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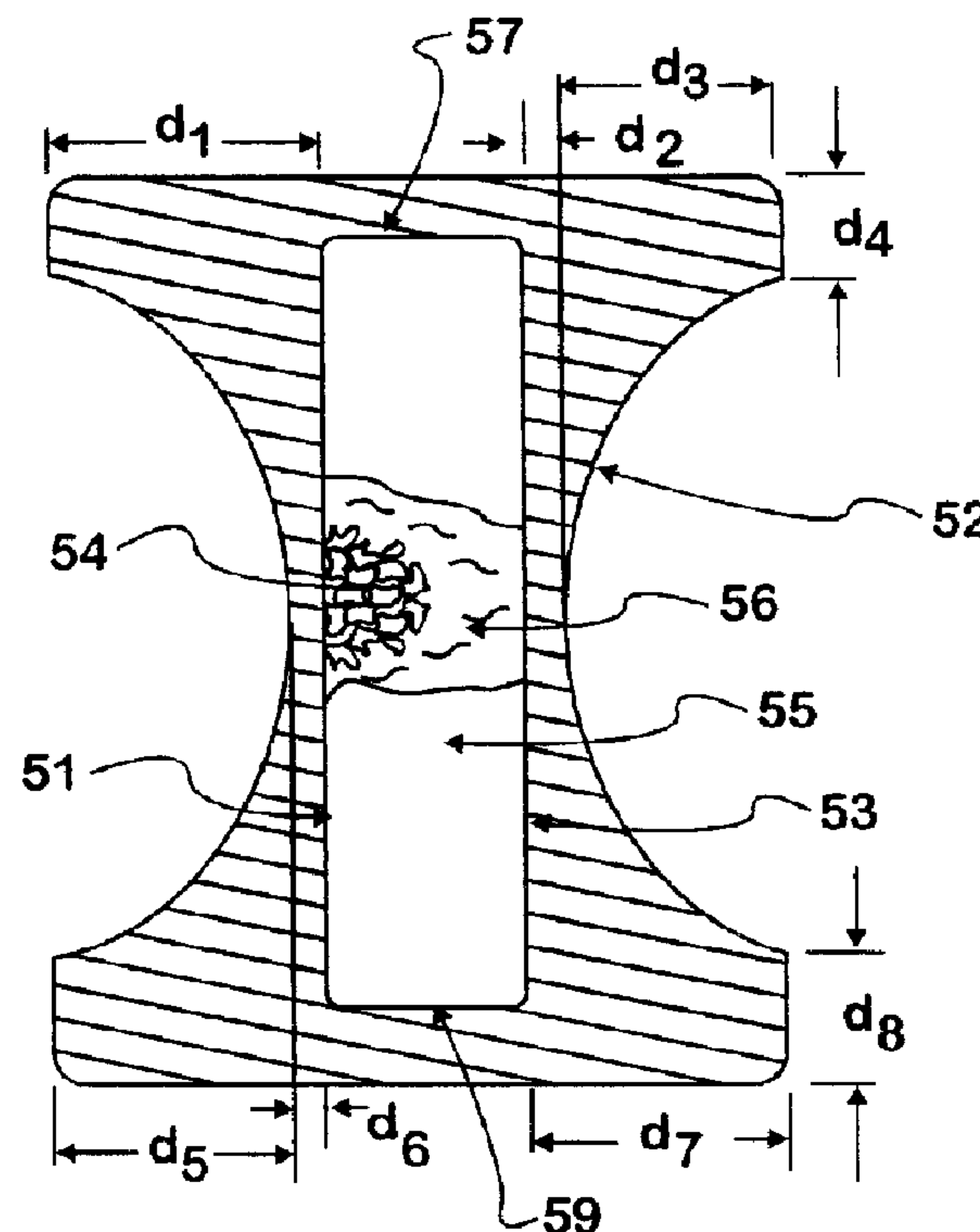
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(72) Inventeur/Inventor:
KOHOUT, DANIEL J., US

(73) Propriétaire/Owner:
ALLEGIANCE CORPORATION, US

(74) Agent: SIM & MCBURNEY

(54) Titre : VESSIE A GLACE ABSORBANTE
(54) Title: ABSORBENT ICE BAG



(57) **Abrégé/Abstract:**

An absorbent ice bag (10) made in accordance with the principles of the present invention includes an absorbent pad (12) operatively associated with an ice bag (15). The junction of the absorbent pad (12) and the ice bag (15) defines an unobstructed perimeter area that is an area of the absorbent pad (12) that extends beyond the ice bag (15). The unobstructed perimeter area provides an area of improved absorption and allows the side-by-side simultaneous placement of the ice bag (15) and the absorbent pad (12) on wound site. The ice bag (15) may contain ice (14), or other suitable phase change material. The ice bag (15) may also contain water (16), or other liquid that results from melting of the phase change.

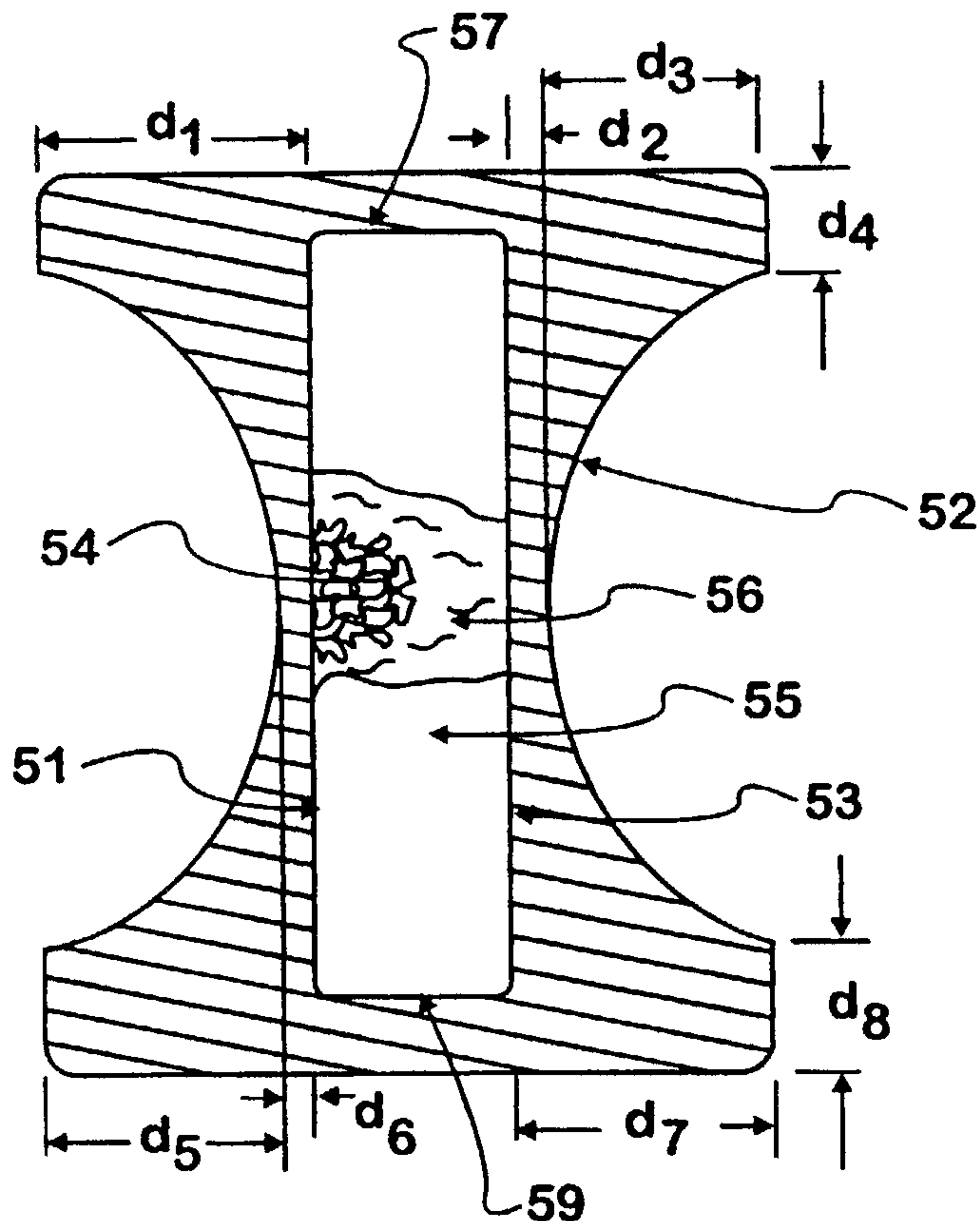
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(21) International Application Number: PCT/US00/11352 (22) International Filing Date: 26 April 2000 (26.04.00) (30) Priority Data: 09/302,730 30 April 1999 (30.04.99) US (71) Applicant: ALLEGIANCE CORPORATION [US/US]; Karl Bays Building, 1430 Waukegan Road, McGaw Park, IL 60085-6787 (US). (72) Inventor: KOHOUT, Daniel, J.; 438 West Trail Court, Grayslake, IL 60030 (US). (74) Agent: SCHAAFSMA, Paul, E.; Allegiance Corporation, 1430 Waukegan Road, McGaw Park, IL 60085-6787 (US).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report.

(54) Title: ABSORBENT ICE BAG**(57) Abstract**

An absorbent ice bag (10) made in accordance with the principles of the present invention includes an absorbent pad (12) operatively associated with an ice bag (15). The junction of the absorbent pad (12) and the ice bag (15) defines an unobstructed perimeter area that is an area of the absorbent pad (12) that extends beyond the ice bag (15). The unobstructed perimeter area provides an area of improved absorption and allows the side-by-side simultaneous placement of the ice bag (15) and the absorbent pad (12) on wound site. The ice bag (15) may contain ice (14), or other suitable phase change material. The ice bag (15) may also contain water (16), or other liquid that results from melting of the phase change.



ABSORBENT ICE BAG

Field of the Invention

This invention relates to a low cost ice bag that provides improved absorption of body fluids. This invention further relates to an absorbent ice bag product that is refillable and may be
5 regenerated *in situ*.

Background of the Invention

The use of cold packs for thermal therapy is known. Cold packs may be of several general types. One type of cold pack contains an insulating material which, upon cooling in a refrigerator or freezer, gradually warm back to ambient temperature. Another type of cold pack
10 operates via a change of phase of the components of the cold pack. Still another type of cold pack employs chemical components that are endotherm-producing on dissolution in a solvent.

Phase change materials may be converted between solid and liquid phases and utilize a latent heat of fusion to absorb, store and release heat, or cool, during such phase conversion. Accordingly, the amount of energy absorbed upon melting or released upon freezing is greater
15 than the amount of energy absorbed or released upon increasing or decreasing the temperature of the material. Ice/water is one example of a phase change material.

Certain chemical compounds, once dissolved into a solution, result in a lowering of the temperature of the solution below ambient temperature. On dissolution, these compounds absorb heat from the surrounding environment. For example, inorganic salts or soluble organic
20 compounds known to have a positive enthalpy of aqueous solution are used to make the reduced temperature solutions useful in cold packs.

Examples of cold packs that employ an insulating material are cold packs that contain a gel. Typically, these cold packs are cooled in a refrigerator or freezer. For cold therapy, once cooled, the cold pack is placed on the injured or sore area and thus provides the cold therapy.

Chemical cold packs that provide an insulating layer between the cold pack and the skin are also known. One such cold pack uses an outer pouch containing capillaries to allow drainage of the pack and to provide a temperature moderating effect. Another chemical cold pack uses a wetting member in contact with the chemical cold pack, thereby providing moist cold to an injury. Yet another chemical cold pack positions an absorbent/insulating layer between the chemical cold and the ambient air with the chemical cold pack placed up against the patient's skin. In this device, the surface area of the absorbent/insulating layer is smaller than the surface area of the cold pack. One prior art chemical cold pack cover provides means to attach the cold pack to a patient and to provide a water-resistant material in contact with the skin.

One disadvantage of the prior art devices is that the cold packs may not easily be regenerated *in situ*. Additionally, the prior art devices are not readily reusable for a single application. Another disadvantage of the prior art devices is that the insulating materials, while possessing at least some absorbency, are positioned away from the injury. A further disadvantage of the prior art devices is that the absorbency of the absorbent/insulating layer is obstructed by the larger cold pack surface area. Yet another disadvantage of the prior art devices is that they are costly to manufacture.

It would therefore be an advantage to have a cold pack that can be easily regenerated *in situ*. It would be a further advantage to have a cold pack that would allow the simultaneous placement of cold pack and absorbent pad on the injury site. It would be yet a further advantage to provide a low cost cold pack that can be regenerated *in situ* and allows the simultaneous placement of the cold pack and the absorbent pad on the injury site.

Summary of the Invention

The present invention provides a cold pack that can be regenerated *in situ*. The present invention provides a cold pack that allows the simultaneous placement of the cold pack and an absorbent pad on the injury site. The present invention further provides a low cost cold pack that

5 can be regenerated in situ and allows the simultaneous placement of the cold pack and the absorbent pad on the injury site.

The present invention provides an absorbent ice bag that includes an ice bag and an absorbent pad attached to the ice bag. One side of the ice bag defines a single-side surface area, while one side of the absorbent pad defines a pad area. The ice bag has a resealable opening.

