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(54) RETAINING WALL SYSTEM WITH INTERLOCKED WALL-BUILDING UNITS

STÜTZMAUER MIT INEINANDERGREIFENDEN ELEMENTEN

SYSTEME DE MUR DE SOUTENEMENT A UNITES DE CONSTRUCTION

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Description

Technical Field

[0001] The invention pertains to retaining walls and to methods of constructing retaining walls. In particular, it pertains to retaining walls built of units such as sand/soil bags or hardenable units such as fresh clay bricks, wherein the units in adjacent courses are connected together.

Background

[0002] Retaining walls are used in a wide variety of civil engineering and landscaping applications, for example to support slopes and embankments for highways and railways, support noise barriers, etc. Retaining walls are commonly made having a supporting face structure made of interconnecting blocks with soil or other fill placed and compacted in back of the wall, and with sheets of geogrid laid in the fill at various levels, extending back from the wall. The geogrid sheets, which stabilize the backfill, are often attached to the interlocking blocks.

[0003] It is known to build retaining walls of sandbags instead of interlocking blocks to hold the backfill. In the prior art, sandbags in retaining walls are not attached to each other, relying essentially on their mass to stabilize the wall. This limits the steepness and the height of retaining walls that can be build with sandbags. Sandbag retaining walls, in the prior art, are normally temporary, rather than permanent, structures.

[0004] Also, it is known to build retaining walls with blocks of various kinds. Such blocks, in the prior art, generally need to be made with interfitting parts or be affixed by concrete or the like in order to make a secure stable retaining wall.

[0005] Japanese Abstract JP-A-06-322730 published November 22, 1994 shows the use of a disc-like solid with a projection on both sides to prevent slippage between bags of ready-mix concrete in a retaining wall. However, such device can prevent slippage only between two vertically-adjacent bags. Japanese abstract JP-A-59-048525 published March 19, 1984 shows the use of sand and soil bags provided integrally on the ends of water-permeable sheets which extend into fill in back of a vertical bank.

Summary of Invention

[0006] The invention provides a permanent retaining wall structure in which the wall-building units, such as sand/soil bags, used to make the face of the structure are attached to wall-building units in adjacent courses, and preferably to geogrid sheets. The attachment is done by means of a plate having projections on both sides thereof which protrude into the wall-building units in adjacent courses, and which also protrude through the holes in the geogrid sheets, stabilizing the retaining wall structure and backfill.

[0007] In one embodiment of the invention, the wall-building units are bags of sand, soil or similar fill material. In this specification, "sand/soil bag" means a bag filled with any suitable fill material, including sand, soil, mixtures thereof and including fill mixed with seeds for grass or other plants. In another embodiment, the wall-building units are units that harden, or that can be made to harden, after they are placed in the wall and interconnected together by means of the attachment devices of the invention. Examples are freshly-formed bricks of clay or similar material prior to their hardening; or bags of cement or a mixture of cement and aggregate that can be made to harden by wetting them and allowing them to cure after they are set in place. Such wall-building units are collectively referred to as "hardenable building units" in this specification. Thus "wall-building units" can be either "sand/soil bags" or "hardenable building units," the distinction being that the former have fill that remains friable after the wall is made and the latter harden or cure after the wall is constructed, forming rigid units.

[0008] The invention provides a retaining wall structure comprising a first plurality of wall-building units positioned adjacent to one another forming a first, horizontally-extending course; a second plurality of wall-building units positioned adjacent to one another above the first course forming a second course; and interconnecting members placed between the first and second courses attaching them together. The interconnecting members comprise a plate having an upper side and a lower side, a first set of projections on the lower side and a second set of projections on the upper side, the projections being capable of protruding into a wall-building unit. The interconnecting members are positioned between the wall-building units of the first and second courses so that the first set of projections protrudes into a unit in the lower course and the second set of projections protrudes into a unit in the upper course. The interconnecting members may also be placed on the ground or on a footing, under the base course of wall-building units.

[0009] The retaining wall structure can optionally comprise a sheet of geogrid extending from between adjacent courses into backfill behind the retaining wall. The geogrid sheet is positioned so that projections of the interconnecting member protrude through holes in the sheet.

[0010] The invention also provides an interconnecting member for attaching a first horizontally-extending course of wall-building units to a second horizontally-extending course positioned vertically adjacent to the first course. The member comprises a plate having an upper and lower side with a set of projections on each side capable of protruding into a wall-building unit. The projections can also serve the function of providing attachment means for a sheet of geogrid, but preferably,

the interconnecting member includes a set of geogrid-holding members on the upper side of the plate that are shaped and adapted specifically to protrude through holes in a sheet of geogrid. There may be retaining caps affixed to the geogrid-holding members for retaining a sheet of geogrid thereon. The interconnecting member may also have a flange around the base of each projection on the upper side of the plate, having a lip for sealing against a wall-building unit.

[0011] The retaining wall structure can also optionally include cover plates to improve the durability and appearance of the wall.

[0012] The invention also provides a method of constructing a retaining wall structure having a plurality of courses of wall-building units. The method comprises the steps of placing a first plurality of wall-building units adjacent to one another to form a first, horizontally-extending course; placing interconnecting members on the first course, the interconnecting members having a first set of projections on their lower side and a second set of projections on their upper side, such that the projections in the first set protrude into wall-building units in the first course of wall-building units; and placing a plurality of wall-building units adjacent to one another to form a second course above the first course, such that the projections of the second set protrude into wall-building units of the second course. The method of constructing a retaining wall can include the step of placing a sheet of geogrid extending from between the courses of wall-building units into the backfill, with projections of the interconnecting member protruding through holes in the geogrid to anchor it in place.

Brief Description of Drawings

[0013]

Fig. 1 is a cross-sectional end view of a retaining wall structure according to one embodiment of the invention;

Fig. 2 is a perspective view of one embodiment of an interconnecting member;

Fig. 3 is a cross-sectional view on the line 3 - 3 of Fig. 2;

Fig. 4 is a perspective view of a course of sand/soil bags with interconnecting members positioned thereon;

Fig. 5 is a cross-sectional view through adjacent, interconnected sand/soil bag courses;

Figs. 6(a) to (e) illustrate steps in a method of constructing a retaining wall structure;

Fig. 7 - 10 are perspective views of alternate embodiments of the interconnecting member;

Figs. 11 (a) to (c) are perspective views of the cover plate assembly and the parts thereof;

Fig. 12 is a perspective view of a wall with the cover plate assemblies affixed thereto;

Fig. 13 is a perspective view of a further embodiment of the interconnecting member;

Fig. 14 is a cross-sectional view on the line 14 - 14 of Fig. 13, and including an attached sheet of geogrid;

Fig. 15 is a perspective view of a further embodiment of the interconnecting member;

Fig. 16 is a cross-sectional view on the line 16 - 16 of Fig. 15, and including an attached sheet of geogrid;

Fig. 17 is a perspective view of a further embodiment of the interconnecting member;

Fig. 18 is cross-sectional view on the line 18 - 18 of Fig. 17, and including an attached sheet of geogrid;

Fig. 19 is a perspective view of the further embodiment of the interconnecting member;

Fig. 20 is a cross-sectional view on the line 20 - 20 of Fig. 19, and including an attached sheet of geogrid;

Fig. 21 is a perspective view of a further embodiment of the interconnecting member;

Fig. 22 is a cross-sectional view on the line 22 - 22 of Fig. 21, and including an attached sheet of geogrid;

Fig. 23 is a perspective view of the further embodiment of the interconnecting member;

Fig. 24 is a cross-sectional view on the line 24 - 24 of Fig. 23, and including an attached sheet of geogrid;

Fig. 25 is a perspective view of a further embodiment of the interconnecting member;

Fig. 26 is a cross-sectional view on the line 26 - 26 of Fig. 25, and including an attached sheet of geogrid;

Fig. 27 is a perspective view of a further embodiment of the interconnecting member;

Fig. 28 is a cross-sectional view on the line 28 - 28 of Fig. 27, and including attached sheet of geogrid;

Fig. 29 is a perspective view of a further embodiment of the interconnecting member;

Fig. 30 is a cross-sectional view on the line 30 - 30 of Fig. 29, and including an attached sheet of geogrid; and

Figs. 31 - 33 are perspective views of three further embodiments of the interconnecting member.

