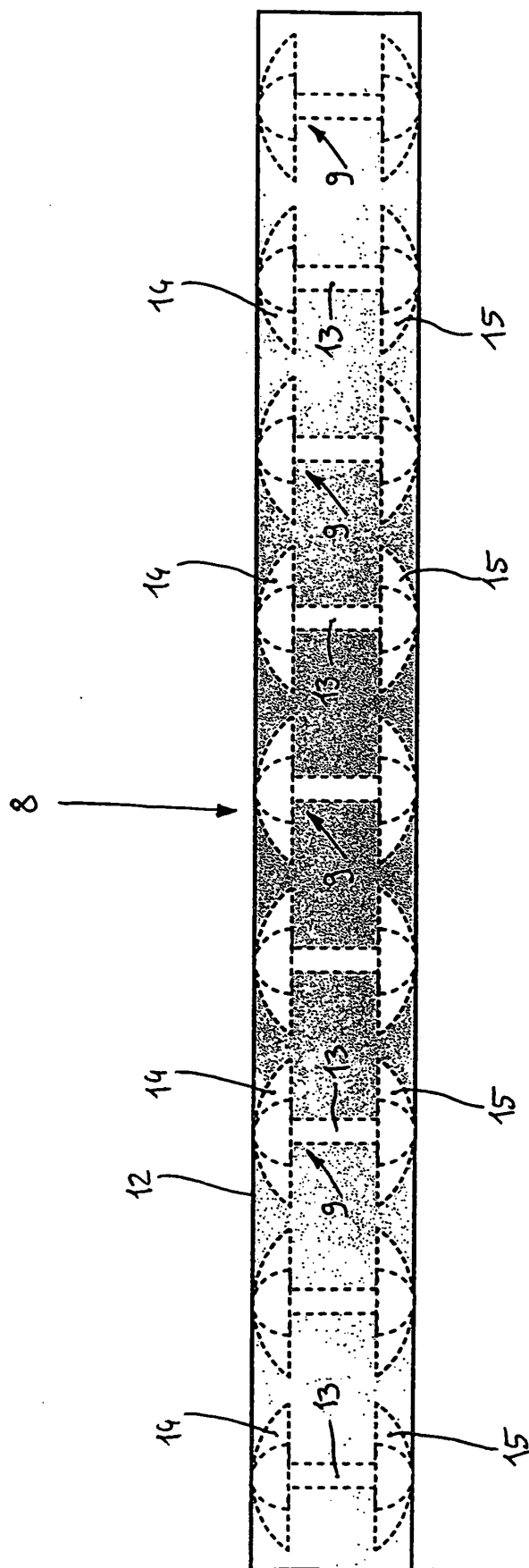


FIG. 2