10 The pad area is larger than the single side-surface area, and the difference in the areas provides an unobstructed perimeter. Phase change material may be added to the ice bag through the resealable opening and the unobstructed perimeter area provides an unobstructed area for absorbing a bodily fluid on the absorbent pad.

In accordance with an aspect of the present invention, there is provided an absorbent ice

15 bag comprising:

an ice bag defining a single-side surface area, the ice bag further defining a resealable opening;

an absorbent pad attached to the ice bag, the absorbent pad defining a pad area such that the pad area is larger than the single side-surface area, the pad area defining an area difference

20 that is the difference in area between the pad area and the single-side surface area; and

an unobstructed perimeter area formed from the area difference;

wherein a phase change material may be added to the ice bag through the resealable opening and wherein the unobstructed perimeter area provides an unobstructed area for absorbing a bodily fluid on the absorbent pad.

In accordance with another aspect of the present invention, there is provided an absorbent ice bag comprising:

an ice bag defining a single-side surface area, the ice bag further defining a resealable opening;

5 an absorbent pad attached to the ice bag, the absorbent pad defining a pad area such that the pad area is larger than the single side-surface area, the pad area further defining an area difference that is the difference in area between the pad area and the single-side surface area;

an unobstructed perimeter area formed from the area difference;

a first releasable fastener attached to the ice bag; and

10 a second releasable fastener attached to the absorbent pad;

wherein a phase change material may added to the ice bag through the resealable opening, wherein the unobstructed perimeter area provides an unobstructed area for absorbing a bodily fluid on the absorbent pad, and further wherein the first releasable fastener and the second releasable fastener releasably attach the absorbent pad to the ice bag.

15 In accordance with a further aspect of the present invention, there is provided an absorbent ice bag for cold therapy, the absorbent ice bag comprising:

an ice bag defining a single-side surface area, the ice bag further defining a resealable opening;

20 an absorbent pad attached to the ice bag, the absorbent pad defining a pad area such that the pad area is larger than the single side-surface area, the pad area further defining an area difference that is the difference in area between the pad area and the single-side surface area;

an unobstructed perimeter area formed from the area difference; and

at least a first containment pad and a second containment pad attached to the absorbent ice bag;

wherein a phase change material may added to the ice bag through the resealable opening, wherein the unobstructed perimeter area provides an unobstructed area for absorbing a bodily fluid on the absorbent pad, and wherein the containment pads focus the cold therapy.

Description of the Drawings

5 Figure 1 is a cross-sectional schematic of an absorbent ice bag made in accordance with the principles of the present invention.

Figure 2 is a plan view of the absorbent ice bag of Figure 1.

Figure 3 is a plan view of a component of an alternative embodiment of an absorbent ice bag of the present invention.

10 Figure 4 is a plan view of a component of an alternative embodiment of an absorbent ice bag of the present invention.

Figure 5 is a plan view of an alternative embodiment of an absorbent ice bag of the present invention.

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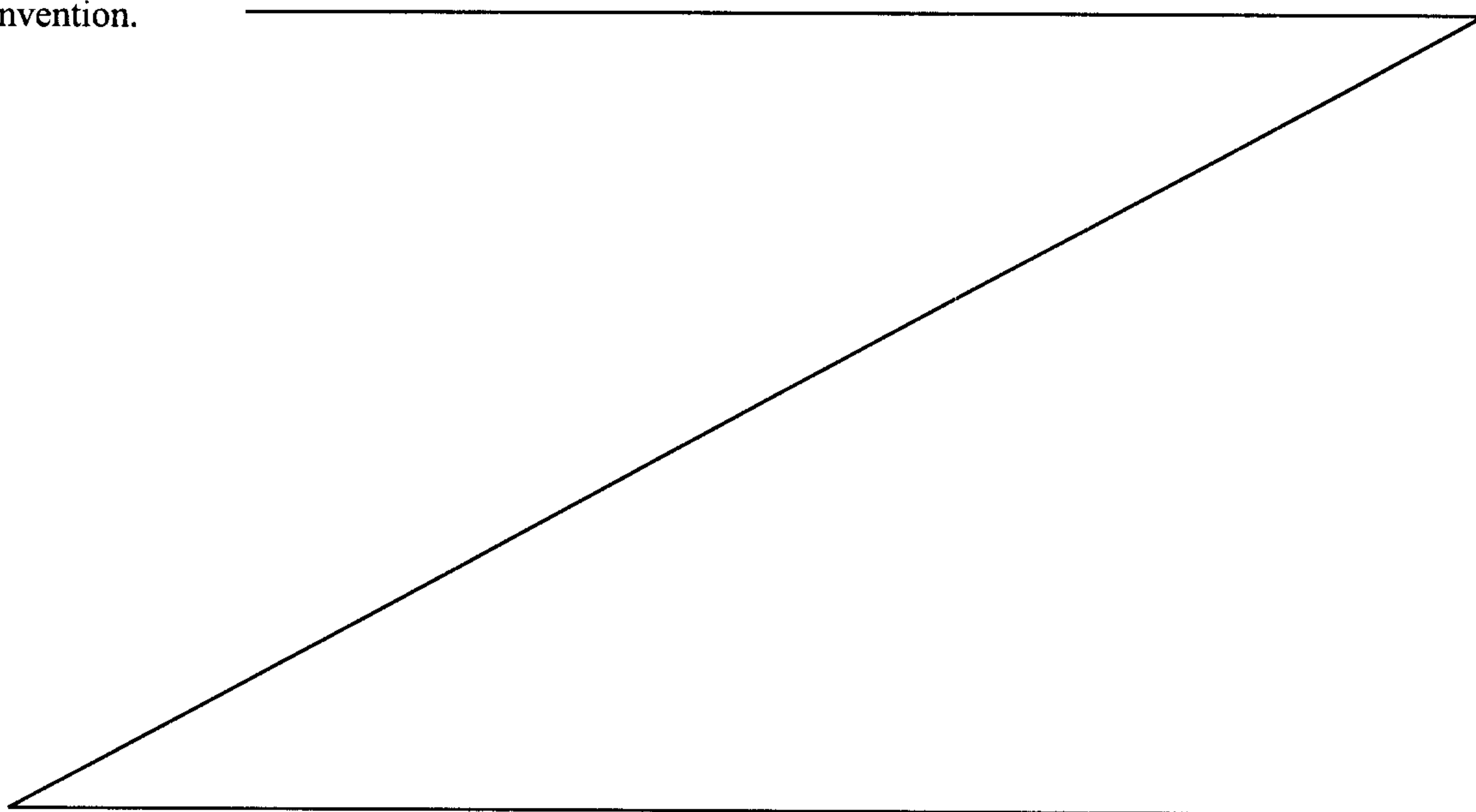


Figure 6 is a cross-sectional schematic of an alternative embodiment of an absorbent ice bag of the present invention.

Figure 6a is a cross-sectional view of an alternative embodiment of the absorbent ice bag of figure 6.

5 Figure 7 is a plan view of the absorbent ice bag of figure 6.

Figure 8 is an alternative embodiment of the absorbent ice bag of figure 7.

Figure 8a is a cross-sectional side view of the absorbent ice bag of figure 8.

Figure 9 is a cross-sectional schematic of an alternative embodiment of an absorbent ice bag of the present invention.

10 Figure 9a is a cross-sectional view of an alternative embodiment of the absorbent ice bag of figure 9.

Figure 10 is a plan view of the absorbent ice bag of figure 9.

Figure 11 is an alternative embodiment of the absorbent ice bag of figure 10.

Figure 12 is an alternative embodiment of the absorbent ice bag of figure 10.

15 Figure 13 is an alternative embodiment of the absorbent ice bag of figure 10.

Detailed Description of the Invention

Referring to figure 1, an absorbent ice bag made in accordance with the principles of the present invention is designated by 10. The absorbent ice bag 10 includes an absorbent pad 12 operatively associated with an ice bag 15. The ice bag 15 defines a single-side surface area that is the surface area of one side of the ice bag 15. The absorbent pad 12 defines a pad area that is the surface area of one side of the absorbent pad 12. The junction of the absorbent pad 12 and the ice bag 15 defines attachment sections 17, 19. The absorbent pad 12 extends beyond the ice bag 15 a perimeter distance d_1 at attachment section 17 and a perimeter distance d_2 at attachment

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section 19. The perimeter distances d_1 and d_2 will be more fully described below. The absorbent pad 12 defines a thickness t . The thickness t may range from about 0.125 inch to about 1 inch (about 0.3175 cm to about 2.5400 cm), and more, and preferably from about 0.250 inch to about 0.750 inch (about 0.6350 cm to about 1.9050 cm).

5 The ice bag 15 may contain ice 14, or other suitable phase change material. The ice bag 15 may also contain water 16, or other liquid that results from melting of the phase change material.

Referring now to figure 2, the absorbent ice bag 10 of figure 1 is depicted in plan view. As illustrated, the junction of the absorbent pad 12 and the ice bag 15 also defines attachment
10 sections 22, 24. As shown, the absorbent pad 12 extends beyond the ice bag 15 thus defining an unobstructed perimeter area. The unobstructed perimeter area is the area difference between the single-side surface area and the pad area. The unobstructed perimeter area further defines a perimeter distance d_1 at attachment section 17, a perimeter distance d_2 at attachment section 19, a perimeter distance d_3 at attachment section 22, and a perimeter distance d_4 at attachment section
15 24. The unobstructed perimeter area provides an area of the absorbent pad 12 that is unobstructed by the ice bag 15. Unlike the prior art devices, such an unobstructed area allows for simultaneous, side-by-side, placement of the ice bag 15 and the absorbent pad 12 on a wound site. Perimeter distances d_1 , d_2 , d_3 , and d_4 may range from about 0.125 inch to about 5 inches (about 0.3175 cm to about 12.7000 cm), or more. The magnitude of the perimeter distances d_1 ,
20 d_2 , d_3 , and d_4 may be different for different applications.

By providing an unobstructed perimeter area for absorption, the absorbent pad 12 may achieve a maximum absorbing efficiency in the unobstructed area. This is contrasted with the prior art devices where an absorbent material is about the same size as an associated cold pack,

or even smaller than the associated cold pack, and where such an absorbent material may be even further physically constrained by a semi-permeable plastic cover. Such obstructions and constraints physically limit the extent of absorption the absorbent material undergoes and thus the absorption efficiency is reduced.

5 The ice bag 15 may be attached to the absorbent pad 12 by various means. The ice bag 15 may be attached to the absorbent pad 12 using an adhesive. Alternatively, the ice bag 15 may be sewn to the absorbent pad 12, thus attaching the ice bag 15 to the absorbent pad 12.

 In one embodiment, the ice bag 15 is releasably attached to the absorbent pad 12 using releasable fasteners. A preferred means for such a releasable attachment is illustrated in figures
10 3 and 4. Figure 3 illustrates an absorbent pad 32 that further defines hook and loop fasteners 37, 39. Figure 4 illustrates ice bag 45 that further defines hook and loop fasteners 47, 49. The ice bag 45 may contain ice 44, or other suitable phase change material, and may also contain water 46, or other liquid that results from melting of the phase change material. Hook and loop fastener 37 may be operatively associated with hook and loop fastener 47 and hook and loop
15 fastener 39 may be operatively associated with hook and loop fastener 49, so that the absorbent pad 32 is attached to the ice bag 45.

 Referring back to figure 1, the ice bag 15 may be made from any waterproof material. Waterproof materials may include, for example, extruded, cast, or blown films of polyethylene, polyester, polypropylene, cellulose esters, cellulose ethers, nylon, polyvinyl alcohol acetals,
20 polyvinyl chloride, polyvinyl chloride acetate, polystyral, methyl methacrylate, polyvinylidene chloride, and ethylene octene copolymers, and copolymers of these materials, and laminates of any of these materials. The films may be metallized. The waterproof materials may also include woven fabrics that are made from a hydrophobic material such as nylon, polyethylene and

polypropylene, and combinations of these polymers. The ice bag 15 may also be made from a multiple ply material. One example of a multiple ply material is a two-ply material that includes a waterproof layer and a liquid repellent layer. The waterproof layer would form the interior of the ice bag 15 and contain the phase change material. The liquid repellent layer would form the exterior of the ice bag 15. The liquid repellent materials may include woven fabrics that are made from a hydrophobic material such as nylon, polyethylene, polypropylene or polyvinylidene chloride, and combinations of these materials.

The ice bag 15 is resealable and, thus, has a resealable opening. A resealable ice bag 15 allows for filling and refilling the ice bag 15 with an appropriate phase change material such as ice 14. Thus the present invention provides an absorbent ice bag 15 that may be regenerated *in situ*. Additionally, the present invention provides an absorbent ice bag 10 that may be reused for a given application. For example, a phase change material may be added to the ice bag 15 while the ice bag 15 is on a wound site. Also, for those uses where it is not practical to add a phase change material to the ice bag 15 *in situ*, the absorbent ice bag 10 may be removed from the wound site, refilled with a phase change material, and replaced on the wound site. Any of a variety of resealable closure devices may be included with the absorbent ice bag to provide a resealable feature to the ice bag 15. The resealable closure devices may include mechanical clips, jack-knife-type safety clips, clamps, tie strings, tie straps, zippers, adhesive seals, ZIPLOC (a registered trademark of Dow Chemical Company, Midland, Michigan), and VON-LOC (a registered trademark of Vonco Products, Inc., Lake Villa, Illinois.)