Description

[0014] Referring to Fig. 1, retaining wall structure **10**, constructed on ground **12**, comprises a plurality of horizontally-laid courses of sand/soil bags **14,** the courses being arranged vertically in a wall structure. The face of the wall may be sloped, rather than vertical, if so preferred for a particular application. The bags **14** are preferably made of a geotextile material which is durable and of a weave which permits water to flow in and through the bag, and seedlings to grow out, while retaining fine soil particles within the bags. The material of the bags **14** should not be biodegradable, for durability of the wall.

[0015] Backfill **16** is compacted behind and supported by sand/soil bags **14.** Geogrid sheets **18** extend horizontally back into the backfill from between courses of sand/soil bags **14,** affixed thereto as described hereunder. Interconnecting members **26** are placed between the adjacent courses of sand/soil bags **14.**

[0016] Referring to Figs. 2 and 3, interconnecting member **26** comprises a plate **22,** generally rectangular and planar in a preferred embodiment, with a plurality of projections **24** extending vertically from both sides of the plate **22.** Projections **24** are sufficiently strong and pointed to protrude into sand/soil bags **14.** Interconnecting member **26** is preferably made of plastic or aluminum or other non-corrosive metal or material.

[0017] Referring to Figs. 4 and 5, interconnecting members **26** are used in the construction of a retaining wall structure **10** by placing them on top of sand/soil bags **14** in a course so that projections **24** on the lower side protrude into the bags. A second course of bags is placed on top of the first course and of interconnecting members **26.** The projections on the upper side of member **26** protrude into the bags in the second course, and the weight of those sand/soil bags presses the interconnecting members so that the projections on their lower side protrude fully into the bags in the first course. The projections **24** can be configured to fully penetrate the bags or, preferably, to simply indent them. In either case, the projections are considered to "protrude" into the bags.

[0018] The interconnecting members **26** are also used to anchor geogrid sheets to the sandbags. Geogrid sheets **18** are known and commercially available plastic mesh products commonly used for soil reinforcement. Referring to Fig. 5, geogrid sheet **18** has a plurality of holes **28** therein. The sheet **18** is affixed to the face of the wall by placing the edge of the sheet over interconnecting members **26** atop a course of sandbags **14** so that the projections **24** on the upper side of the interconnecting member and adjacent its back edge protrude through holes **28** in the geogrid. When the next upper course of bags **14** is put on top, projections **24** on the upper side of the interconnecting member, extending through the geogrid sheet, protrude into the underside of the bags in said upper course.

[0019] Instead of being placed over an interconnecting member **26,** the geogrid sheet can be placed directly on top of a course of sand/soil bags and the interconnecting members placed over it, with the projections **24** on the lower side of the member **26** protruding down through holes **28** in the geogrid sheet and into the bags. In other words, the geogrid can be placed under the interconnecting member instead of over it.

[0020] Geogrid sheets are installed at selected levels during the construction of the wall, for example on top of every third course of bags, or as required for a particular application.

[0021] Fig. 6 illustrates the steps in a preferred method of constructing a retaining wall structure according to the invention. Referring to Fig. 6(a), a trough **30** is dug in ground **12,** with the base of the trough being suitably prepared with a levelling pad or a concrete footing in order to support the wall. Such preparation is conventional in the building of retaining walls. A first course of sand/soil bags **14** is laid in trough **30** (Fig. 6(b)). A row of interconnecting members **26** is placed on top of bags **14** in the first course (Fig. 6(c)). Next, a further course of bags **14** is laid, and backfill **16** is placed and compacted in back of the sand/soil bags. A row of interconnecting members **26** is laid on it and then a further course of bags **14** (Fig. 6(d)). Then, a row of interconnecting members **26** is placed along the uppermost course of bags **14** and a sheet of geogrid **18** is placed on it, extending back along the surface of the backfill **16** (Fig. 6 (e)). The construction of the wall is continued in the same manner, until a retaining wall of the required height is completed, as shown in Fig. 1.

[0022] In some applications, it is desirable to place interconnecting members **26** on the ground under the base course of bags **14.** Here, a row of interconnecting members **26** is placed on the levelling pad or concrete footing and the first or base course of bags **14** is placed on it. The wall is then further constructed as described above. This reduces movement or slippage of the base course of bags and assists in their being properly positioned.

[0023] According to one embodiment of the invention, bags **14** include seeds of grass or other ground covers mixed in their fill. After the retaining wall is built, the bags are watered, naturally or artificially, and the ground cov-

er plants grow out of the bags, providing a green foliage face on the retaining wall.

[0024] According to another embodiment of the invention, the bags do not include seeds but are instead made in shapes which, in a completed wall, will form an attractive wall face. For example, the face side of the bags can be rectangular, square or hexagonal, to permit the construction of a wall face with any of various interlocking patterns. The bags can also be of transparent material, such as plastic, and in such case the fill can be decoratively colored. For example, the fill can be green-colored gravel.

[0025] Figs. 7 - 10 illustrate alternative embodiments of the interconnecting member. In these embodiments, the interconnecting member has different shapes to permit optimal interlocking of bags of various shapes and in various arrangements. Rounded or shapeless bags may have gaps between adjacent bags in a course such that an interconnecting member extending across such bags is not fully supported across such gap by the lower bags. In such cases it is preferable to use an interconnecting member with a cut-out in the unsupported area, so that an upper bag does not press down on an unsupported part of the interconnecting member. In Fig. 7, interconnecting member **126** comprises plate **122** with projections **24** on both sides thereof. The plate **122** is generally C-shaped with a space or cut-out **123** between the arms of the C. The interconnecting member **126** is positioned between courses of sand/soil bags such that the space **123** is above the gap between adjacent bags in the lower course. A portion of the bag in the upper course extends through the space **123** and rests directly on the lower bags. Also, the design of Fig. 7 permits a reduction in the amount of plastic or other material required for the member and is accordingly less costly. A similar design is shown in Fig. 10, in which interconnecting member **226,** having projections **24** on both sides thereof, is in the form of a generally trapezoidal frame with a cut-out **52** in the middle thereof. As with the embodiment of Fig. 7, this interconnecting member permits part of the upper bag to rest directly on the lower bags while still interlocking bags in adjacent courses together. The narrower side of the trapezoidal frame is intended to be positioned rearward, with the geogrid attaching only to said narrower side. Again, such design effects a cost savings with regard to the amount of material required to make the interconnecting member.

[0026] Two further alternate configurations are shown in Fig. 8 and Fig. 9. In Fig. 8, interconnecting member **326** is a plate that is hemi-cylindrical in shape. In Fig. 9, interconnecting member **426** is a plate that is L-shaped. Both these forms of interconnecting members are adapted for use in interlocking sand/soil bags of the appropriate shapes. For example, the plate of Fig. 9 can be used where the bags **14** have a face or cross-section that is hexagonal. The plate of Fig. 8 can be used where the cross-section of the bags is round. The shaping of the plate, as in Figs. 8 and 9, to fit shaped bags ensures secure contact between the plate and the bags. It will be apparent that the interconnecting member can be configured as required to interlock sand/soil bags of any desired shape.

[0027] In another embodiment of the invention, the wall-building units are hardenable building units. For example, the hardenable building units can be freshly-formed bricks of clay, concrete or similar material used prior to their hardening; or they can be bags of cement or a mixture of cement and aggregate that can be made to harden by wetting them and allowing them to cure after they are set in place; or any similar material that is sufficiently soft to be penetrated by the projections of the interconnecting members but which hardens (for example by drying out, as in the case of a clay or concrete brick) or that can be made to harden (for example by wetting and then allowing to cure, as in the case of a bag of cement or cement and aggregate) after it is set in place. The hardenable building units must be firm enough at the time of use to retain their form and to be stackable, i.e. capable of being stacked without collapsing or breaking. In the case of freshly-formed clay or concrete blocks, such blocks should be semi-hardened. A retaining wall made in accordance with this embodiment of the invention, using hardenable building units, is made in the same manner as described above for retaining walls where the wall-building units are sand/soil bags. Here, the method of making a retaining wall includes the additional step of allowing, or causing, the hardenable building units to harden. For example, where the hardenable building unit is a clay brick, it is used in the construction of the retaining wall when it is still soft enough to be easily penetrated by the projections **24** of plate **122.** As the wall is built, the clay bricks gradually cure and harden. Where the hardenable building unit is a bag of cement, or cement and aggregate, it is used in the same manner as the sand/soil bags as described above to construct the retaining wall; then, the bags are wetted and allowed to cure, causing the cement or cement and aggregate in each bag to harden. As described above in respect of the construction of walls made from sand/soil bags, a row of interconnecting members **26** can also be used under the base course of hardenable building units.