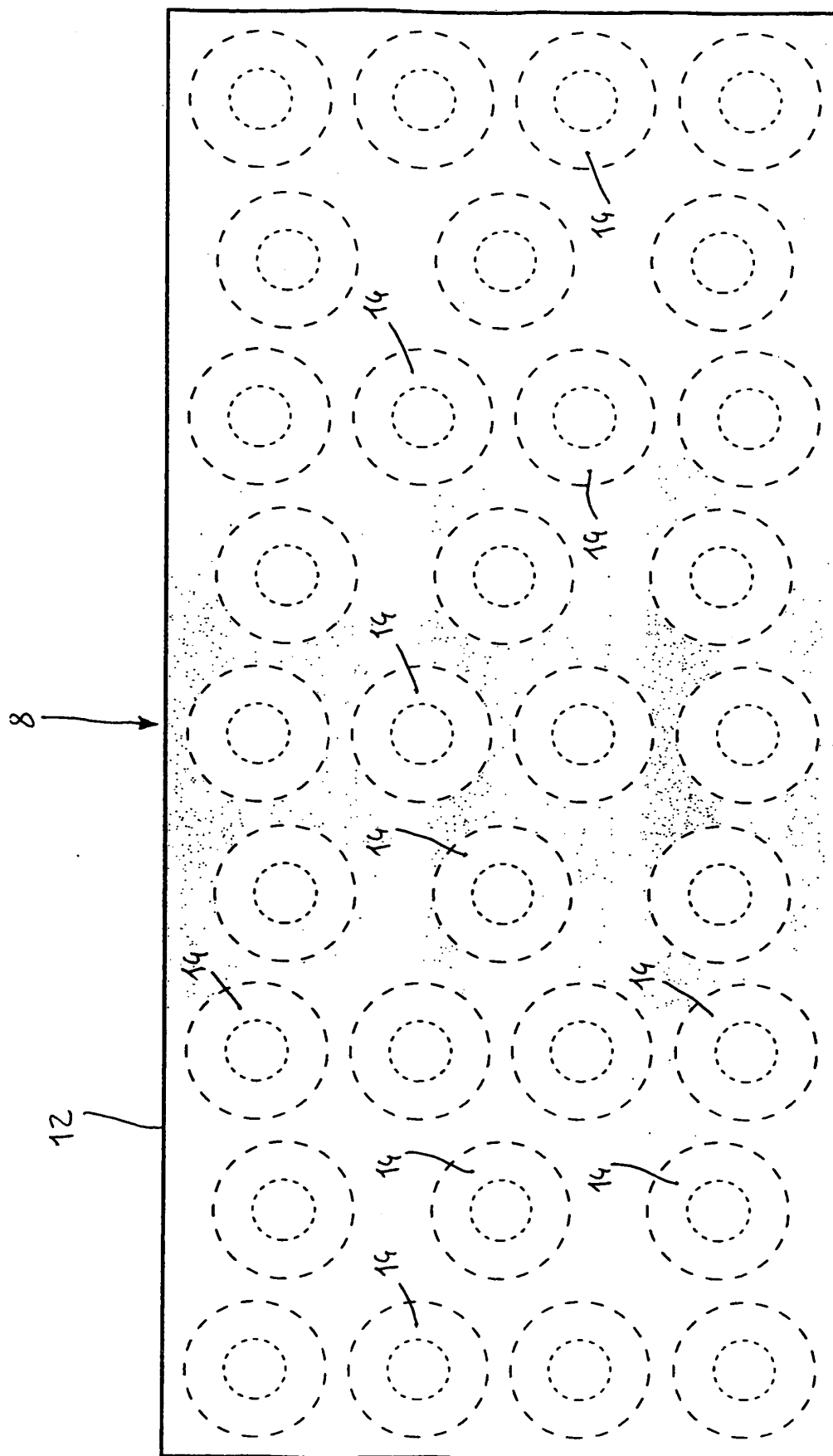
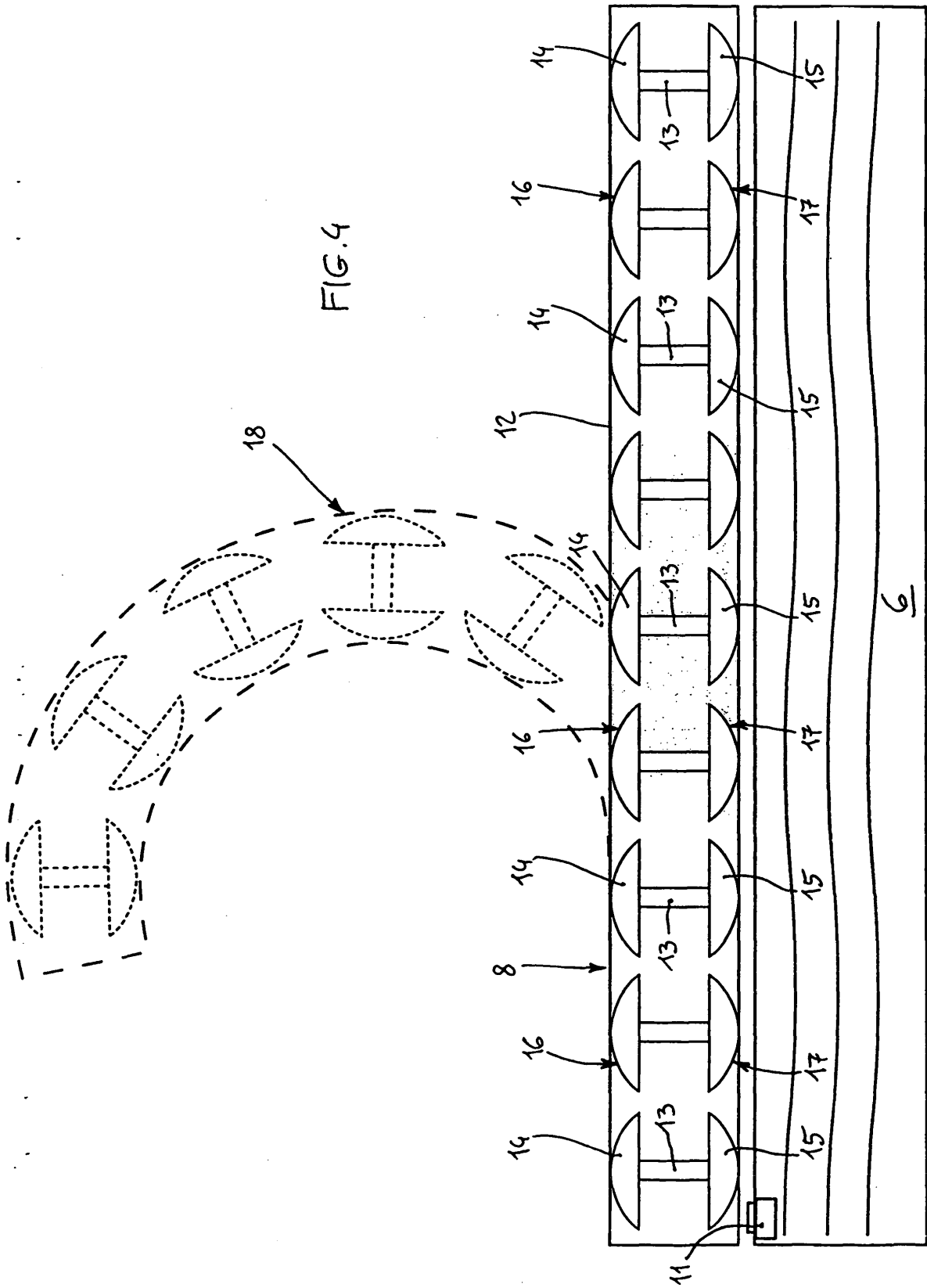