In one embodiment, the ice bag 15 is releasably attached to the absorbent pad 12 and the ice bag 15 is resealable, both configurations having been described above. This embodiment provides an absorbent ice bag 10 that may be practically refilled away from a wound site while

the absorbent pad remains in contact with the wound site. This embodiment also provides an absorbent ice bag 10 that allows for easy replacement of the absorbent pad 12.

The absorbent pad 12 may be made from conventional cellulosic materials, such as cellulose or cellulose derivatives. Optionally, the absorbent pad 12 may be made from a combination of cellulosic material and a super absorbent polymer. Examples of the super absorbent polymer include poly-N-vinylacetamide and cross-linked sodium polyacrylate. Other materials, such as cotton, polypropylene, and polyester, may also be used for the absorbent pad 12. The materials from which the absorbent pad 12 can be made may also generally include non-woven fabrics. The absorbent pad 12 may even be made from a sponge.

Referring now to figure 5, a schematic of an alternative embodiment of the absorbent ice bag 10 is presented. The junction of the absorbent pad 52 and the ice bag 55 defines attachment sections 57, 59, 53 and 51. The absorbent pad 52 extends beyond the ice bag 55 thus providing an unobstructed perimeter area. The unobstructed perimeter area defines perimeter distances d_1 , d_3 and d_4 at attachment section 57, a perimeter distance d_2 at attachment section 53, a perimeter distance d_6 at attachment section 51, and perimeter distances d_5 , d_7 and d_8 at attachment section 59. The unobstructed perimeter area provides an area of the absorbent pad 52 that is unobstructed by the ice bag 55. The unobstructed perimeter area allows for simultaneous, side-by-side, placement of the ice bag 55 and the absorbent pad 52 on a wound site. Perimeter distances d_1 through d_8 may range from about 0.125 inch to about 5 inches (about 0.3175 cm to about 12.7000 cm), or more. The magnitude of the perimeter distances d_1 through d_8 may be different for different applications. The ice bag 55 may be attached to the absorbent pad 52 by various means as described above. In the preferred embodiment, the ice bag 55 is releasably attached to the absorbent pad 52.

The shape of the absorbent pad 52 may be described as an hour glass and is configured to accommodate the perineum. Thus it can be seen that the areas unobstructed by the ice bag 52, and described by the perimeter distances d_1 through d_8 , provide an improvement over the prior art for both the absorption of bodily fluids from the perineum and providing cold therapy to the perineum. Where the ice bag 55 is attached to the absorbent pad 52 there is a reduced absorbency, as described above.

Figure 6 presents yet another embodiment of the absorbent ice bag 10 of the present invention. The absorbent ice bag 10 includes an absorbent pad 62 operatively associated with an ice bag 65. The absorbent pad 62 defines a thickness t_3 . The thickness t_3 may range from about 0.125 inch to about 1 inch (about 0.3175 cm to about 2.5400 cm), and preferably from about 0.250 inch to about 0.750 inch (about 0.6350 cm to about 1.9050 cm).

The absorbent ice bag 10 may further include containment pads 61, 63. The containment pads 61, 63 are attached to a side of the absorbent pad 62 that is operatively associated with the ice bag 65. The containment pads 61, 63 are positioned so as to focus the cold therapy to a region of the body in need of therapy. Thus, the containment pads also provide a thermal barrier that reduces absorption of heat through the ends of the ice bag 65 from the ambient air. The containment pad 61 further defines a thickness t_1 and the containment pad 63 further defines a thickness t_2 . The thickness t_1 , t_2 may range from about 0.125 inch to about 1 inch (about 0.3175 cm to about 2.5400 cm), and more, and preferably from about 0.250 inch to about 0.750 inch (about 0.6350 cm to about 1.9050 cm). The thickness t_1 may be equal to or different from the thickness t_2 . The containment pads 61, 63 may be made from a material that provides a thermal barrier such as a cellulosic material, felt, wool, or other suitable material.

The ice bag 65 may contain ice 64, or other suitable phase change material. The ice bag 65 may also contain water 66, or other liquid that results from melting of the phase change material.

Referring now to figure 7, the ice bag 65 of figure 6 is depicted in plan view. As illustrated, the junction of the absorbent pad 62 and the ice bag 65 defines attachment sections 67, 69, 72 and 74. The absorbent pad 62 extends beyond the ice bag 65 thus providing an unobstructed perimeter area. The unobstructed perimeter area defines a perimeter distance d_1 at attachment section 67, a perimeter distance d_2 at attachment section 69, a perimeter distance d_3 at attachment section 74, and a perimeter distance d_4 at attachment section 72. The unobstructed perimeter area provides an area of the absorbent pad 62 that is unobstructed by the ice bag 65. Such an unobstructed area allows for simultaneous, side-by-side, placement of the ice bag 65 and the absorbent pad 62 on a wound site. Perimeter distances d_1 , d_2 , d_3 , and d_4 may range from about 0.125 inch to about 5 inches (about 0.3175 cm to about 12.7000 cm), or more. The magnitude of the perimeter distances d_1 , d_2 , d_3 , and d_4 may be different for different applications.

Referring to figure 6a, an alternative embodiment of the absorbent ice bag 10 of figure 6 is illustrated. The components of the embodiment illustrated in figure 6a are the same as those identified in figure 6. The thickness and the perimeter distances defined by the embodiment illustrated in figure 6a are also the same as those identified in figure 6. Thus, the absorbent ice bag 10 includes an absorbent pad 62 operatively associated with an ice bag 65 and containment pads 61, 63. As described above, the containment pads 61, 63 are positioned so as to focus the cold therapy to a region of the body in need of therapy. In the embodiment illustrated in figure 6a, the containment pads 61, 63 are attached to a side of the absorbent pad 62 that is opposite the side of the absorbent pad operatively associated with the ice bag 65.

As described above, the ice bag 65 may contain ice 64, or other suitable phase change material. The ice bag 65 may also contain water 66, or other liquid that results from melting of the phase change material.

Figures 8 and 8a illustrate yet another embodiment of the absorbent ice bag 10 of the present invention. The absorbent ice bag 10 includes an absorbent pad 82 operatively associated with an ice bag 85. The absorbent pad 82 defines a thickness t_3 . The thickness t_3 may range from about 0.125 inch to about 1 inch (about 0.3175 cm to about 2.5400 cm), and more, and preferably from about 0.250 inch to about 0.750 inch (about 0.6350 cm to about 1.9050 cm).

The absorbent ice bag 10 further includes containment pads 81, 83. The containment pads 81, 83 are attached to a side of the absorbent pad 82 that is operatively associated with the ice bag 85. The containment pads 81, 83 are positioned so as to focus the cold therapy to a region of the body in need of therapy. Thus, the containment pads also provide a thermal barrier that reduces absorption of heat through the ends of the ice bag 85 from the ambient air. The containment pad 81 further defines a thickness t_1 and the containment pad 83 further defines a thickness t_2 . The thickness t_1, t_2 may range from about 0.125 inch to about 1 inch (about 0.3175 cm to about 2.5400 cm), and more, and preferably from about 0.250 inch to about 0.750 inch (about 0.6350 cm to about 1.9050 cm). The thickness t_1 may be equal to or different from the thickness t_2 .

As provided with the other embodiments the present invention, the ice bag 85 may contain ice 84, or other suitable phase change material. The ice bag 85 may also contain water 86, or other liquid that results from melting of the phase change material.

Figures 9, 9a, and 10 illustrate embodiments of the absorbent ice bag 10 that include more than two containment pads. The absorbent ice bag 10 includes an absorbent pad 92

operatively associated with an ice bag 95. The absorbent pad 92 defines a thickness t_3 . The thickness t_3 may range from about 0.125 inch to about 1 inch (about 0.3175 cm to about 2.5400 cm), and more, and preferably from about 0.250 inch to about 0.750 inch (about 0.6350 cm to about 1.9050 cm).

5 The absorbent ice bag 10 further includes containment pads 91, 93, 98. The containment pads 91, 93, 98 may be attached to a side of the absorbent pad 92 that is operatively associated with the ice bag 95, as shown in figure 9. In an alternative embodiment, the containment pads 91, 93, 98 may be attached to a side of the absorbent pad 92 that is opposite the side of the absorbent pad 92 that is operatively associated with the ice bag 95, as shown in figure 9a. As
10 described above, the containment pads 91, 93, 98 are positioned so as to focus the cold therapy to a region of the body in need of therapy. The containment pad 91 further defines a thickness t_1 , the containment pad 93 further defines a thickness t_4 (not illustrated), and the containment pad 98 further defines a thickness t_2 . The thickness t_1 , t_2 , t_4 may range from about 0.125 inch to about 1 inch (about 0.3175 cm to about 2.5400 cm), and more, and preferably from about 0.250 inch to
15 about 0.750 inch (about 0.6350 cm to about 1.9050 cm). The thickness t_1 , t_2 , t_4 may be equal or different.

 The ice bag 95 may contain ice 94, or other suitable phase change material. The ice bag 95 may also contain water 96, or other liquid that results from melting of the phase change material.

20 Referring now to figure 10, the ice bag 65 of figure 9 is depicted in plan view. As illustrated, the junction of the absorbent pad 92 and the ice bag 95 defines attachment sections 97, 99, 102 and 104. The absorbent pad 92 extends beyond the ice bag 95 thus providing an unobstructed perimeter area. The unobstructed perimeter area defines a perimeter distance d_1 at

attachment section 97, a perimeter distance d_2 at attachment section 99, a perimeter distance d_3 at attachment section 104, and d_4 at attachment section 102. The unobstructed perimeter area provides an area of the absorbent pad 92 that is unobstructed by the ice bag 95. Such an unobstructed area allows for simultaneous, side-by-side, placement of the ice bag 95 and the absorbent pad 92 on a wound site. Perimeter distances d_1 , d_2 , d_3 , and d_4 may range from about 0.125 inch to about 5 inches (about 0.3175 cm to about 12.7000 cm), or more. The magnitude of the perimeter distances d_1 , d_2 , d_3 , and d_4 may be different for different applications.

Referring to figures 11, 12, and 13, alternative embodiments of the absorbent ice bag 10 that include containment pads are shown. In figure 11, the junction of the absorbent pad 112 and the ice bag 115 defines attachment sections 117, 119, 106 and 108. The absorbent pad 112 extends beyond the ice bag 115 at attachment section 117, 119, 106 and 108 thus forming areas unobstructed by the ice bag 115. As described above, such unobstructed areas allow for simultaneous, side-by-side, placement of the ice bag 115 and the absorbent pad 112 on a wound site. In one embodiment, the ice bag 115 is releasably attached to the absorbent pad 112.

The shape of the absorbent pad 112 may be described as an hour glass and is configured to accommodate the perineum. Thus it can be seen that the areas unobstructed by the ice bag 112 provide an improvement over the prior art for both the absorption of bodily fluids from the perineum and providing cold therapy to the perineum. Where the ice bag 115 is attached to the absorbent pad 112 there is a reduced absorbency, as described above.

The absorbent ice bag 10 further includes containment pads 111, 113. The containment pads 111, 113 may be attached to a side of the absorbent pad 112 that is operatively associated with the ice bag 115, as shown in figure 11. In an alternative embodiment (not shown), the containment pads 111, 113 may be attached to a side of the absorbent pad 112 that is opposite

the side of the absorbent pad 112 that is operatively associated with the ice bag 115. As described above, the containment pads 111, 113 are positioned so as to focus the cold therapy to a region of the body in need of therapy. The containment pads may be adapted to a semi-circular shape, as shown, to better accommodate, for example, the perineum. However, the containment
5 pads 111, 113 may be adapted to other shapes to accommodate other areas of a person's body.

Likewise, figure 12 illustrates an embodiment of the absorbent ice bag 10 that is shaped to accommodate an area of the human body. The junction of the absorbent pad 122 and the ice bag 125 defines attachment sections 127, 129, 126 and 128. The absorbent pad 122 extends beyond the ice bag 125 at attachment section 127, 129, 126 and 128 thus forming areas
10 unobstructed by the ice bag 125. As described above, such unobstructed areas allow for simultaneous, side-by-side, placement of the ice bag 125 and the absorbent pad 122 on a wound site. In one embodiment, the ice bag 125 is releasably attached to the absorbent pad 122.

The shape of the ice bag 125 may be described as an hour glass and is configured to accommodate, for example, the perineum. Thus it can be seen that the ice bag 125 and the areas
15 unobstructed by the ice bag 125 provide an improvement, for example, over the prior art for both the absorption of bodily fluids from the perineum and providing cold therapy to the perineum.

The absorbent ice bag 10 further includes containment pads 121, 123. The containment pads 121, 123 may be attached to a side of the absorbent pad 122 that is operatively associated with the ice bag 125, as shown in figure 12. In an alternative embodiment (not shown), the
20 containment pads 121, 123 may be attached to a side of the absorbent pad 122 that is opposite the side of the absorbent pad 122 that is operatively associated with the ice bag 125. As described above, the containment pads 121, 123 are positioned so as to focus the cold therapy to a region of the body in need of therapy.