[0028] Figs. 13 and 14 illustrate a further embodiment of the interconnecting member. Interconnecting member **60** comprises a plate **62,** generally rectangular and planar in a preferred embodiment, with a plurality of projections **64** extending perpendicularly from both sides of the plate. A set of geogrid-holding members **66** extends perpendicularly from the upper side of the plate along an edge thereof. Unlike the embodiment of Fig. 2, in which projections **24** serve both to attach the geogrid and to protrude into the wall-building units, geogrid-holding members **66** of interconnecting member **60** are specifically shaped to provide a very secure means of attachment to the geogrid. Geogrid-holding members **66** have relatively steep, almost vertical walls, and are

sized and arrayed in a row along the edge of the plate to fit snugly into adjacent holes along the edge of the sheet of geogrid. Cap **67,** which can be made of rubber or similar material, fits snugly over the top end of a member **66** and can optionally and preferably be put in place on one or more of members **66** after the geogrid **18** is fitted over the members **66** in order to better secure the attachment of the geogrid to the interconnecting member. The outer diameter of the cap **67** is larger than the diameter of the holes in the geogrid, thus restraining the geogrid from slipping up and off the members **66.** The geogrid sheet **18** fits and is held on the member **66** between the plate **62** and the lower edge of the cap **67.**

[0029] Projections **64** are preferably formed in plate **62** by pressing and molding the plate, resulting in a corresponding depression **68** in the opposite side of the plate. However, the projections can also be solid, as in the embodiment of Fig. 2.

[0030] As shown in Figs. 13 and 14, a protruding ring or flange **70** is provided around the base of each projection **64** on the upper side of plate **62.** The flange has an upper end or lip **72.** Flange **70** has particular application when the interconnecting member is used in a wall in which the wall-building units are sand/soil bags. Here, there is a possibility that some of the projections **64** may puncture the bag placed on top of the interconnecting member, causing a leakage of sand from the bag. The function of flange **70** is to reduce such leakage by pressing against the bag and forming a seal around the projection **64** sufficient to reduce or stop the leakage of sand or soil from the hole. Optionally, and as illustrated in Figs. 13 and 14, a flange **70** may also be provided on the lower side of the plate **62** to reduce leakage from a bag underneath plate **62** that is punctured by a projection **64** on the underside of plate **62.**

[0031] The interconnecting member **60** can be configured so that, in use, the geogrid-holding members **66** are covered by the sand/soil bags that are above them. In this case, the distance between the row of members **66** and the row of projections **64** that is nearest to it is relatively small, so that the sand/soil bag on top of the interconnecting member **60** covers both the projections **64** and the geogrid-holding members **66.** Alternatively, the interconnecting member **60** can be configured so that, in use, the geogrid-holding members **66** are not covered by the sand/soil bags that are above them. In this case the distance between the row of members **66** and the row of projections **64** that is closest to it is relatively large, so the section of the plate **62** bearing members **66** extends beyond sand/soil bags and is not covered by them. In this case, holes (not illustrated in the drawings) can be provided in plate **62** in the region between the row of geogrid-holding members **66** and the nearest row of projections **64** to facilitate water drainage through the retaining wall, and also to economize on material, i.e. to permit cheaper fabrication of the interconnecting members. It will be understood that these features, though described in relation to the embodiment of Figs. 13 and 14, can equally be applied to the embodiments illustrated in Figs. 15 - 16, 17 - 18, 19 - 20, 21 -22, 23 - 24, 25 - 26, 27 - 28 and 29 - 30.

[0032] Figs. 15 and 16 show an alternative embodiment of the interconnecting members of Figs. 13 and 14. The structure of interconnecting member **80** is the same as that of interconnecting member **60** shown in Fig. 14 except for the lip of the flange. Interconnecting member **80** has a flange **74** with a lip having two concentric ridges **76** with a concentric depression **78** therebetween. Both ridges **76** press against a sand/soil bag placed on top of the interconnecting member **72,** forming, in effect, a double seal. The concentric ridges **76** on a lip may be the same height or different heights. In the latter case, the outer ridge **76** is preferably somewhat higher than the inner ridge, as illustrated in Figs. 15 and 16, the object being to achieve the most effective seal possible around a projection **64** against a sand/soil bag punctured thereby. As for the embodiment of Figs. 13 - 14, the flange **70** and ridges **74** may be on the upper side only of the interconnecting member or, optionally, on both the upper and lower sides.

[0033] It will be apparent that the geogrid-holding members **66** of the interconnecting member **60, 80** is a feature that can also be incorporated into the structure of the embodiments of the interconnecting member shown in Figs. 2, 7 and 10; it is not limited to use in interconnecting members having flanges as depicted in Figs. 13 - 16. Nor is the feature of flanges limited to interconnecting members having geogrid-holding members **66;** either feature can be included in an interconnecting member with or without including the other.

[0034] Figs. 17 and 18 illustrate a further embodiment of the interconnecting member, indicated by reference numeral **90,** which is substantially the same as the embodiment of Figs. 13 and 14 except that the feature of sealing flanges around the projections **64** is not included.

[0035] Figs. 19 - 30 illustrate embodiments of the interconnecting member in which the geogrid-holding members are configured in other forms for effective attachment to a sheet of geogrid.

[0036] Referring first to Figs. 19 - 24, geogrid-holding member **94** is generally L-shaped, having a first, upright part **96** that projects upward from the plate **62,** and a second, horizontal part **98** extending from the upright part towards the projection **64.** When a sheet of geogrid **18** is fitted over retaining members **94,** by inserting part **98** into a hole in the geogrid and pulling the geogrid down onto the upright part **96,** the horizontal part **98** restrains the sheet from slipping off the retaining members **94.**

[0037] Figs. 19 and 20 illustrate an embodiment of the interconnecting member, indicated by reference numeral **95,** having geogrid-holding members **94.** The structure of the remainder of the interconnecting member **95** is the same as the embodiment illustrated in Figs. 13 - 14.

[0038] Figs. 21 and 22 illustrate a further embodiment of the interconnecting member, indicated by reference numeral **100,** having geogrid retaining members **94.** The structure of the remainder of the interconnecting member **100** is the same as the embodiment illustrated in Figs. 15 - 16.

[0039] Figs. 23 and 24 illustrate a further embodiment of the interconnecting member, indicated by reference numeral **102,** having geogrid-holding members **94.** The structure of the remainder of the interconnecting member **102** is the same as the embodiment illustrated in Figs. 17 - 18.

[0040] Referring next to Figs. 25 - 30, geogrid holding member **104** is a tapered post with a relatively narrow base **109** and a relatively wide top **108.** Member **104** is generally rectangular in horizontal cross-section. The side **106** nearest the projections **64** slopes towards the projections **64** in the upward direction. The top **108** of the member **104** is sized and configured to fit snugly into a hole in a sheet of geogrid. When a sheet of geogrid **18** is fitted over a set of geogrid-holding members **104** on an interconnecting member, the taper and the wide top of the geogrid-holding member **104** restrains the sheet from slipping off.

[0041] Figs. 25 and 26 illustrate an embodiment of the interconnecting member **110** having geogrid-holding members **104.** The structure of the remainder of the interconnecting member **110** is the same as the embodiment illustrated in Figs. 13 - 14.

[0042] Figs. 27 and 28 illustrate a further embodiment of the interconnecting member, indicated by reference numeral **112,** having geogrid-holding members **104.** The structure of the remainder of the interconnecting member **112** is the same as the embodiment illustrated in Figs. 15 - 16.

[0043] Figs. 29 and 30 illustrate a further embodiment of the interconnecting member, indicated by reference numeral **114,** having geogrid-holding members **104.** The structure of the remainder of the interconnecting member **114** is the same as the embodiment illustrated in Figs. 17 - 18.