FIG. 3



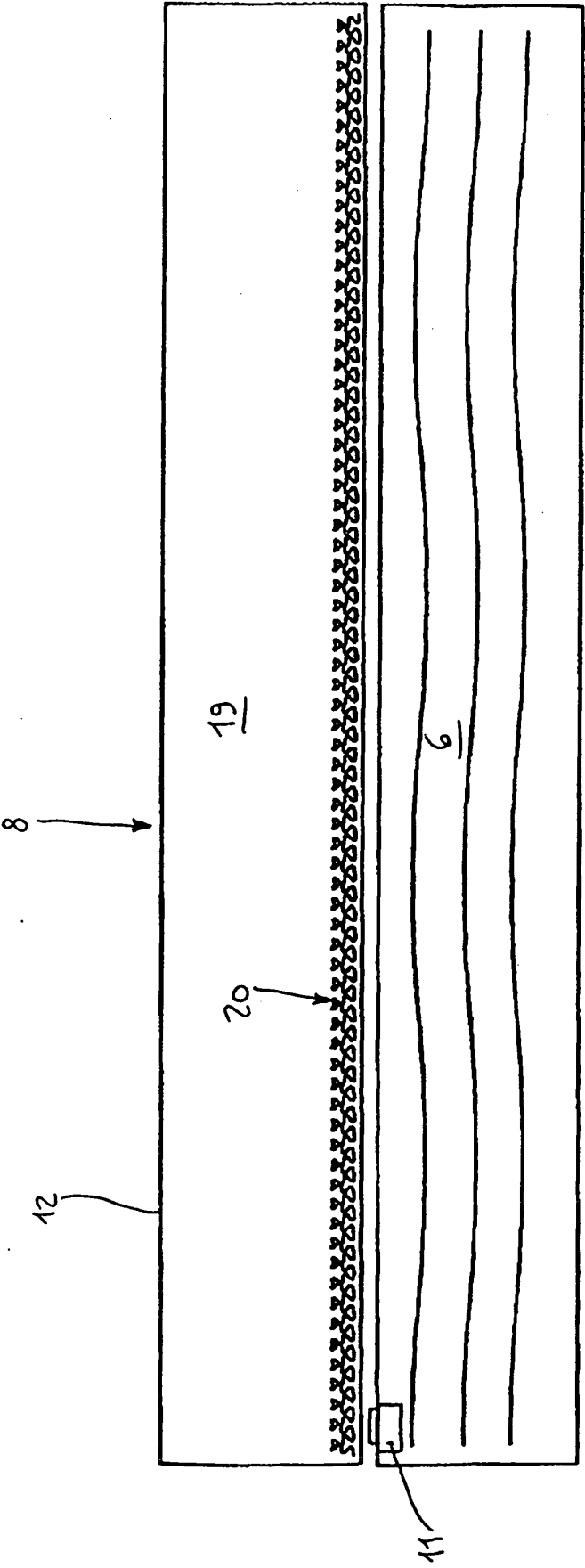


FIG. 5

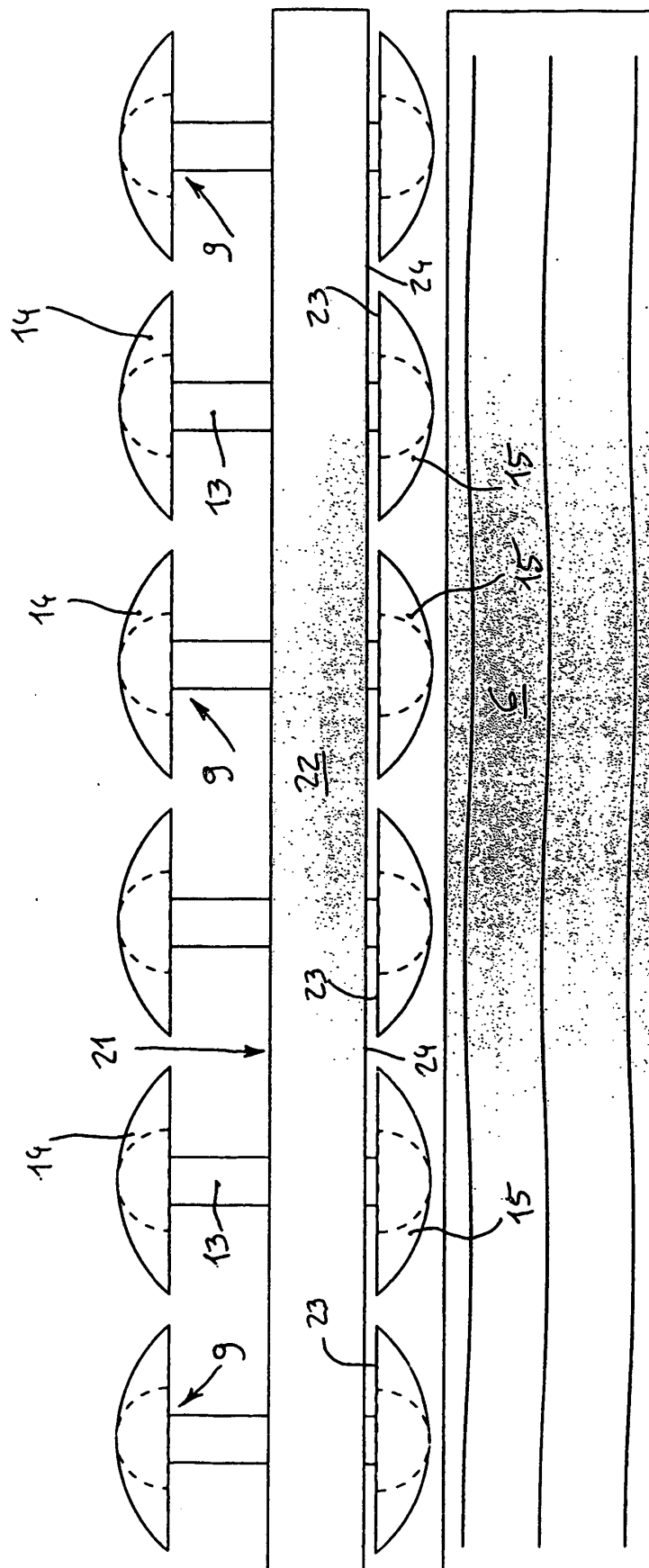