Similarly, figure 13 illustrates yet another embodiment of the absorbent ice bag 10 that is shaped to accommodate an area of the human body. The junction of the absorbent pad 132 and the ice bag 135 defines attachment sections 137, 139, 142 and 144. The absorbent pad 132 extends beyond the ice bag 135 at attachment section 137, 139, 142 and 144 thus forming areas
5 unobstructed by the ice bag 135. As described above, such unobstructed areas allow for simultaneous, side-by-side, placement of the ice bag 135 and the absorbent pad 132 on a wound site. In the preferred embodiment, the ice bag 135 is releasably attached to the absorbent pad 132.

The shape of the ice bag 135 may be described as a double hour glass and is configured
10 to accommodate, for example, the perineum and the rectum. Thus it can be seen that the ice bag 135 and the areas unobstructed by the ice bag 135 provide an improvement, for example, over the prior art for both the absorption of bodily fluids from the perineum and the rectum and providing cold therapy to the perineum and the rectum.

The absorbent ice bag 10 further includes containment pads 131, 133. The containment
15 pads 131, 133 may be attached to a side of the absorbent pad 132 that is operatively associated with the ice bag 135, as shown in figure 12. In an alternative embodiment (not shown), the containment pads 131, 133 may be attached to a side of the absorbent pad 132 that is opposite the side of the absorbent pad 132 that is operatively associated with the ice bag 135. As described above, the containment pads 131, 133 are positioned so as to focus the cold therapy to
20 a region of the body in need of therapy.

As with each of the embodiments described above, ice bags 115, 125, 135 may contain ice, 118, 128, 138 or other suitable phase change material. Ice bags 115, 125, 135 may also

contain water, 116, 126, 136, or other liquid that results from melting of the phase change material.

The absorbent ice bag 10 of the present invention may be attached to the body of the person requiring thermal therapy. Any of the means for attachment known in the art may be
5 suitable for use with the absorbent ice bag 10 of the present invention. Accordingly, ties or straps may be used as attachment means. Hook and loop fasteners may be used to attach the absorbent ice bag 10 to a person's garment. Alternatively, the absorbent ice bag 10 may be held in place by a person's garment, such as an under garment. Other attachment means developed in the art may also provide suitable means to attach the absorbent ice bag to the body of a person
10 requiring thermal therapy.

There has been provided, in accordance with the present invention, a low cost absorbent ice bag that provides for both cold therapy and the absorption of bodily fluids from wound sites. The present invention provides a cold pack that can be regenerated *in situ*. The present invention provides a cold pack that allows the simultaneous placement of the cold pack and an absorbent
15 pad on the injury site. The present invention further provides a low cost cold pack that can be regenerated *in situ* and allows the simultaneous placement of the cold pack and the absorbent pad on the injury site.

While the invention has been described with specific embodiments, many alternatives, modifications and variations will be apparent to those skilled in the art in light of the foregoing
20 description. Accordingly, it is intended to include all such alternatives, modifications and variations set forth within the spirit and scope of the appended claims.

What Is Claimed Is:

1. An absorbent ice bag comprising:

an ice bag defining a single-side surface area, the ice bag further defining a resealable opening;

5 an absorbent pad attached to the ice bag, the absorbent pad defining a pad area such that the pad area is larger than the single side-surface area, the pad area defining an area difference that is the difference in area between the pad area and the single-side surface area; and

an unobstructed perimeter area formed from the area difference;

10 wherein a phase change material may be added to the ice bag through the resealable opening and wherein the unobstructed perimeter area provides an unobstructed area for absorbing a bodily fluid on the absorbent pad.

2. The absorbent ice bag of claim 1 wherein the unobstructed perimeter area defines at least four perimeter distances d_1 , d_2 , d_3 , and d_4 , the perimeter distances d_1 , d_2 , d_3 , and d_4 being from
15 about 0.125 inch to about 5 inches.

3. The absorbent ice bag of claim 1 wherein the perimeter distances d_1 , d_2 , d_3 , and d_4 are at least 0.125 inch.

20 4. The absorbent ice bag of claim 1 wherein the absorbent pad defines a thickness t , the thickness t being from about 0.125 inch to about 1 inch.

5. The absorbent ice bag of claim 4 wherein the thickness t is from about 0.250 inch to about 0.750 inch.
6. The absorbent ice bag of claim 1 wherein the absorbent pad is manufactured from a super
5 absorbent polymer.
7. The absorbent ice bag of claim 1 wherein the absorbent pad is manufactured from a material selected from the group consisting of cellulose, cellulose derivatives, cotton, polypropylene, polyester, poly-N-vinylacetamide, cross-linked sodium polyacrylate and
10 combinations thereof.
8. The absorbent ice bag of claim 1 wherein the ice bag is manufactured from a material selected from the group consisting of polyethylene, polyester, polypropylene, cellulose esters, cellulose ethers, nylon, polyvinyl alcohol acetals, polyvinyl chloride, polyvinyl chloride acetate,
15 polystyral, methyl methacrylate, polyvinylidene chloride, ethylene octene copolymers, and combinations thereof.
9. The absorbent ice bag of claim 8 wherein the material is metallized.
- 20 10. The absorbent ice bag of claim 1 wherein the phase change material is ice.
11. The absorbent ice bag of claim 1 wherein the absorbent pad is hour glass shaped.

12. The absorbent ice bag of claim 1 wherein the ice bag is hour glassed shaped.

13. The absorbent ice bag of claim 1 wherein the ice bag is double hour glass shaped.

5 14. An absorbent ice bag comprising:

an ice bag defining a single-side surface area, the ice bag further defining a resealable opening;

an absorbent pad attached to the ice bag, the absorbent pad defining a pad area such that the pad area is larger than the single side-surface area, the pad area further defining an area

10 difference that is the difference in area between the pad area and the single-side surface area;

an unobstructed perimeter area formed from the area difference;

a first releasable fastener attached to the ice bag; and

a second releasable fastener attached to the absorbent pad;

15 wherein a phase change material may added to the ice bag through the resealable opening, wherein the unobstructed perimeter area provides an unobstructed area for absorbing a bodily fluid on the absorbent pad, and further wherein the first releasable fastener and the second releasable fastener releasably attach the absorbent pad to the ice bag.

15. The absorbent ice bag of claim 14 wherein the first releasable fastener and the second
20 releasable fastener are hook and loop fasteners.

16. The absorbent ice bag of claim 14 wherein the unobstructed perimeter area defines at least four perimeter distances d_1 , d_2 , d_3 , and d_4 , the perimeter distances d_1 , d_2 , d_3 , and d_4 being from about 0.125 inch to about 5 inch.

5 17. The absorbent ice bag of claim 14 wherein the perimeter distances d_1 , d_2 , d_3 , and d_4 are at least 0.125 inch.

18. The absorbent ice bag of claim 14 wherein the absorbent pad defines a thickness t , the thickness t being from about 0.125 inch to about 1 inch.

10 19. The absorbent ice bag of claim 18 wherein the thickness t is from about 0.250 inch to about 0.750 inch.

20. The absorbent ice bag of claim 14 wherein the absorbent pad is manufactured from a
15 super absorbent polymer.

21. The absorbent ice bag of claim 14 wherein the absorbent pad is manufactured from a material selected from the group consisting of cellulose, cellulose derivatives, cotton, polypropylene, polyester, poly-N-vinylacetamide, cross-linked sodium polyacrylate and
20 combinations thereof.

22. The absorbent ice bag of claim 14 wherein the ice bag is manufactured from a material selected from the group consisting of polyethylene, polyester, polypropylene, cellulose esters,

cellulose ethers, nylon, polyvinyl alcohol acetals, polyvinyl chloride, polyvinyl chloride acetate, polystyral, methyl methacrylate, polyvinylidene chloride, ethylene octene copolymers, and combinations thereof.

5 23. The absorbent ice bag of claim 22 wherein the material is metallized.

24. The absorbent ice bag of claim 14 wherein the phase change material is ice.

25. The absorbent ice bag of claim 14 wherein the absorbent pad is hour glass shaped.

10

26. The absorbent ice bag of claim 14 wherein the ice bag is hour glassed shaped.

27. The absorbent ice bag of claim 14 wherein the ice bag is double hour glass shaped.

15 28. An absorbent ice bag for cold therapy, the absorbent ice bag comprising:

an ice bag defining a single-side surface area, the ice bag further defining a resealable opening;

an absorbent pad attached to the ice bag, the absorbent pad defining a pad area such that the pad area is larger than the single side-surface area, the pad area further defining an area

20 difference that is the difference in area between the pad area and the single-side surface area;

an unobstructed perimeter area formed from the area difference; and

at least a first containment pad and a second containment pad attached to the absorbent ice bag;

wherein a phase change material may added to the ice bag through the resealable opening, wherein the unobstructed perimeter area provides an unobstructed area for absorbing a bodily fluid on the absorbent pad, and wherein the containment pads focus the cold therapy.

- 5 29. The absorbent ice bag of claim 28 wherein the unobstructed perimeter area defines at least four perimeter distances d_1 , d_2 , d_3 , and d_4 , the perimeter distances d_1 , d_2 , d_3 , and d_4 being from about 0.125 inch to about 5 inches.
30. The absorbent ice bag of claim 28 wherein the perimeter distances d_1 , d_2 , d_3 , and d_4 are at
10 least 0.125 inch.
31. The absorbent ice bag of claim 28 wherein the absorbent pad defines a thickness t , the thickness t being from about 0.125 inch to about 1 inch.
- 15 32. The absorbent ice bag of claim 31 wherein the thickness t is from about 0.250 inch to about 0.750 inch.
33. The absorbent ice bag of claim 28 wherein the absorbent pad is manufactured from a super absorbent polymer.
- 20 34. The absorbent ice bag of claim 28 wherein the absorbent pad is manufactured from a material selected from the group consisting of cellulose, cellulose derivatives, cotton,

polypropylene, polyester, poly-N-vinylacetamide, cross-linked sodium polyacrylate and combinations thereof.

35. The absorbent ice bag of claim 28 wherein the ice bag is manufactured from a material
5 selected from the group consisting of polyethylene, polyester, polypropylene, cellulose esters, cellulose ethers, nylon, polyvinyl alcohol acetals, polyvinyl chloride, polyvinyl chloride acetate, polystyral, methyl methacrylate, polyvinylidene chloride, ethylene octene copolymers, and combinations thereof.

10 36. The absorbent ice bag of claim 35 wherein the material is metallized.