[0044] Interconnecting members according to the invention are also used in applications which do not include the use of geogrid, or in which geogrid is used but is not attached to the retaining wall. For such applications, the interconnecting member does not include geogrid-holding members as described above. Figs. 31 - 33 illustrate further embodiments of such interconnecting members. Fig. 31 shows an interconnecting member **116** which is similar in structure to the one illustrated in Figs. 17 - 18, but does not include any geogrid-holding members. Fig. 32 shows an interconnecting member **118** which is similar in structure to the one illustrated in Figs. 13 - 14, but does not include any geogrid members. Fig. 33 shows an interconnecting member **120** which is similar in structure to the one illustrated in Figs. 15 - 16, but does not include any geogrid-holding members.

[0045] Retaining walls of the invention can optionally include cover plates which attach to the face of the wall. Referring to Figs. 11 and 12, the cover plate assembly **30** has a generally rectangular cover plate **32,** which can be made of wood, concrete, plastic or other materials. Plate **32** has opposed edges **34, 36** and **38, 40** and is provided with a bore **42** in each corner adapted to receive an attachment rod **44.** As shown in Fig. 11(b), attachment rod **44** has a sinuous portion **46** and point **48** at one end and is threaded at the other end to engage into nut **50** which has head **52.** Attachment rod **44** is affixed to cover plate **32** by inserting it through bore **42** and engaging it with nut **50.**

[0046] Cover plate assembly **30** has particular application to retaining walls of the invention when made of sand/soil bags, or of hardenable building materials such as bags of cement and aggregate (rather than to walls made of freshly-formed molded blocks) to improve the durability and appearance of such walls. A cover plate assembly is attached to the wall by pressing the pointed ends of rods **44** through the bags until the inner side of the cover plate **32** abuts the wall. The sinuous portions **46** of the rods **44** enhance the engagement of the rods in the fill material of the sand/soil bags or in the material of the hardenable building units. Additional cover plate assemblies are affixed to the wall, abutting each other, to form a substantially complete cover. As shown in Fig. 11, the opposed edges **34, 36** and **38, 40** are alternately concave and convex, so the edges of abutting covers nest together to align the covers and provide some engagement. Preferably, the covers are positioned so as to a form a staggered, brick wall-type array, illustrated in Fig. 12.

[0047] Rods **44** can optionally have different means for engagement in the fill material of the sand/soil bags or in the hardenable building units instead of sinuous portion **46.** For example rods **44** can have threads, ridges or other structures for engagement.

[0048] As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the scope thereof. For example, the interconnecting member can be made flexible to conform to the shape of the wall-building units. The projections on it can be barbed, to enhance their attachment to the wall-building units, and they can project at angles other than the vertical from the plate. Accordingly, the scope of the invention is to be construed in accordance with the substance defined by the following claims.

Claims

1. An interconnecting member (26) for attaching a first horizontally-extending course of wall-building units (14) to a second horizontally-extending course of wall-building units positioned vertically adjacent to

said first course, said interconnecting member comprising a body (22) with projections (24) capable of protruding into said wall-building units in said first course and in said second course, **characterized in that** said body is a plate (22) having an upper side and a lower side, each said side having a plurality of said projections (24) thereon, said plate being capable of extending across at least part of two horizontally-adjacent wall building units (14) in said first course or in said second course, with said projections (24) on said upper side or said lower side positioned to protrude into said two horizontally-adjacent wall building units.

2. An interconnecting member (60, 80, 90, 95, 100, 102, 110, 112, 114) according to claim 1, further comprising a set of geogrid-holding members (66, 94, 104) on said upper side of said plate shaped and adapted to protrude through holes (28) in a sheet of geogrid (18).

3. An interconnecting member (60, 80, 90) according to claim 2 further comprising a retaining cap (67) affixed to said geogrid-holding member (66) for retaining a sheet of geogrid (18) thereon.

4. An interconnecting member (110, 112, 114) according to claim 2 wherein said geogrid holding member is a tapered post (104) having a top (108) wider than its base (109) or wherein said geogrid-holding member (94) is generally L-shaped, having a generally horizontal part (98) extending toward said projections (64).

5. An interconnecting member according to claim 2 further including drainage holes in the part of said plate between said geogrid-holding members (66, 94, 104) and said projections (64) nearest thereto.

6. An interconnecting member according to claim 1 further comprising a flange (70) around the base of said projections on said upper side of said plate (62), said flange having a lip (72) for sealing against a wall-building unit (14), said lip (72) of said flange optionally having two or more concentric sealing ridges (76).

7. An interconnecting member according to claim 1 wherein said plate (22) is rectangular or wherein said plate (122) is generally C-shaped or wherein said plate is hemi-cylindrical or wherein said plate is trapezoidal with a central cut-out (52) or wherein said plate is generally L-shaped.

8. A retaining wall structure comprising a first plurality of wall-building units (14) positioned adjacent to one another forming a first horizontally-extending course, a second plurality of wall-building units positioned adjacent to one another above said first course forming a second-horizontally-extending course, and interconnecting members (26) between said first course and said second course, said interconnecting members comprising a body (22) with projections (24) capable of protruding into said wall-building units in said first course and in said second course, **characterized in that** said body is a plate (22) having an upper side and a lower side, each said side having a plurality of projections (24) thereon, said plate extending across at least part of two horizontally-adjacent wall-building units (14) in said first course or said second course, with said projections (24) on said upper side or said lower side positioned to protrude into said two horizontally-adjacent wall-building units (14).

9. A retaining wall structure according to claim 8 further comprising a sheet of geogrid (18) extending from between said first and second courses into fill behind said retaining wall structure, said geogrid sheet (18) having a plurality of holes (28) therein, and said geogrid sheet being so positioned that said projections (24) of said first or second set protrude through said holes (28) of said geogrid sheet (18).

10. A retaining wall structure according to claim 8 wherein said interconnecting member (60, 80, 90, 95, 100, 102, 110, 112, 114) further comprises a set of geogrid-holding members (66, 94, 104) on the upper side of said plate shaped and adapted to protrude through holes (28) in a sheet of geogrid (18) and wherein said retaining wall structure further comprises a sheet of geogrid (18) extending from between said first and second courses into fill behind said retaining wall structure, said geogrid sheet having a plurality of holes (28) therein and said geogrid sheet (18) being so positioned that said geogrid-holding members (66, 94, 104) protrude through said holes (28) of said geogrid sheet (18).

11. A retaining wall structure according to claim 10 wherein said second course of wall-building units (14) covers said geogrid-holding members (66, 94, 104).

12. A retaining wall structure according to claim 8 wherein said wall-building unit (14) is a sand/soil bag, optionally having a transparent cover and decoratively-colored fill, the sand/soil bag optionally containing ground cover seeds or wherein optionally said wall-building unit (14) is a hardenable building unit.

13. A method of constructing a retaining wall structure having a plurality of courses of wall-building units (14), comprising the steps of placing a first plurality of wall-building units (14) adjacent to one another

to form a first horizontally-extending course, placing interconnecting members (26) on said first course, said interconnecting members comprising a body (22) with projections (24) capable of protruding into said wall-building units (14) in vertically adjacent courses, and placing a second plurality of wall-building units (14) adjacent to one another to form a second horizontally-extending course above said first course such that said projections (24) protrude into said wall-building units (14) of said second course, **characterized in that** said body is a plate (22) having an upper side and a lower side, each said side having a plurality of projections (24) thereon, said plate (22) extending across at least part of two horizontally-adjacent wall-building units (14) in said first course or in said second course, with said projections (24) on said upper side or said lower side protruding into said two horizontally-adjacent wall-building units.

14. A method according to claim 13 further including the step of placing a sheet of geogrid (18) extending from atop said first course into fill behind said retaining wall structure prior to placing said interconnecting members (26) on said first course, such that said first set of projections (24) protrudes through holes (28) in said geogrid sheet (18) and into said wall-building units (18) of said first course or further including the step of placing a sheet of geogrid (18) on top of said interconnecting members (26) extending from atop said first course into fill behind said retaining wall structure prior to placing said second plurality of wall-building units (14) to form said second course, such that said projections (24) protrude through holes (28) in said geogrid sheet (18) and into said wall-building units (14) of said second course.