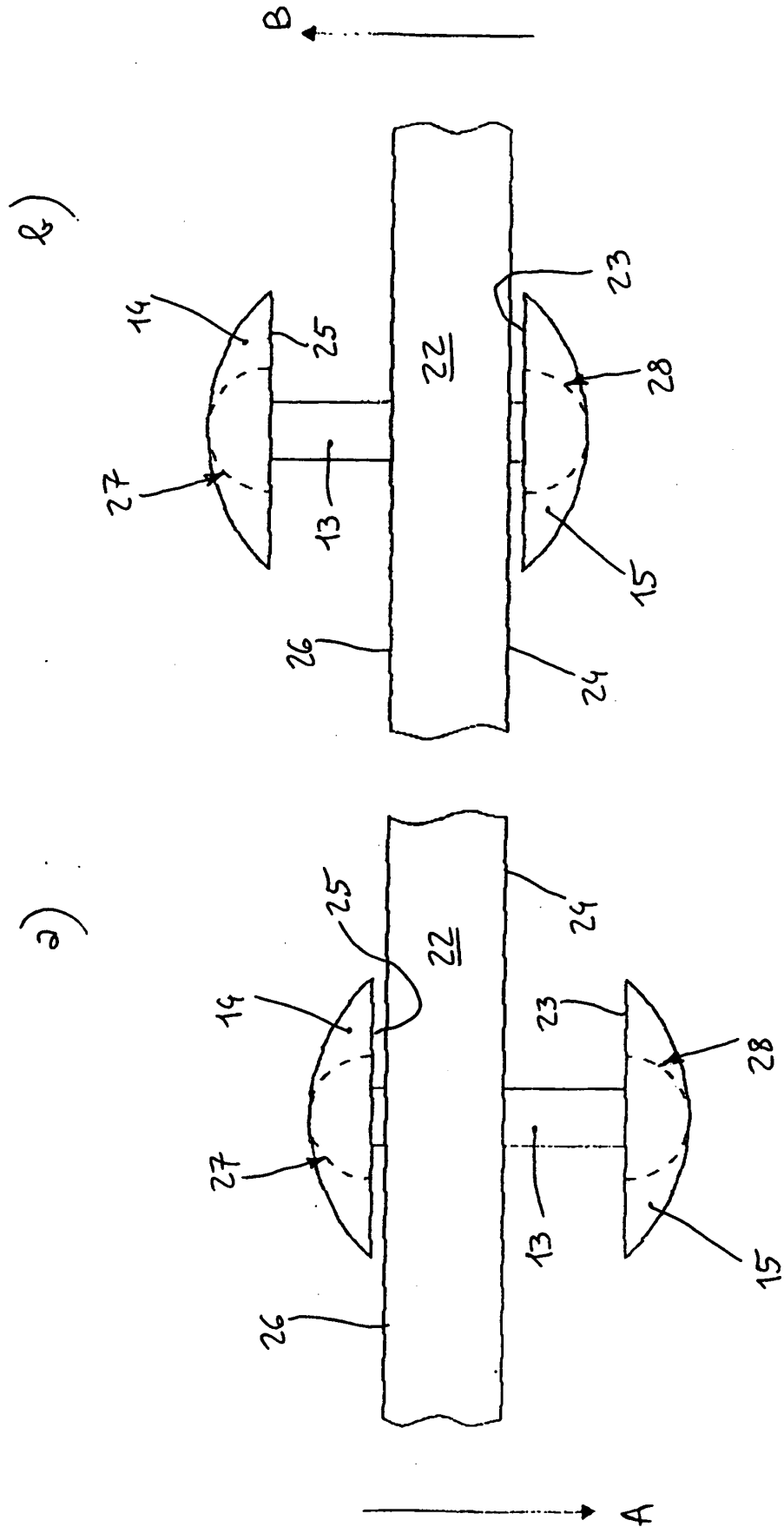
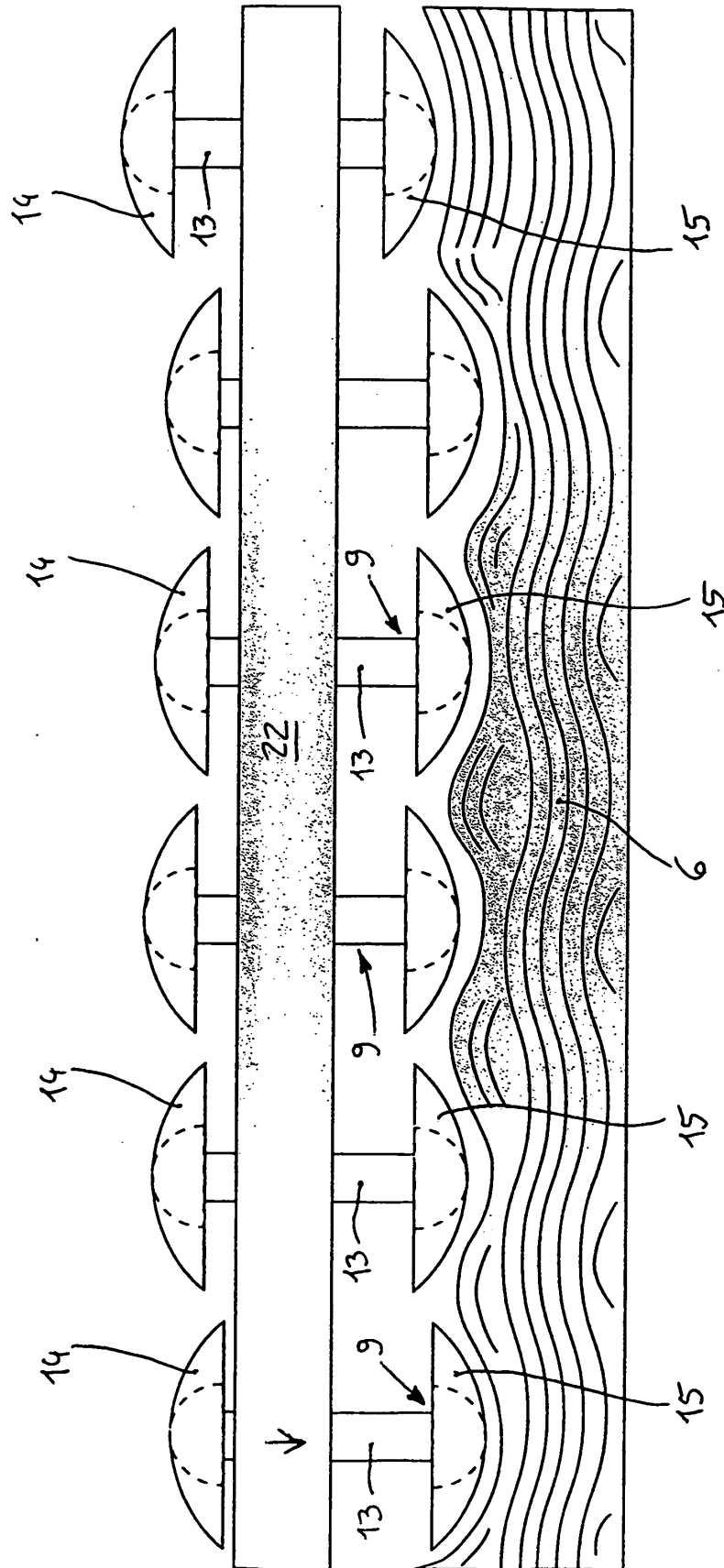