37. The absorbent ice bag of claim 28 wherein the phase change material is ice.

38. The absorbent ice bag of claim 28 wherein the absorbent pad is hour glass shaped.

15

39. The absorbent ice bag of claim 28 wherein the ice bag is hour glass shaped.

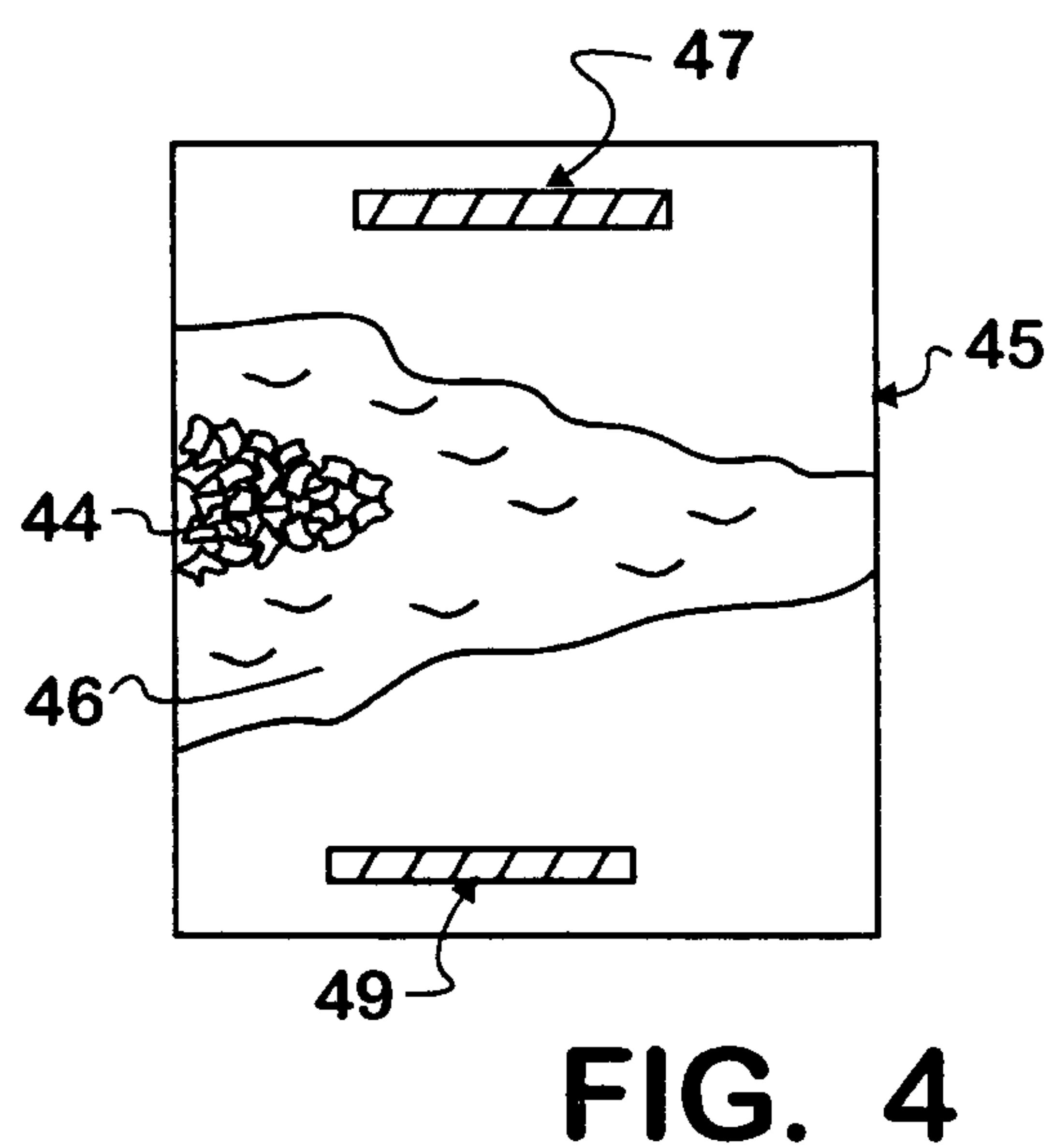
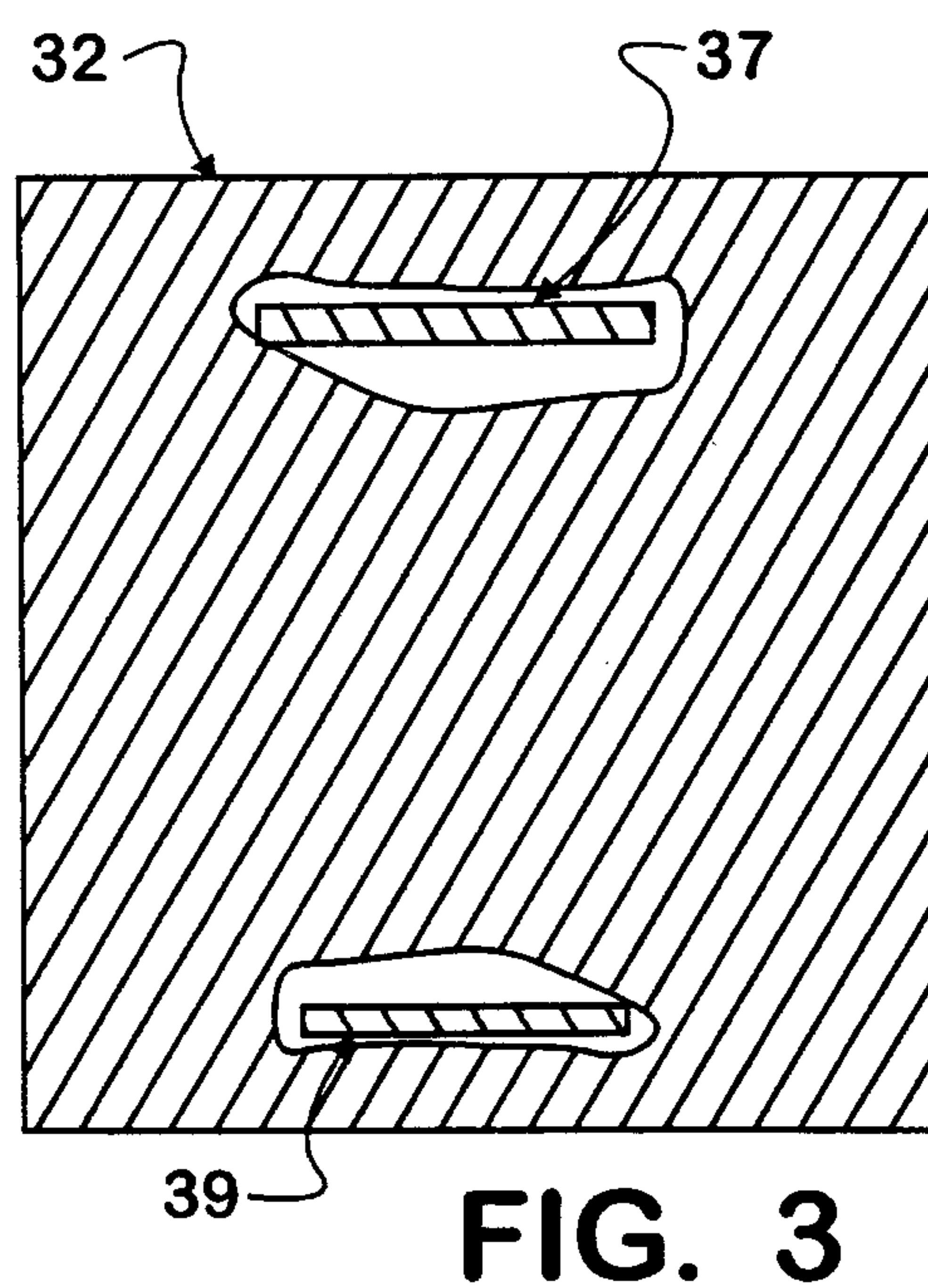
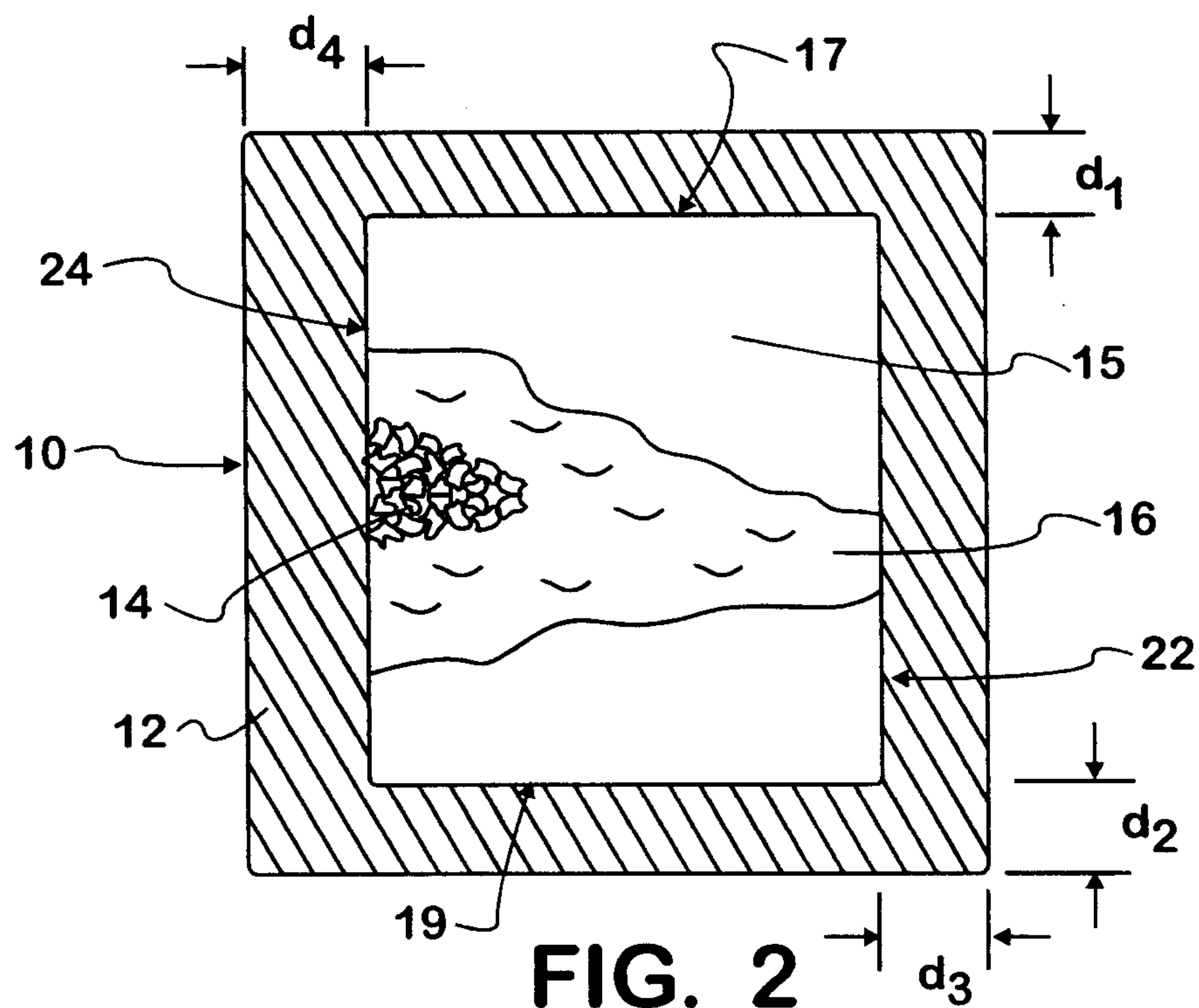
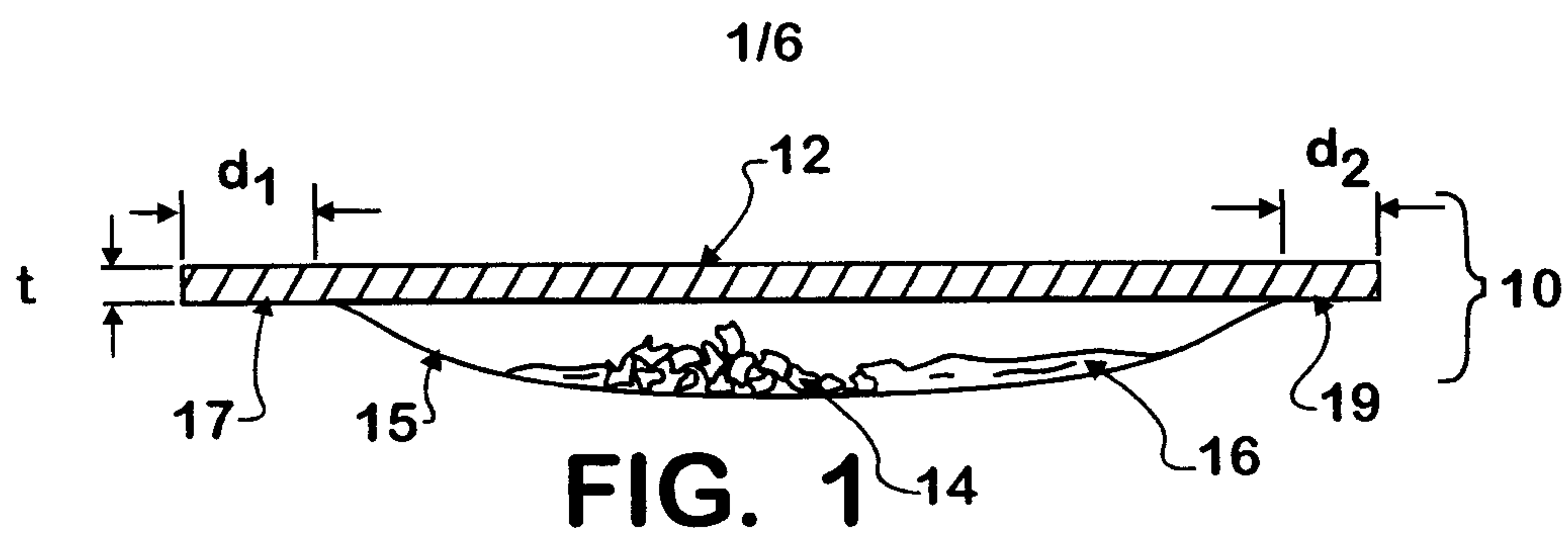
40. The absorbent ice bag of claim 28 wherein the ice bag is double hour glass shaped.

20 41. The absorbent ice bag of claim 28 wherein the first containment pad defines a thickness t_1 , the thickness t_1 being from about 0.125 inch to about 0.750 inch.

42. The absorbent ice bag of claim 41 wherein the thickness t_1 is from about 0.250 inch to about 0.500 inch.

43. The absorbent ice bag of claim 28 wherein the second containment pad defines a
5 thickness t_2 , the thickness t_2 being from about 0.125 inch to about 0.750 inch.