15. A method according to claim 13 wherein said interconnecting member (60, 80, 90, 95, 100, 102, 110, 112, 114) further comprises a set of geogrid-holding members (66, 94, 104) on said upper side of said plate shaped and adapted to protrude through holes (28), in a sheet of geogrid (18), and said method further comprises the step of affixing a sheet of geogrid (18) to said interconnecting member extending into fill behind said retaining wall structure.

16. A method of according to claim 13 wherein said wall-building unit (14) is a sand/soil bag or wherein said wall building unit (14) is a hardenable building unit.

17. A method according to claim 16 further comprising the step of allowing or causing said hardenable building units (14) to harden.

18. A method according to claim 13 further comprising the step of affixing cover plate assemblies (30) to said retaining wall structure to form a substantially continuous cover for the face of said retaining wall structure.

Patentansprüche

1. Verbindungsmittel (26) zum Befestigen einer ersten sich horizontal erstreckenden Reihe von Wandbaueinheiten (14) an einer zweiten sich horizontal erstreckenden Reihe von Wandbaueinheiten, die vertikal anschließend zur ersten Reihe angeordnet ist, wobei das Verbindungsmittel einen Körper (22) mit Vorsprüngen (24) umfasst, die geeignet sind, in die Wandbaueinheiten in der ersten Reihe und in der zweiten Reihe zu ragen, **dadurch gekennzeichnet, dass** der Körper eine Platte (22) ist, die eine Oberseite und eine Unterseite aufweist, wobei jede Seite eine Vielzahl der Vorsprünge (24) auf ihr aufweist und die Platte geeignet ist, sich quer zumindest über Teilbereiche von zwei horizontal benachbarten Wandbaueinheiten (14) in der ersten Reihe oder der zweiten Reihe zu erstrecken, wobei die Vorsprünge (24) auf der Oberseite oder der Unterseite angeordnet sind, um in beide horizontal benachbarten Wandbaueinheiten zu ragen.

2. Verbindungsmittel (60, 80, 90, 95, 100, 102, 110, 112, 114) nach Anspruch 1, welches darüber hinaus einen Satz Geonetz-(Geogrid-)Haltemittel (66, 94, 104) auf der Oberseite der Platte umfasst, die geformt und angepasst sind, um durch Löcher (28) in einer Bahn eines Geogrids (18) zu ragen.

3. Verbindungsmittel (60, 80, 90) nach Anspruch 2, welches darüber hinaus eine an dem Geogrid-Haltemittel (66) befestigte Haltekappe (67) zum Halten einer Bahn eines Geogrids (18) auf diesem umfasst.

4. Verbindungsmittel (110, 112, 114) nach Anspruch 2, wobei das Geogrid-Haltemittel ein konischer Pfosten (104) mit einer breiteren Spitze als seine Basis ist oder wobei das Geogrid-Haltemittel (94) im wesentlichen L-förmig mit einem im wesentlichen horizontalen Teil (98) ist, welches sich in Richtung der Vorsprünge (64) erstreckt.

5. Verbindungsmittel nach Anspruch 2, welches darüber hinaus Drainagelöcher in dem Teil der Platte zwischen den Geogrid-Haltemitteln (66, 94, 104) und den hierzu nächstliegenden Vorsprüngen (64) enthält.

6. Verbindungsmittel nach Anspruch 1, welches darüber hinaus einen Flansch (70) um die Basis der Vorsprünge auf der Oberseite der Platte (62) um-

fasst, wobei der Flansch eine Lippe (72) zum Abdichten gegenüber eine Wandbaueinheit (14) aufweist und die Lippe (72) des Flansches optional zwei oder mehr konzentrische Dichtrippen (76) aufweist.

7. Verbindungsmittel nach Anspruch 1, wobei die Platte (22) rechtwinklig oder wobei die Platte (122) im wesentlichen C-förmig oder wobei die Platte hemizylindrisch oder wobei die Platte trapezförmig mit einer zentralen Ausnehmung (52) oder wobei die Platte im wesentlichen L-förmig ausgebildet ist.

8. Stützmauerstruktur, umfassend eine erste Vielzahl von Wandbaueinheiten (14), die aneinander angrenzend unter Ausbildung einer ersten sich horizontal erstreckenden Reihe angeordnet sind und eine zweite Vielzahl von Wandbaueinheiten, die aneinander angrenzend über der ersten Reihe unter Ausbildung einer zweiten sich horizontal erstrekkenden Reihe angeordnet sind, sowie Verbindungsmittel (26) zwischen der ersten Reihe und der zweiten Reihe, wobei die Verbindungsmittel einen Körper (22) mit Vorsprüngen (24) umfassen, die geeignet sind, in die Wandbaueinheiten in der ersten Reihe und in der zweiten Reihe zu ragen, **dadurch gekennzeichnet, dass** der Körper eine Platte (22) mit einer Oberseite und einer Unterseite ist, wobei jede Seite eine Vielzahl von Vorsprüngen (24) auf ihr aufweist und die Platte sich zumindest teilweise über zwei horizontal aneinander angrenzende Wandbaueinheiten (14) in der ersten Reihe oder der zweiten Reihe erstreckt, wobei die Vorsprünge (24) auf der Oberseite oder der Unterseite angeordnet sind, um in die beiden horizontal aneinander angrenzenden Wandbaueinheiten (14) zu ragen.

9. Stützmauerstruktur nach Anspruch 8, die darüber hinaus eine Bahn eines Geogrids (18) umfasst, welches sich von zwischen der ersten und zweiten Reihe in eine Auffüllung hinter der Stützmauerstruktur erstreckt, wobei die Geogrid-Bahn (18) eine Vielzahl von Löchern (28) in dieser aufweist und die Geogrid-Bahn so angeordnet ist, dass die Vorsprünge (24) des ersten oder zweiten Satzes durch die Löcher (28) der Geogrid-Sheet (18) hindurch ragen.

10. Stützmauerstruktur nach Anspruch 8, wobei das Verbindungsmittel (60, 80, 90, 95, 100, 102, 110, 112, 114) darüber hinaus einen Satz von Geogrid-Haltemitteln (66, 94, 104) auf der Oberseite der Platte aufweist, die geformt und angepasst sind, um durch die Löcher (28) in einer Bahn des Geogrids (18) zu ragen und wobei die Stützmauerstruktur darüber hinaus eine Bahn eines Geogrids (18) umfasst, welches sich von zwischen der ersten und zweiten Reihe in eine Auffüllung hinter der Stützmauerstruktur erstreckt, wobei die Geogrid-Bahn eine Vielzahl von Löchern (28) in dieser aufweist und die Geogrid-Bahn (18) so positioniert ist, dass die Geogrid-Haltemittel (66, 94, 104) durch die Löcher (28) der Geogrid-Bahn (18) ragen.

11. Stützmauerstruktur nach Anspruch 10, wobei die zweite Reihe der Wandbaueinheiten (14) die Geogrid-Haltemittel (66, 94, 104) abdeckt.

12. Stützmauerstruktur nach Anspruch 8, wobei die Wandbaueinheit (14) ein Sand/Erdreich-Sack ist, welcher optional eine transparente Abdeckung und eine dekorativ gefärbte Füllung aufweist, wobei der Sand/Erdreich-Sack optional Bodenbedeckungssamen enthält oder wobei optional die Wandbaueinheit (14) eine härtbare Baueinheit ist.

13. Verfahren zum Erstellen einer Stützmauerstruktur mit einer Vielzahl von Reihen aus Wandbaueinheiten (14), umfassend die Schritte des Platzierens einer ersten Vielzahl von Wandbaueinheiten (14) benachbart zueinander, um eine erste sich horizontal erstreckende Reihe auszubilden, Aufbringen von Verbindungsmitteln (26) auf der ersten Reihe, wobei die Verbindungsmittel einen Körper (22) mit Vorsprüngen (24) umfassen, die geeignet sind, in die Wandbaueinheiten (14) in vertikal benachbarten Reihen zu ragen und Aufbringen einer zweiten Vielzahl von aneinander angrenzenden Wandbaueinheiten (14), um eine zweite sich horizontal erstrekkende Reihe über der ersten Reihe in der Weise auszubilden, dass die Vorsprünge (24) in die Wandbaueinheiten (14) der zweiten Reihe ragen, **dadurch gekennzeichnet, dass** der Körper eine Platte (22) mit einer Oberseite und einer Unterseite ist, wobei jede Seite eine Vielzahl von Vorsprüngen (24) auf ihr aufweist und die Platte sich zumindest zum Teil über zwei horizontal aneinander angrenzende Wandbaueinheiten (14) in der ersten Reihe oder der zweiten Reihe erstreckt, wobei die Vorsprünge (24) auf der Oberseite oder Unterseite in die beiden horizontal aneinander angrenzenden Wandbaueinheiten ragen.