FIG. 6





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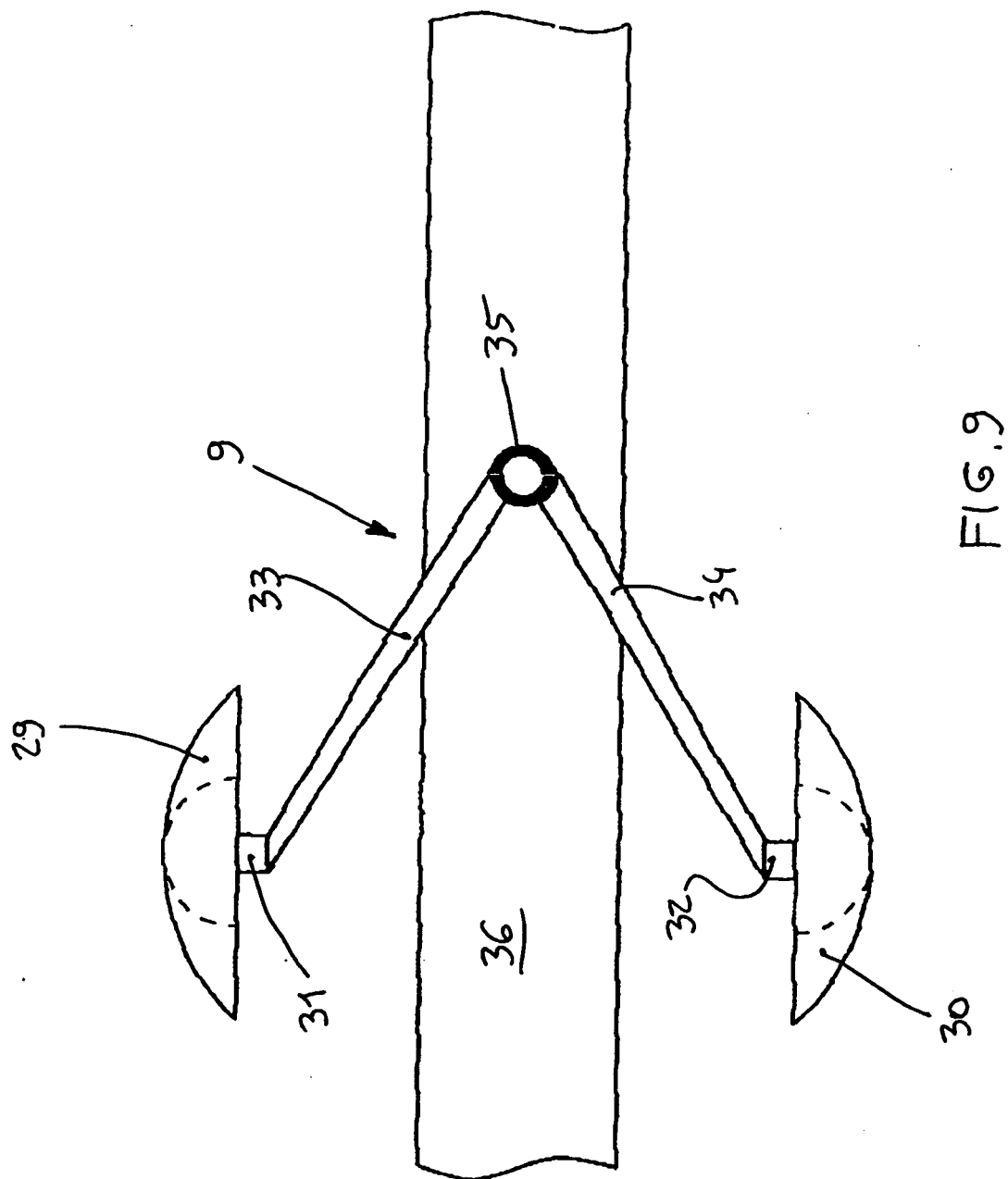
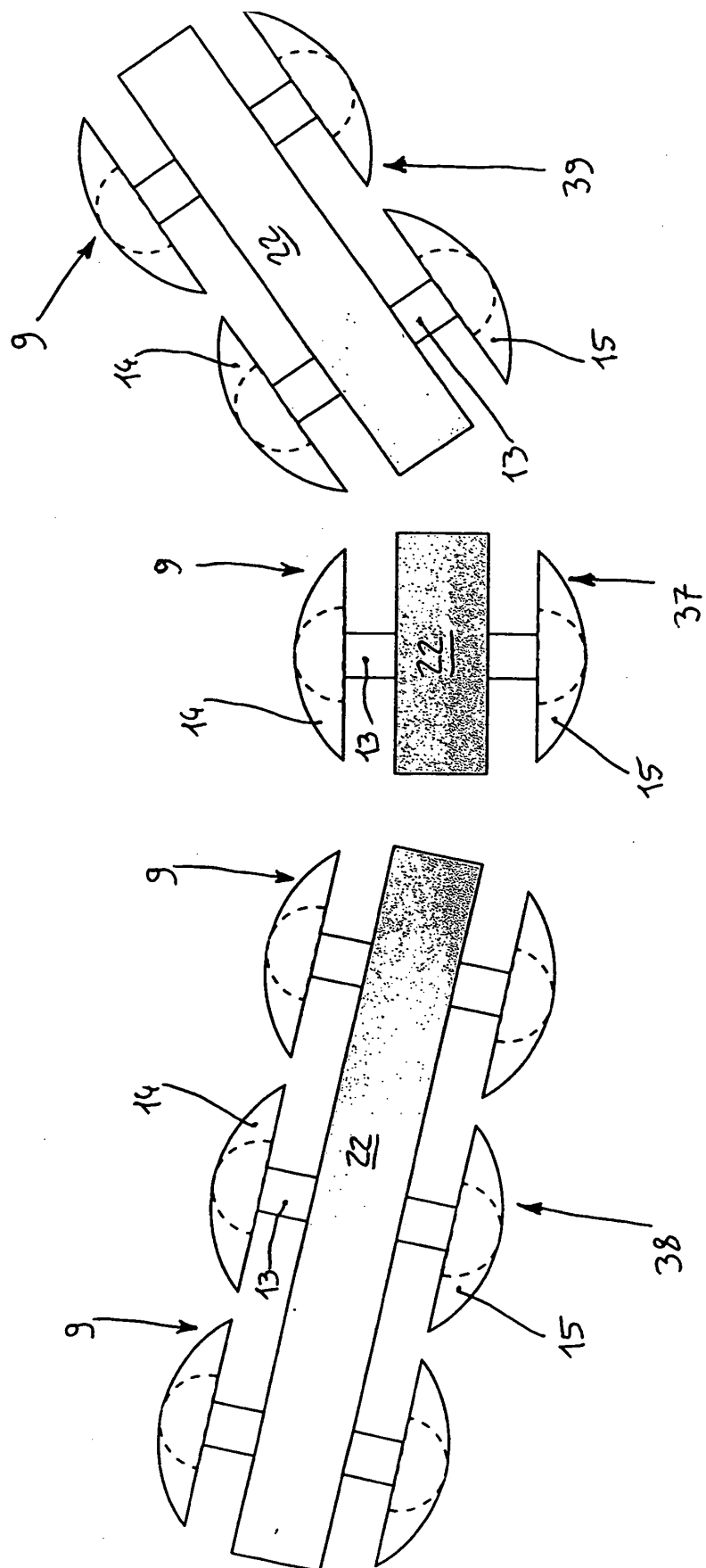