44. The absorbent ice bag of claim 43 wherein the thickness t_2 is from about 0.250 inch to about 0.500 inch.



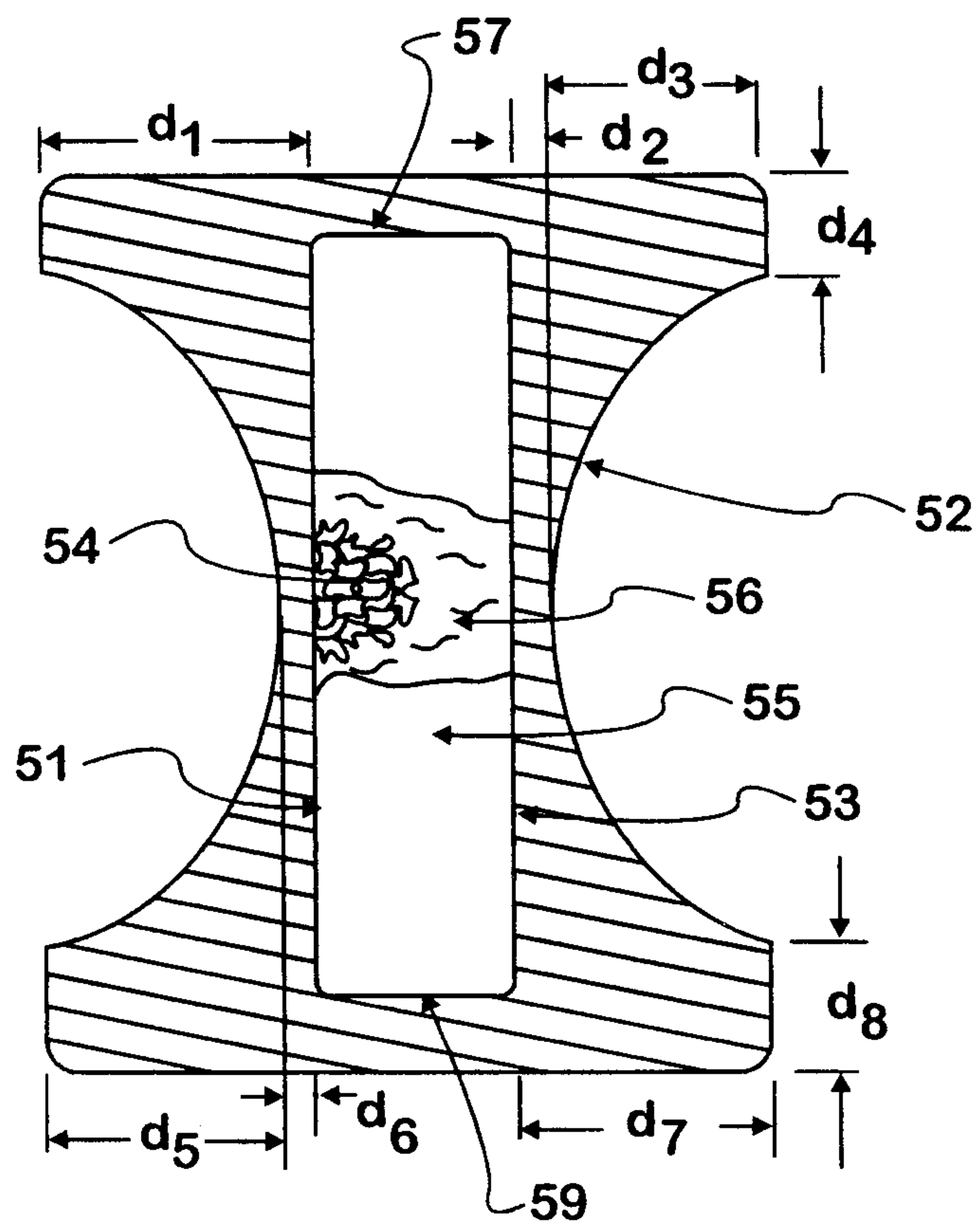


FIG. 5

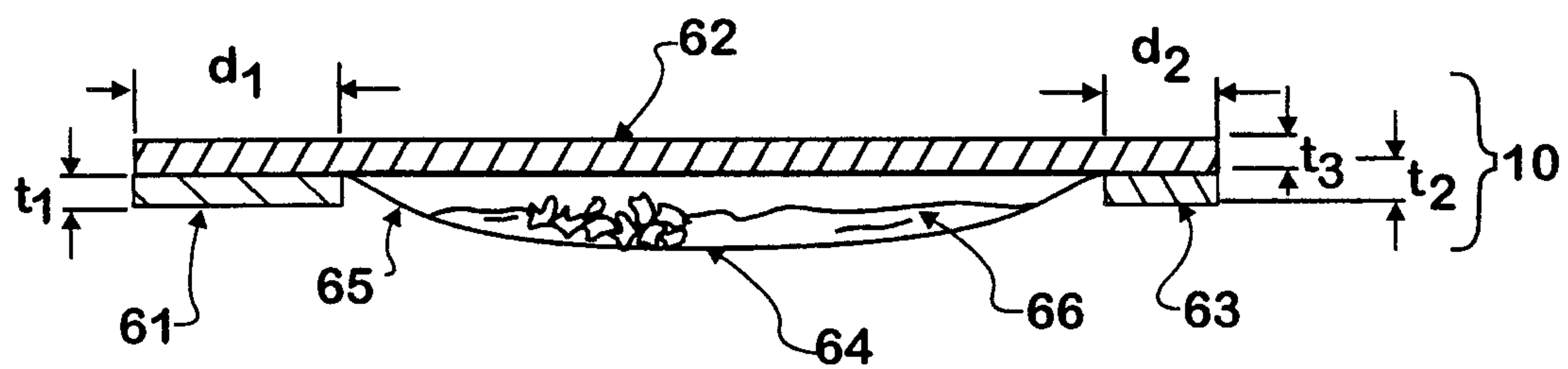
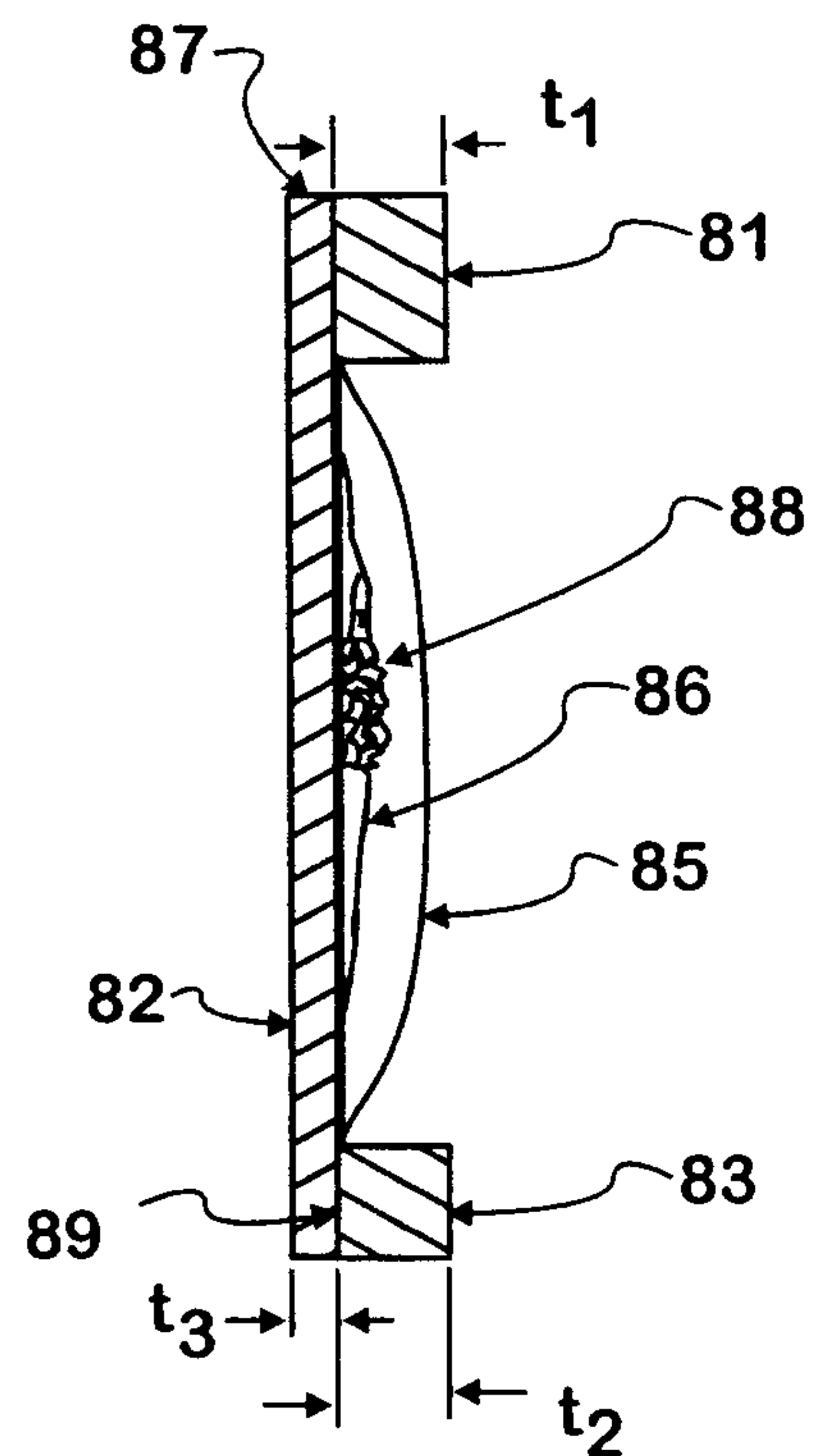