14. Verfahren nach Anspruch 13, welches darüber hinaus den Schritt des Anordnens einer Bahn eines Geogrids (18) beinhaltet, welches sich von oberhalb der ersten Reihe in eine Auffüllung hinter der Stützmauerstruktur erstreckt, bevor die Verbindungsmittel (26) auf die erste Reihe aufgebracht werden, so dass der erste Satz an Vorsprüngen (24) durch Löcher (28) in der Geogrid-Bahn (18) in die Wandbaueinheiten (18) der ersten Reihe ragen oder welches darüber hinaus den Schritt des Aufbringens einer Bahn eines Geogrids (18) auf der Oberseite der Verbindungsmittel (26) beinhaltet, welches sich von oberseitig der ersten Reihe in eine

Auffüllung hinter der Stützmauerstruktur erstreckt, bevor die zweite Vielzahl von Wandbaueinheiten (14) zur Ausbildung der zweiten Reihe aufgebracht wird, so dass die Vorsprünge (24) durch Löcher (28) in der Geogrid-Bahn (18) und in die Wandbaueinheiten (14) der zweiten Reihe ragen.

15. Verfahren nach Anspruch 13, wobei das Verbindungsmittel (60, 80, 90, 95, 100, 102, 110, 112, 114) darüber hinaus einen Satz von Geogrid-Haltemitteln (66, 94, 104) auf der Oberseite der Platte umfasst, die geformt und angepasst sind, um durch Löcher (28) in einer Bahn eines Geogrids (18) zu ragen, und wobei das Verfahren darüber hinaus den Schritt des Befestigens einer sich in eine Auffüllung hinter der Stützmauerstruktur erstreckenden Bahn eines Geogrids (18) an dem Verbindungsmittel umfasst.

16. Verfahren nach Anspruch 13, wobei die Wandbaueinheit (14) ein Sand/Erdreich-Sack ist oder wobei das die Wandbaueinheit (14) eine härtbare Baueinheit ist.

17. Verfahren nach Anspruch 16, welches darüber hinaus den Schritt des Ermöglichen oder Hervorrufens des Härtens der härtbaren Baueinheiten (14) umfasst.

18. Verfahren nach Anspruch 13, welches darüber hinaus den Schritt des Befestigens von Abdeckplattenkomponenten (30) auf die Stützmauerstruktur umfasst, um eine im wesentlichen kontinuierliche Abdeckung für die Oberfläche der Stützmauerstruktur auszubilden.

Revendications

1. Membre d'interconnexion (26) pour attacher une première assise s'étendant horizontalement d'une unité de construction (14) à une deuxième assise s'étendant horizontalement de l'unité de construction positionnée verticalement de manière adjacente à ladite première assise, ledit membre d'interconnexion comprenant un corps (22) avec des saillies (24) aptes à s'étendre dans ladite unité de construction de ladite première assise et dans ladite deuxième assise, **caractérisé en ce que** ledit corps forme une plaque (22) possédant une face supérieure et une face inférieure, chacune de ces faces comportant dessus une pluralité desdites saillies (24), ladite plaque étant apte de s'étendre au travers d'au moins une partie de deux unités de construction (14) horizontalement adjacentes dans ladite première assise ou dans ladite deuxième assise, avec lesdites saillies (24) sur ladite face supérieure ou sur ladite face inférieure positionnées de manière à s'étendre dans lesdites deux unités de construction horizontalement adjacentes.

2. Membre d'interconnexion (60,80,90,95,100,102,110,112,114) selon la revendication 1, comprenant en outre un jeu de membres de géogrilles de maintien (66,94,104) sur ladite face supérieure de ladite plaque formée et qui est adapté pour s'étendre au travers de trous (28) dans une feuille de géogrille (18).

3. Membre d'interconnexion (60,80,90) selon la revendication 2, comprenant en outre une coiffe de retenue (67) apposée sur ledit membre de géogrille de maintien (66) pour retenir la feuille de géogrille (18) dessus.

4. Membre d'interconnexion (110,112,114) selon la revendication 2, dans lequel ledit membre de géogrille de maintien forme un montant tronconique (104) possédant une partie haute (108) plus large que sa partie basse (109) ou dans lequel ledit membre de géogrille de maintien (94) est généralement de forme en L, comportant une partie (98) généralement horizontale s'étendant vers lesdites saillies (64).

5. Membre d'interconnexion selon la revendication 2, comprenant en outre des trous de drainage dans la partie de ladite plaque entre lesdits membres de géogrille de maintien (66,94,104) et lesdites saillies (64) les plus proches dessus.

6. Membre d'interconnexion selon la revendication 1 comprenant en outre une collerette d'encastrement (70) autour de la base desdites saillies sur ladite face supérieure de ladite plaque (62), ladite collerette possédant une lèvre (72) pour se sceller contre une unité de construction (14), ladite lèvre (72) de ladite collerette possédant deux ou plus anneaux de scellage concentriques (76).

7. Membre d'interconnexion selon la revendication 1, dans lequel ladite plaque (22) est rectangulaire ou dans lequel ladite plaque (122) est de forme générale en C ou dans lequel ladite plaque est hémi-cylindrique ou dans lequel la plaque est trapézoïdale avec un découpage central (52) ou dans lequel ladite plaque est de forme générale en L.

8. Structure de mur de soutènement comprenant une première pluralité d'unités de construction (14) positionnée de manière adjacente à un autre formant une première assise s'étendant horizontalement, une deuxième pluralité d'unités de construction positionné adjacente à un autre au dessus de ladite première assise formant une deuxième deuxième assise s'étendant horizontalement, et les membres

d'interconnexion (26) entre ladite première assise et ladite deuxième assise, lesdits membres d'interconnexion comprenant un corps (22) muni de saillies (24) aptes à s'étendre dans lesdites unités de construction dans ladite première assise et dans ladite deuxième assise, **caractérisé en ce que** ledit corps forme une plaque (22) comportant une face supérieure et une face inférieure, chacune de ces faces comportant une pluralité de saillies (24) dessus, ladite plaque s'étendant en travers au moins une partie de deux unités de construction (14) horizontalement adjacentes dans ladite première assise ou ladite deuxième assise, avec lesdites saillies (24) sur ladite face supérieure ou ladite face inférieure positionnées de manière à dépasser dans lesdites deux unités de construction (14) horizontalement adjacentes.

9. Structure de mur de soutènement selon la revendication 8, comprenant en outre une feuille de géogrille (18) s'étendant d'entre lesdites première et deuxième assises dans le remblai derrière ladite structure de mur de soutènement, ladite feuille de géogrillle (18) comportant une pluralité de trous (28) dedans, et ladite feuille de géogrille étant positionnée de telle manière que lesdites saillies (24) du premier et du deuxième jeu dépassent au travers desdits trous (28) de ladite feuille de géogrille (18).

10. Structure de mur de soutènement selon la revendication 8, dans laquelle ledit membre d'interconnexion (60,80,90,95,100,102,110,112,114) comprends en outre un jeu de membres de géogrille de maintien (66,94,104) sur la face supérieure de ladite plaque formée et adaptée pour dépasser au travers des trous (28à) dans la feuille de géogrillle (18) et dans laquelle ladite structure de mur de soutènement comprends en outre une feuille de géogrille (18) s'étendant d'entre ladite première et deuxième assise dans le remblai derrière ladite structure de mur de soutènement, ladite feuille de géogrillle comportant une pluralité de trous (28) dedans, et ladite feuille de géogrille (18) étant positionnée de telle manière que lesdits membres de géogrille de maintien (66,94,104) dépassent au travers desdits trous (28) de ladite feuille de géogrille (18).

11. Structure de mur de soutènement selon la revendication 10, dans laquelle ladite deuxième assise des unités de construction (14) couvre lesdits membres de géogrille de maintien (66,94,104).