FIG. 9

FIG. 10



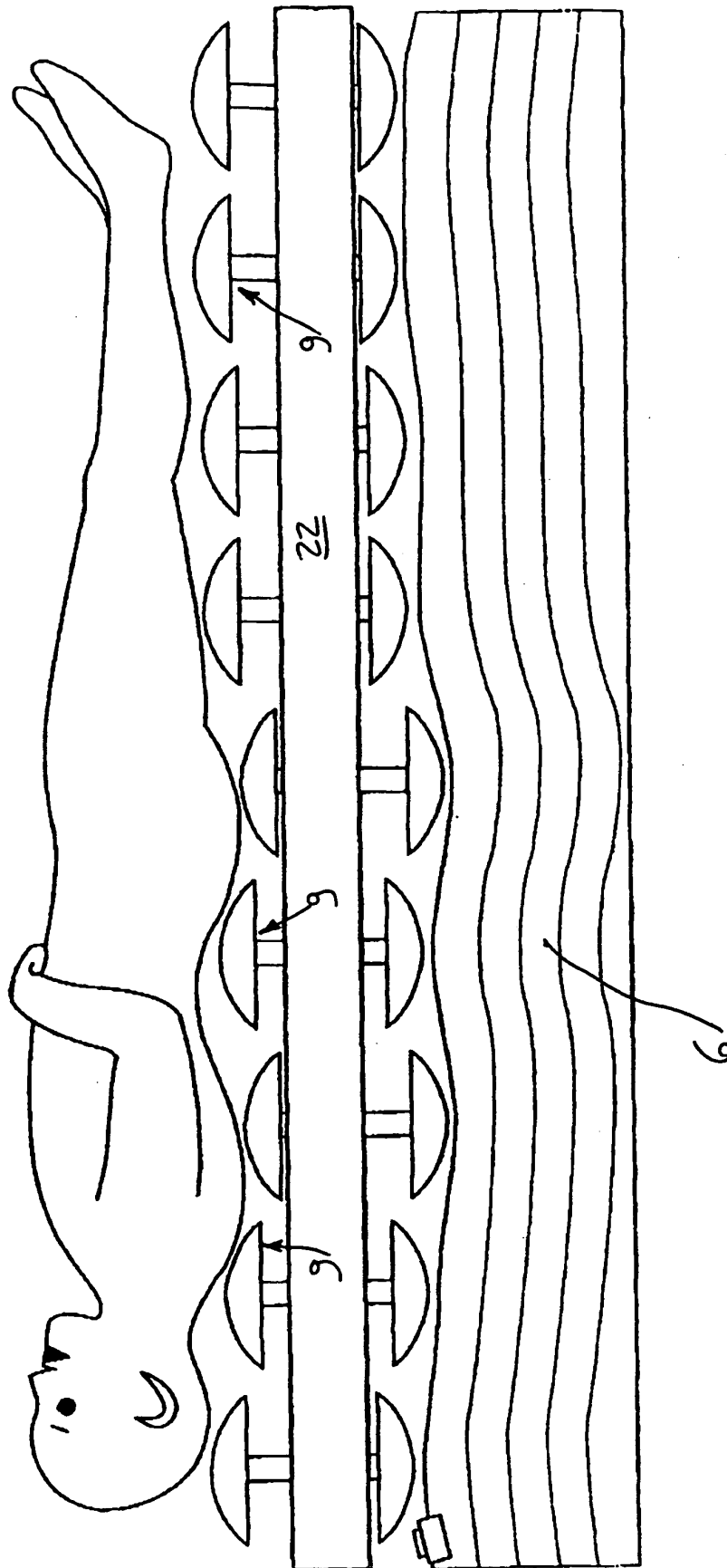


FIG. 11

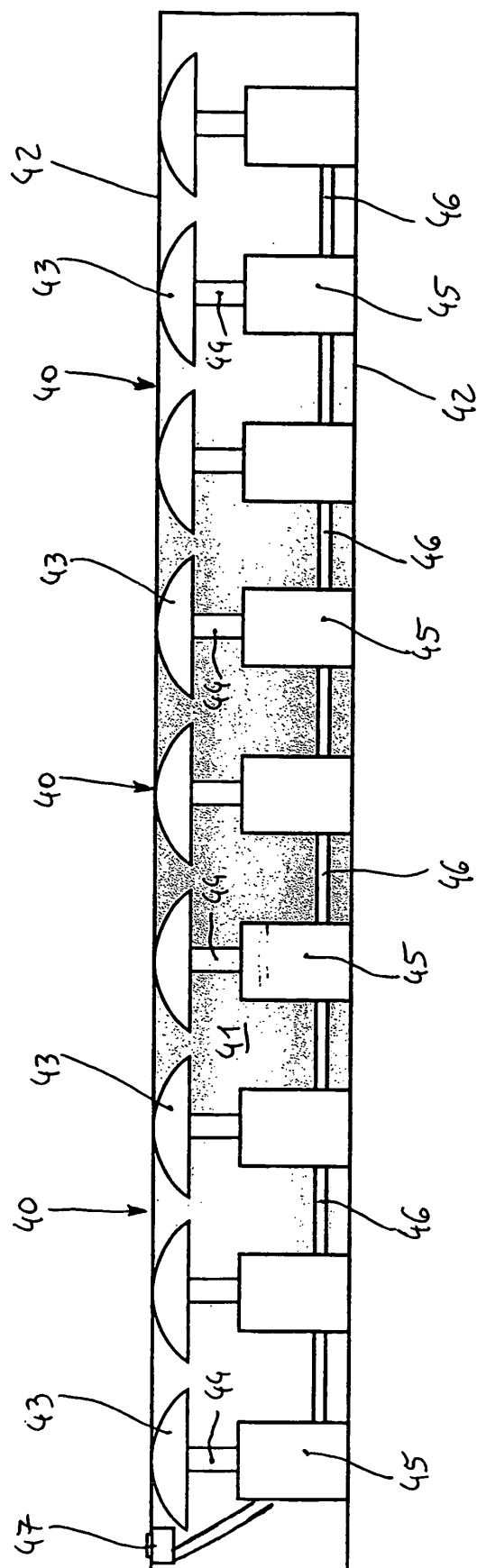
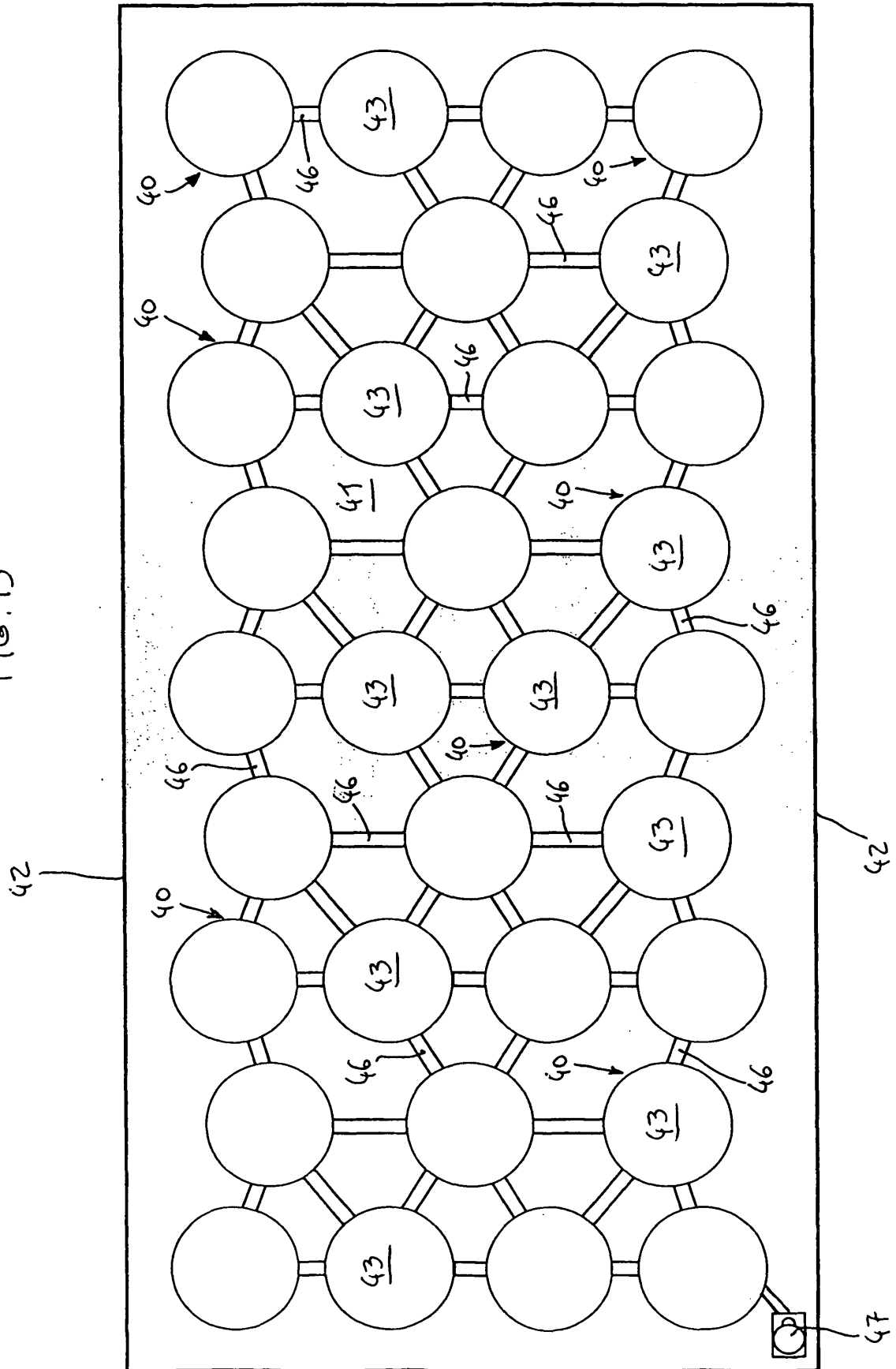