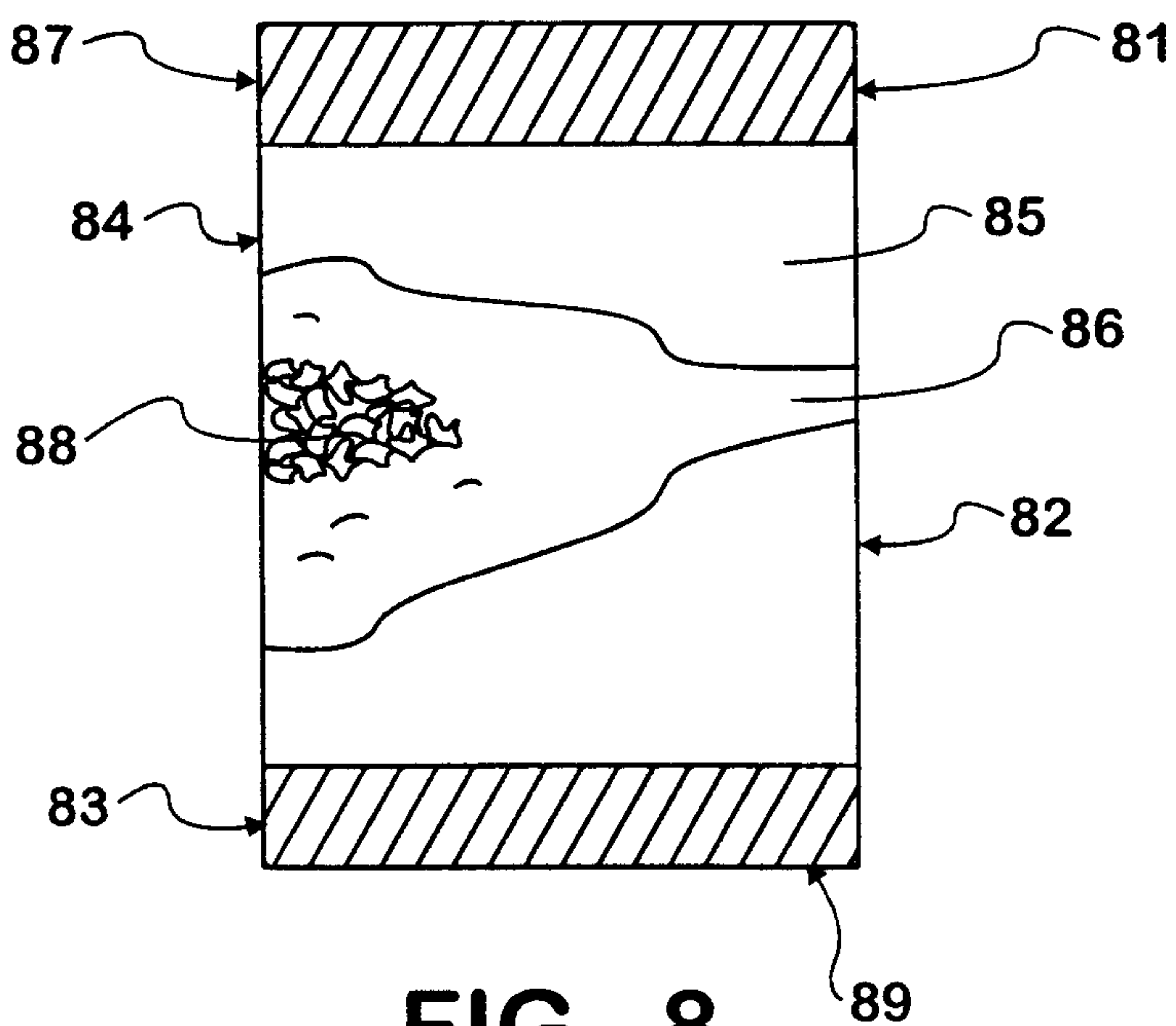
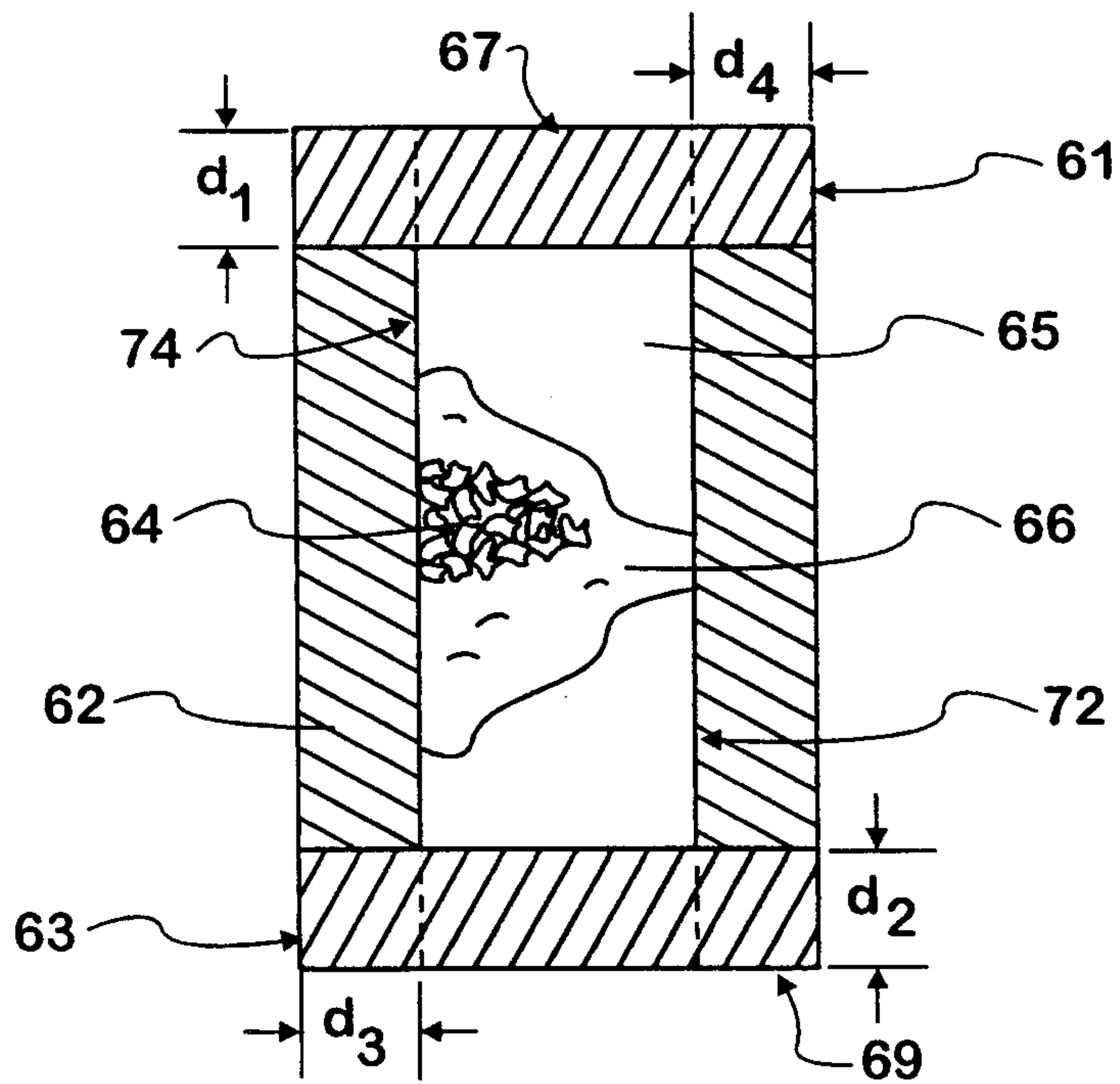
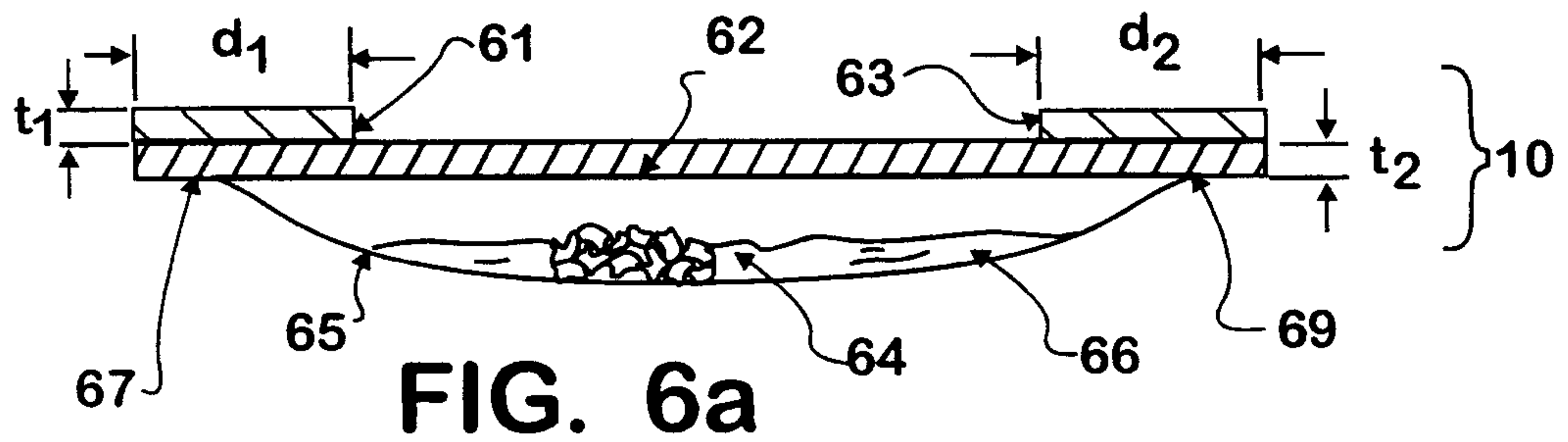
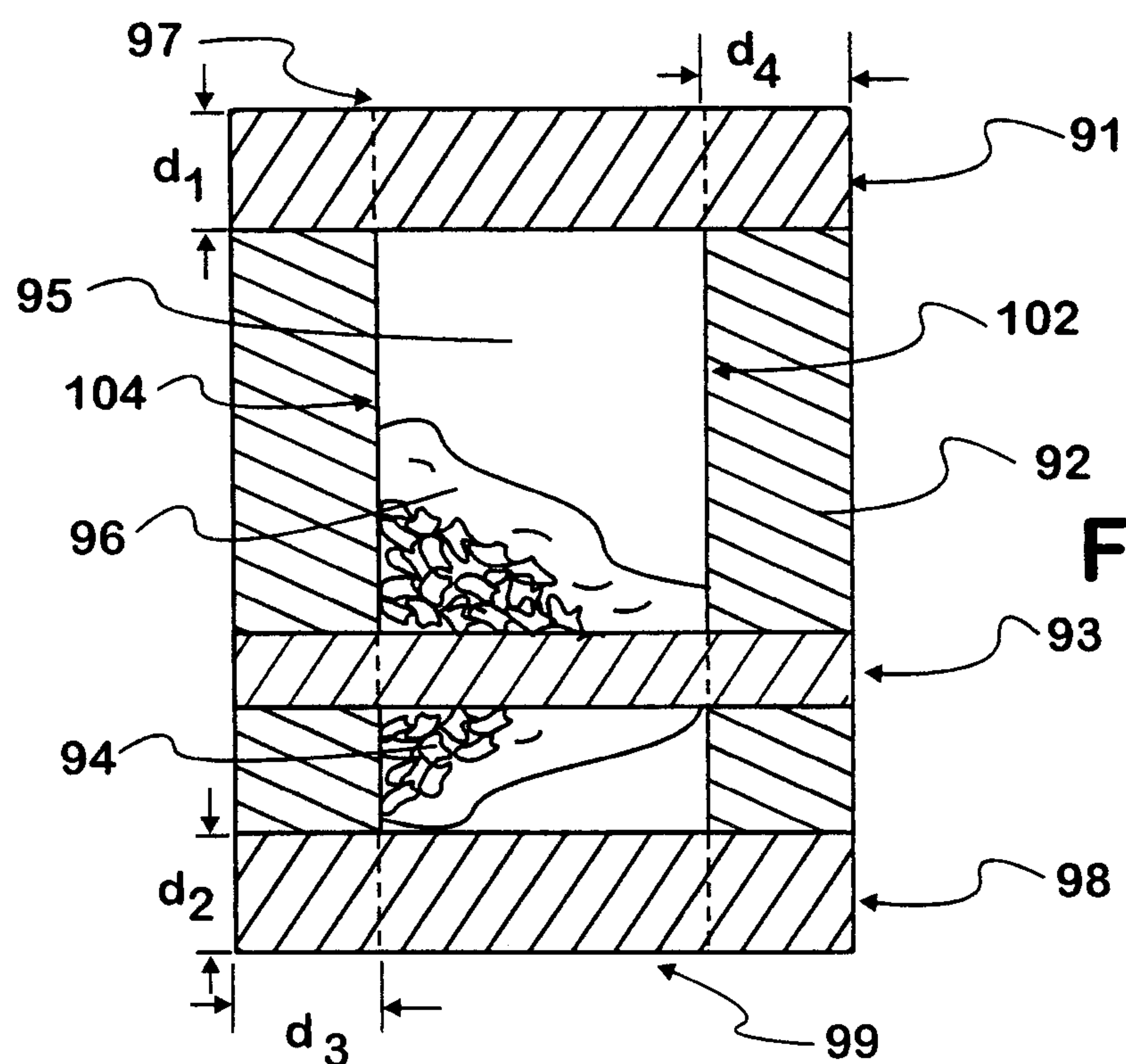
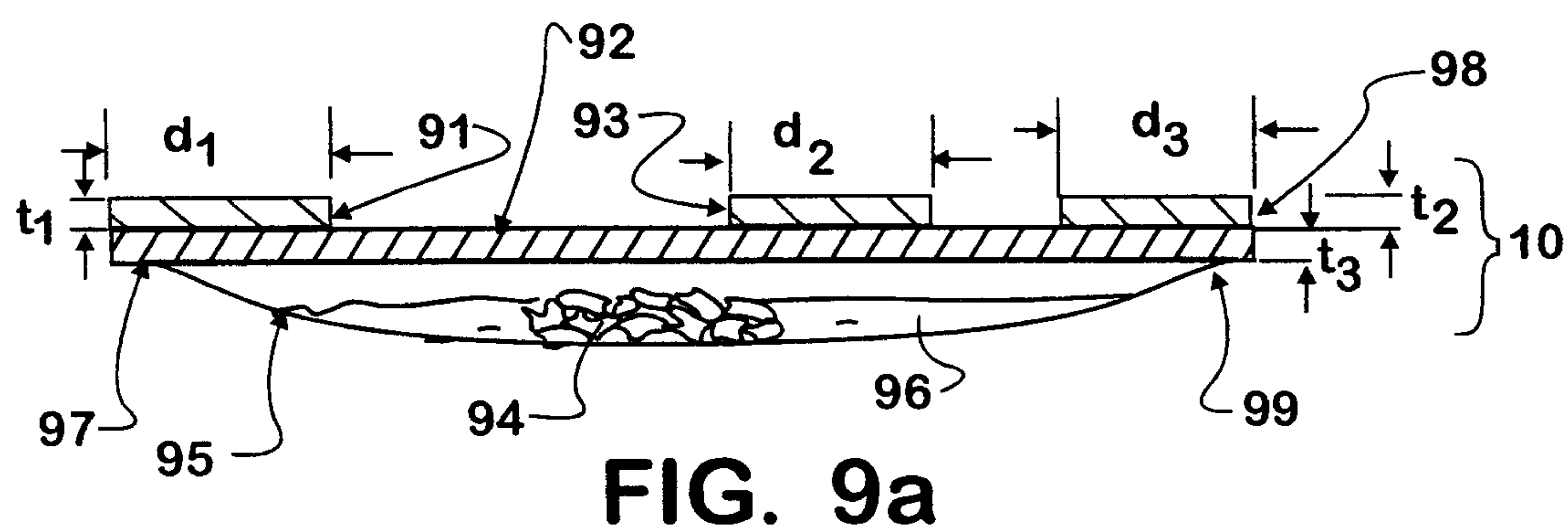
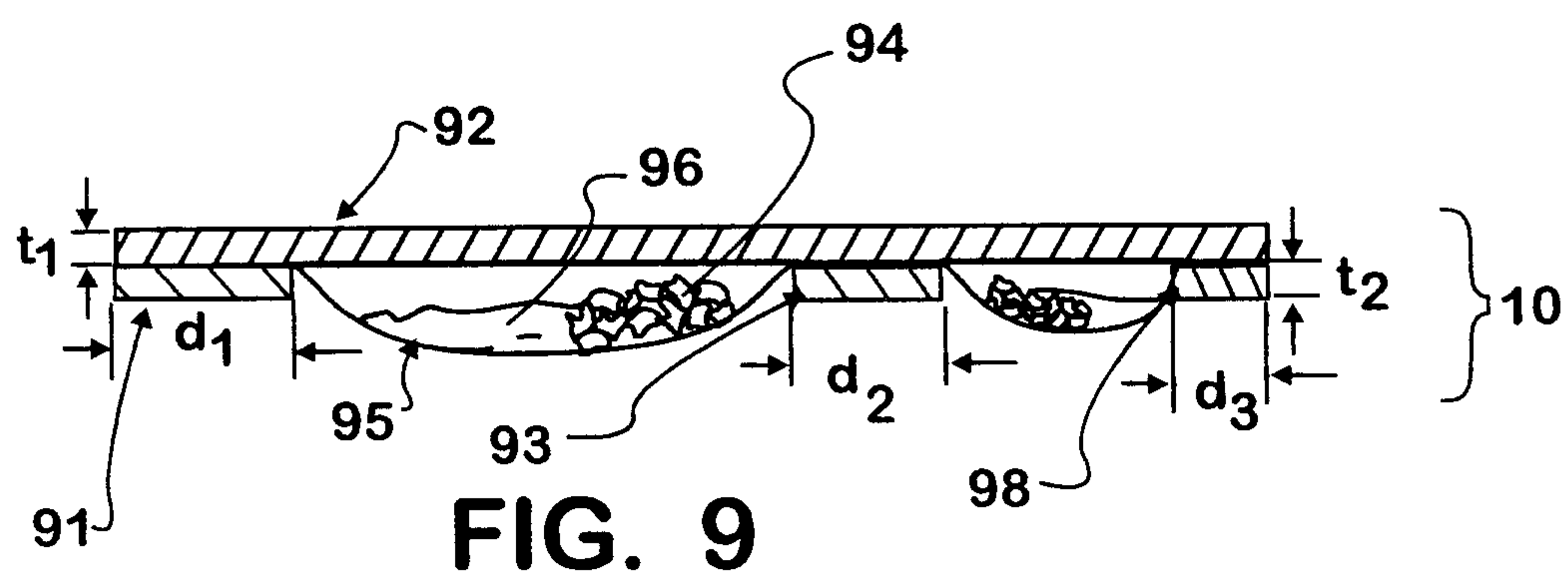