12. Structure de mur de soutènement selon la revendication 8, dans laquelle ladite unité de construction (14) comporte un sac de sable/terre, comportant de manière optionnelle un couvercle transparent et un remblai coloré de manière décorative, le sac de sable/terre contenant de manière optionnelle des graines de sol ou dans laquelle ladite unité de construction (14) forme unité de construction qui se durcit.

13. Procédé de construction de structure de mur de soutènement comportant une pluralité d'assises d'unités de construction (14), comprenant les étapes de placer une première pluralité d'unités de constructions (14) adjacentes les unes aux autres pour former une première assise s'étendant horizontalement, placer les membres d'interconnexion (26) sur ladite première assise, lesdits membres d'interconnexion comprenant un corps (22) avec des saillies (24) aptes à s'étendre dans lesdites unités de construction (14) dans les assises adjacentes verticales, et placer une deuxième pluralités d'unité de construction (14) adjacente les unes aux autres pour former une deuxième assise s'étendant horizontalement au dessus de ladite première assise de sorte que lesdites saillies (24) s'étendent dans lesdites unités de construction (14) de ladite deuxième assise, **caractérisé en ce que** ledit corps forme une plaque (22) comporte une face supérieure et une face inférieure, chacune des faces comportant une pluralité de saillies (24) dessus, ladite plaque (22) s'étendant en travers d'au moins une partie de deux unités de construction (14) horizontalement adjacentes dans ladite première assise ou dans ladite deuxième assise, avec lesdites saillies (24) sur ladite face supérieure ou ladite face inférieure s'étendant dans lesdites deux unités de constructions horizontalement adjacentes.

14. Procédé selon la revendication 13 comprenant en outre une étape consistant à placer une feuille de géogrille (18) s'étendant à partir d'un haut de la dite première assise dans le remblai derrière ladite structure de mur de soutènement avant de placer les membres d'interconnexion (26) sur ladite première assise, de sorte que ledit premier jeu de saillies (24) s'étend au travers de trous (28) dans ladite feuille de géogrille (18) et dans lesdites unités de construction (18) de la dite première assise ou comprenant en outre l'étape consistant à placer une feuille de géogrille (18) sur le haut des membres d'interconnexion (26) s'étendant à partir du haut de la dite première assise dans le remblai derrière ladite structure de mur de soutènement avant de placer lesdites deuxième pluralité d'unités de construction (14) pour former la deuxième assise, de sorte que lesdites saillies (24) s'étendent au travers des trous (28) dans ladite feuille de géogrilles (18) et dans lesdites unités de construction (14) de la deuxième assise.

15. Procédé selon la revendication 13, dans laquelle ledit membre d'interconnexion (60,80,90,95,100,102,110,112,114) comprends en outre un jeu de membres de géogrille de maintien (66,94,104) sur ladite

face supérieure de ladite plaque formée et adaptée pour s'étendre au travers des trous (28), dans la feuille de géogrille (18), et ledit procédé comprends en outre une étape consistant à fixer une feuille de géogrille (18) audit membre d'interconnexion s'étendant dans le remblai derrière ladite structure de mur de soutènement.

16. Procédé selon la revendication 13, dans lequel ladite unité de construction (14) est un sac de sable/terre ou dans lequel ladite unité de construction (14) est une unité de construction apte à se durcir.

17. Procédé selon la revendication 16 comprenant en outre une étape consistant à permettre à l'unité de construction apte à se durcir de se durcir ou consistant à provoquer l'unité de construction (14) apte à se durcir de se durcir.

18. Procédé selon la revendication 13 comprenant en outre l'étape consistant à fixer une plaque d'assemblage de couverture (30) à ladite structure de mur de soutènement pour former un couvercle continu pour la face de ladite structure de mur de soutènement.