FIG. 12

FIG. 13



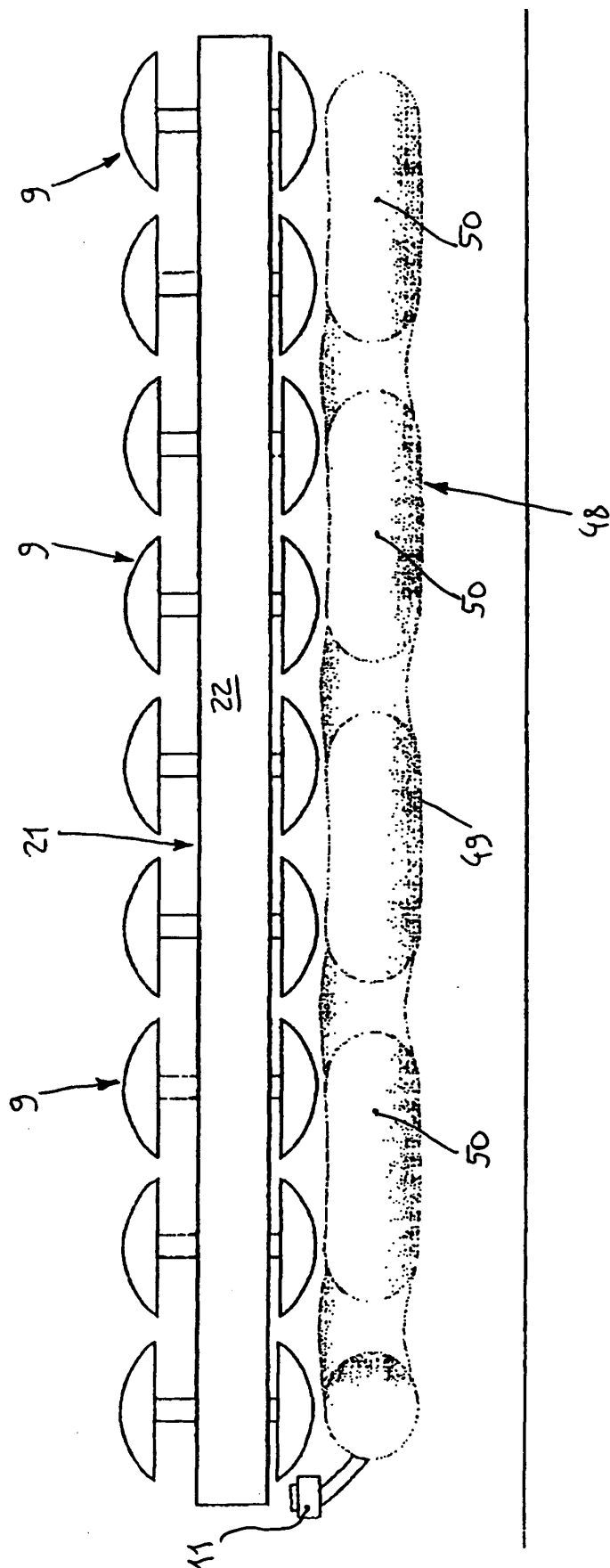


FIG. 14

FIG. 15

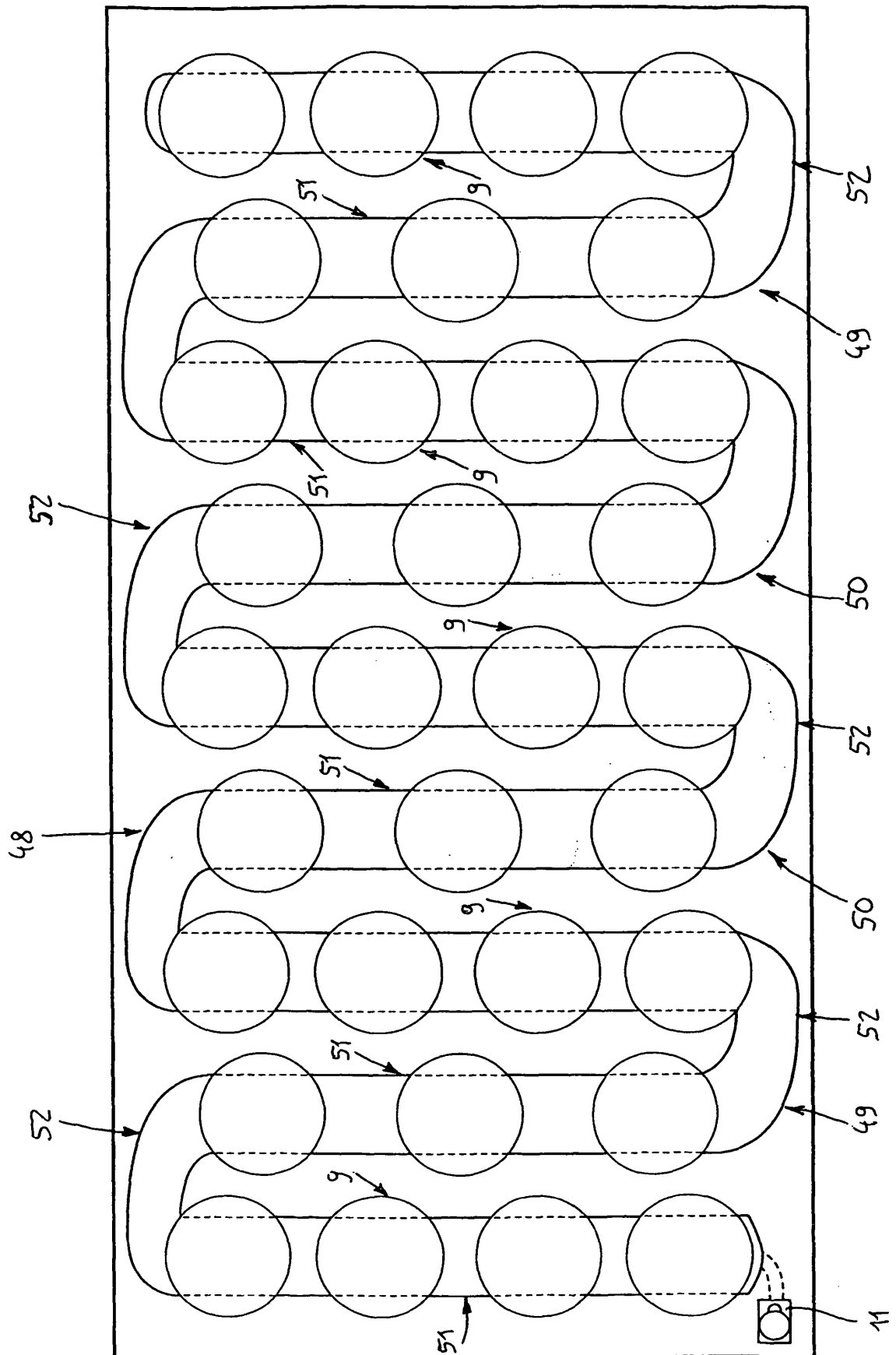