FIG. 6

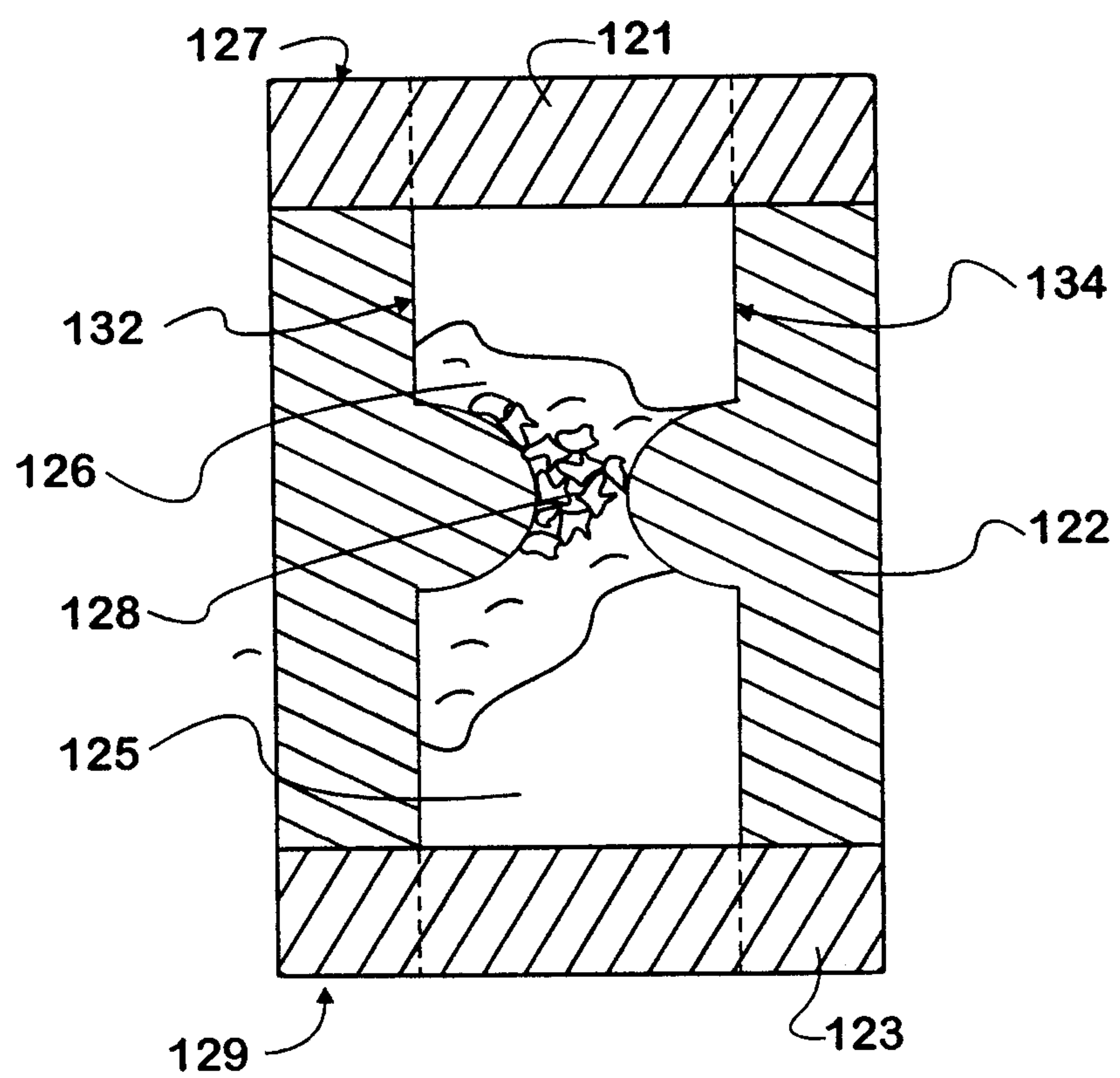
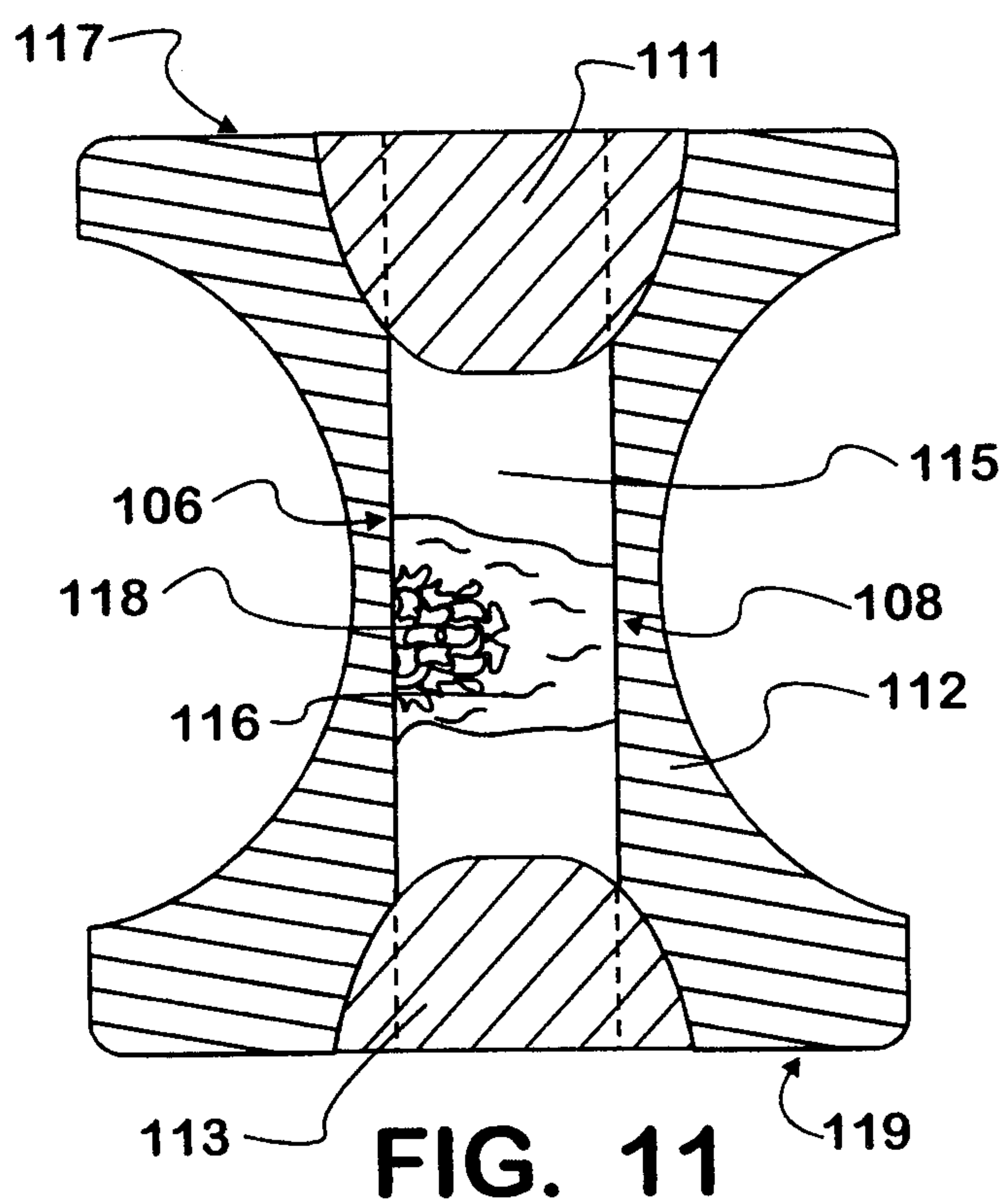
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**FIG. 10**

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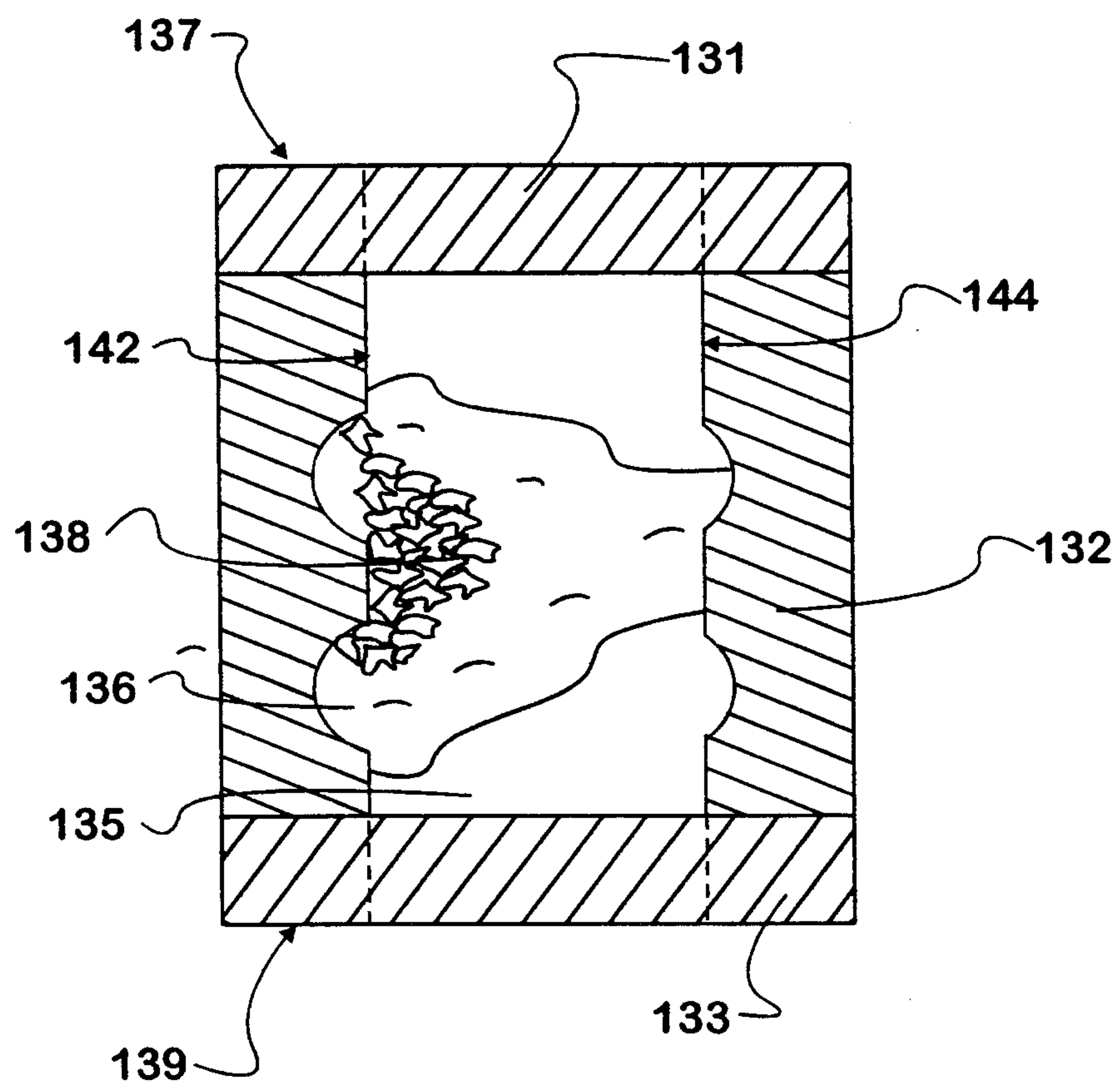


FIG. 13