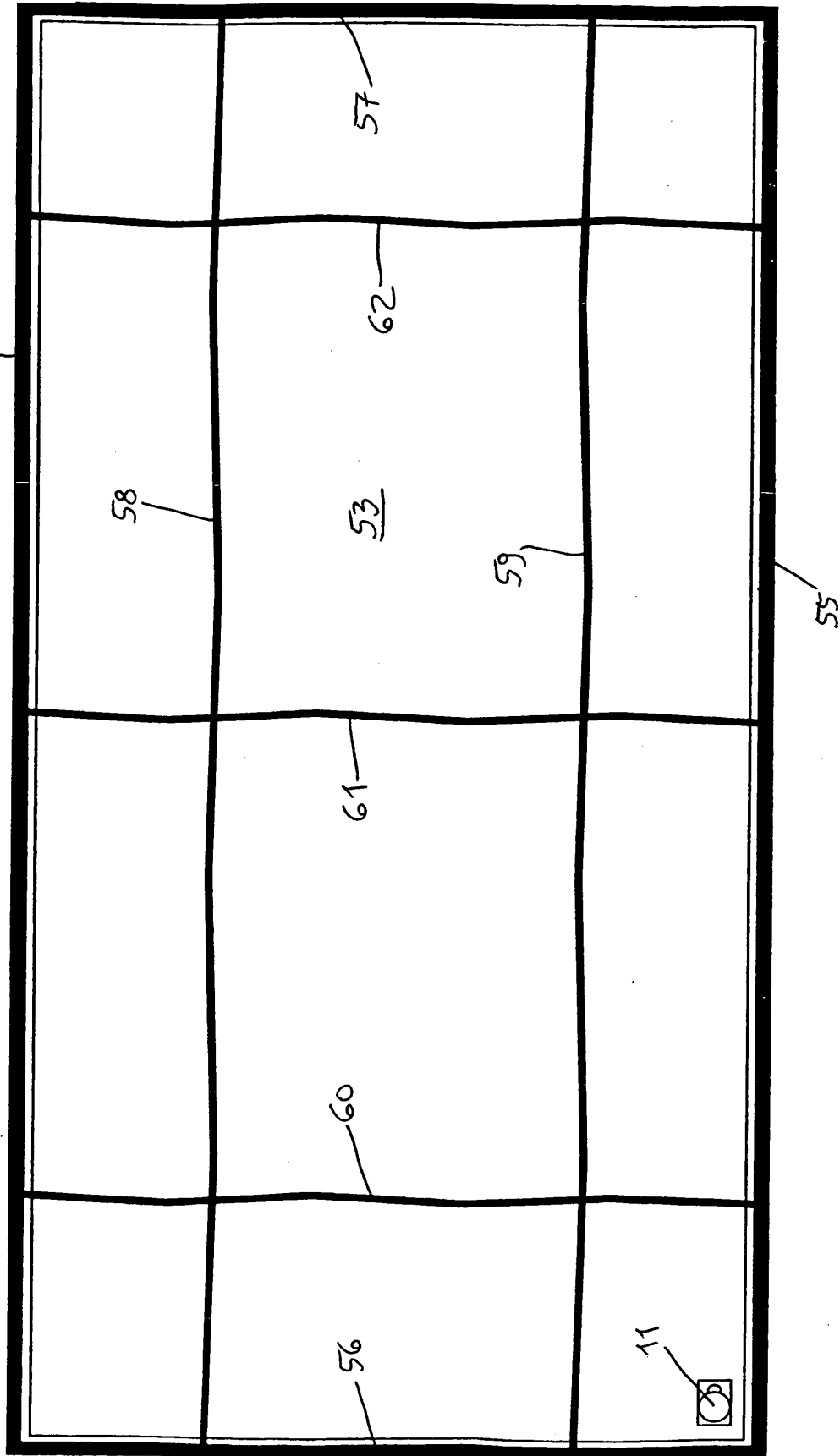
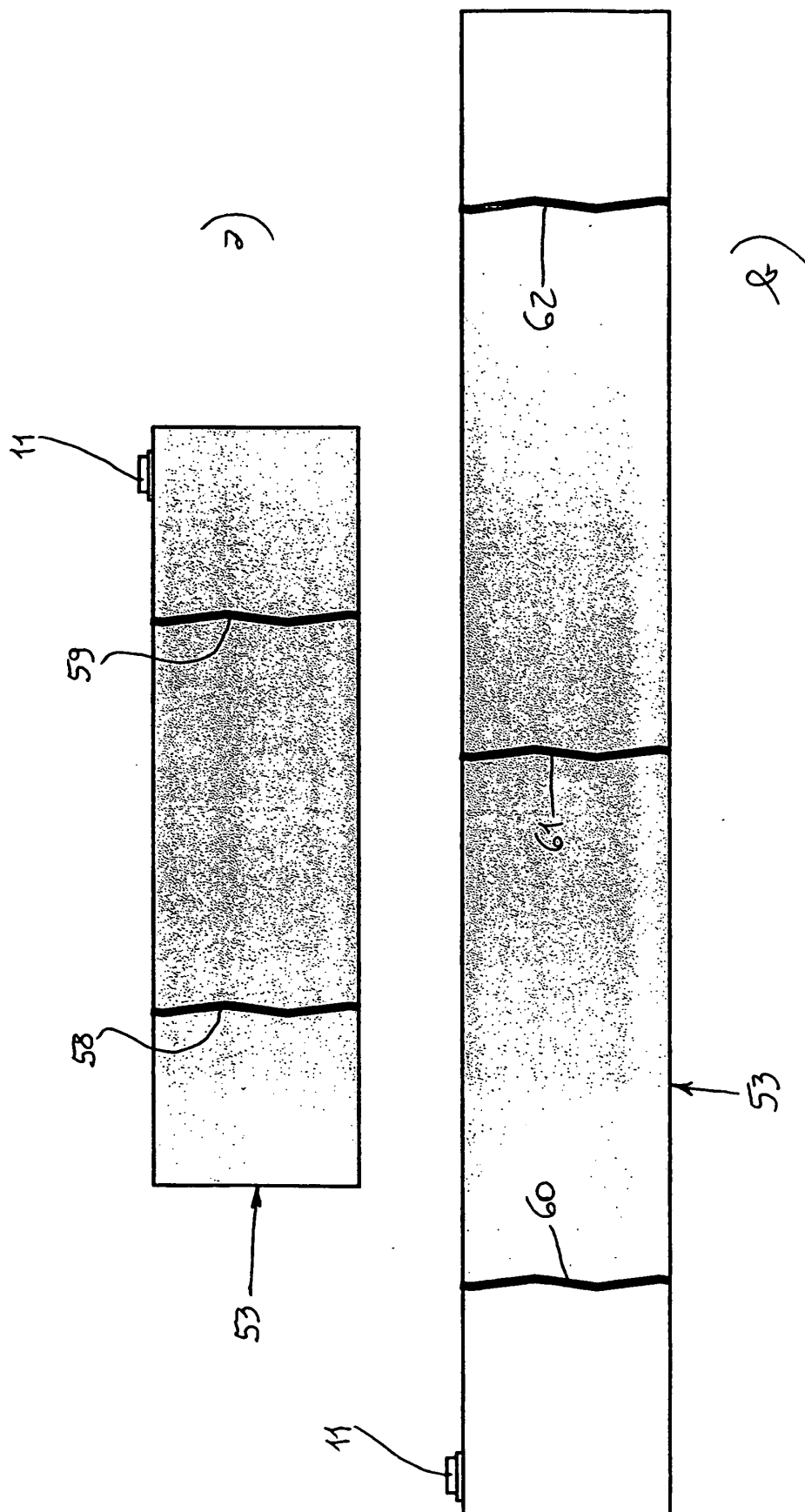


FIG. 16





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