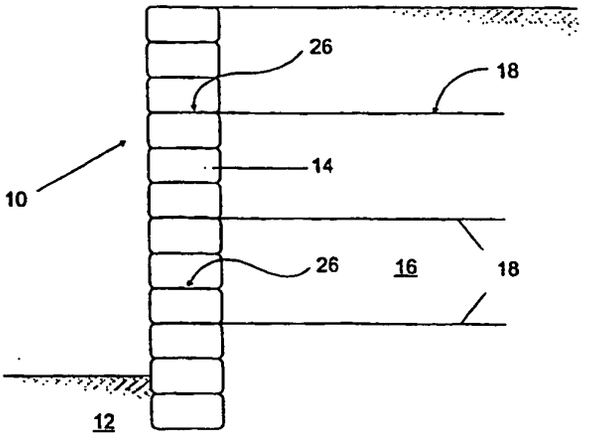


FIG. 1

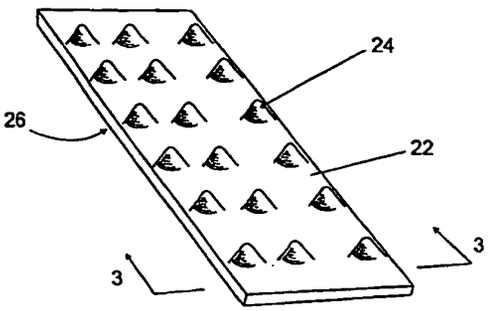


FIG. 2

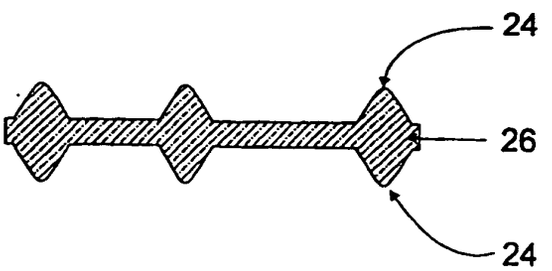


FIG. 3

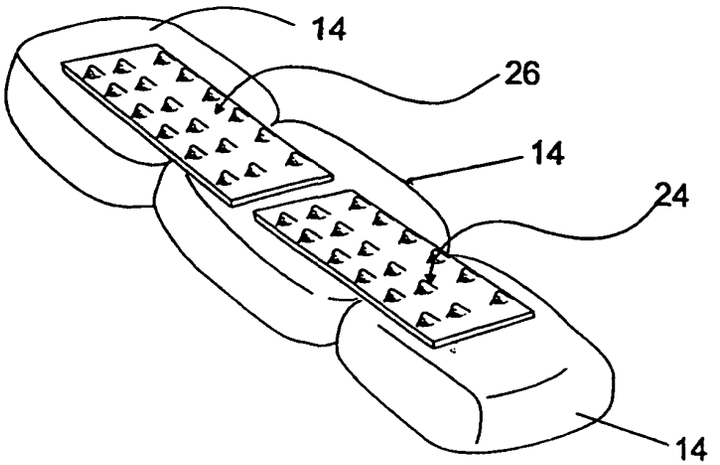


FIG. 4

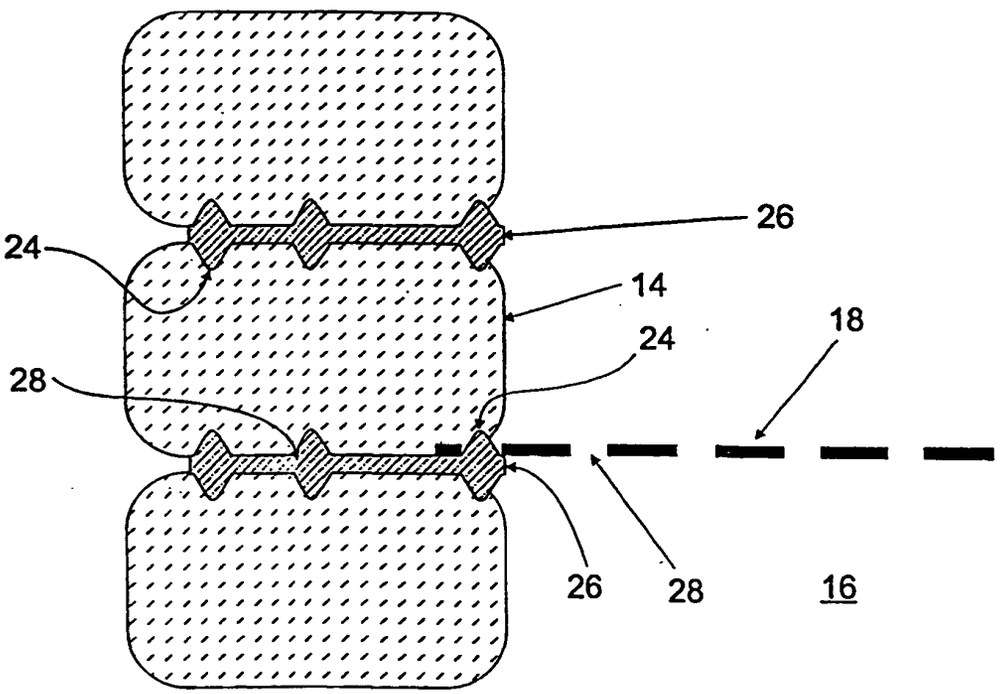


FIG. 5

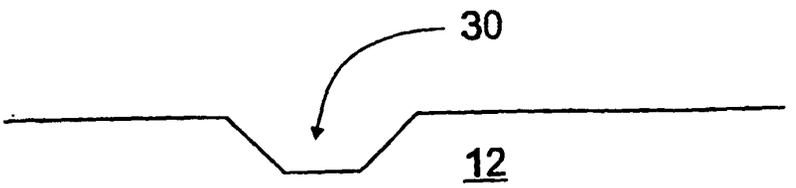


FIG. 6 (a)

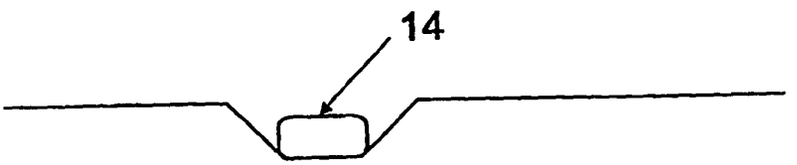


FIG. 6 (b)

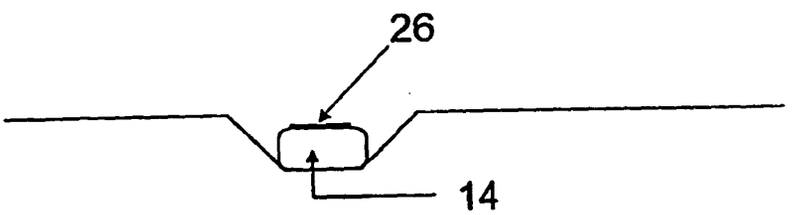


FIG. 6 (c)

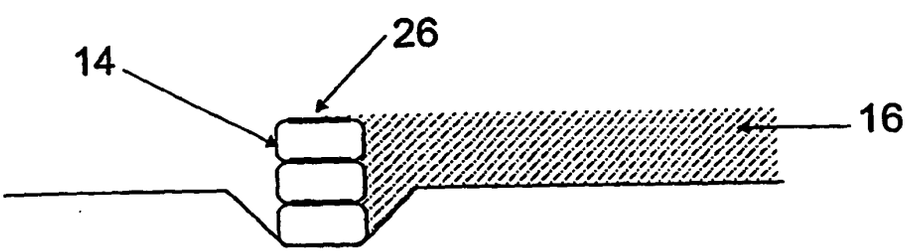


FIG. 6 (d)

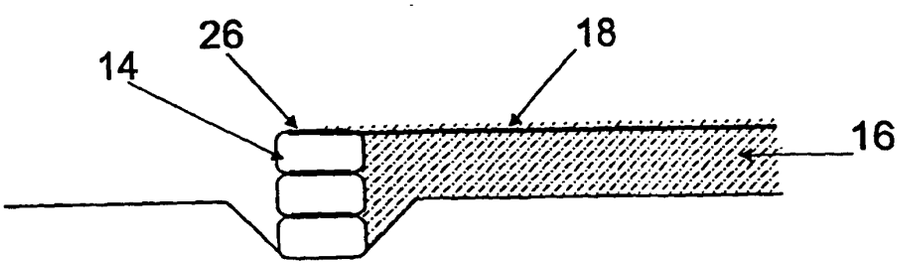


FIG. 6 (e)

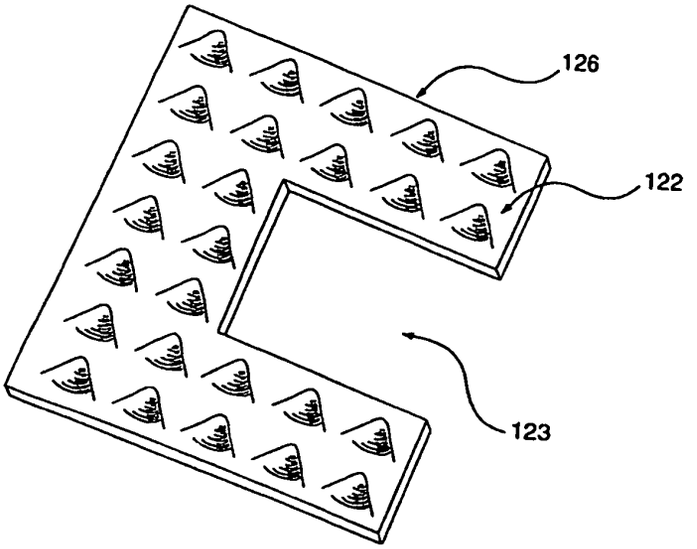


Fig. 7

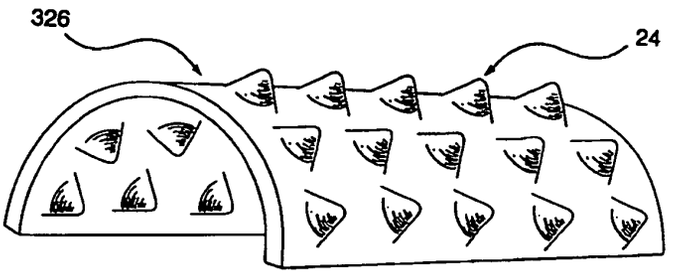


Fig. 8

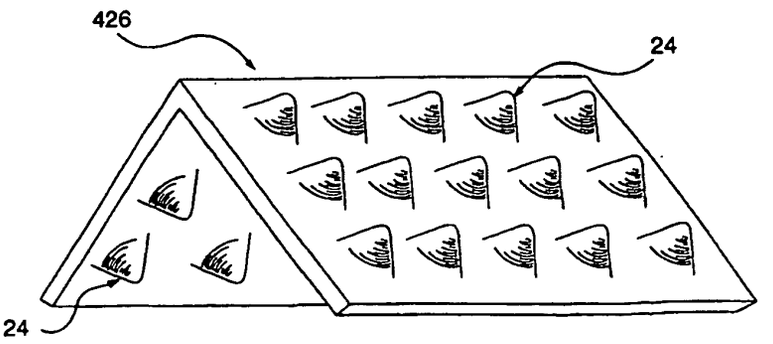


Fig. 9

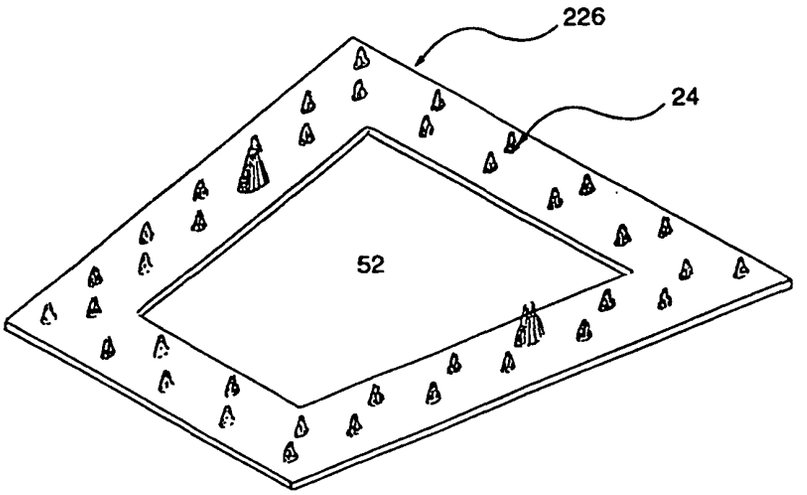


Fig. 10

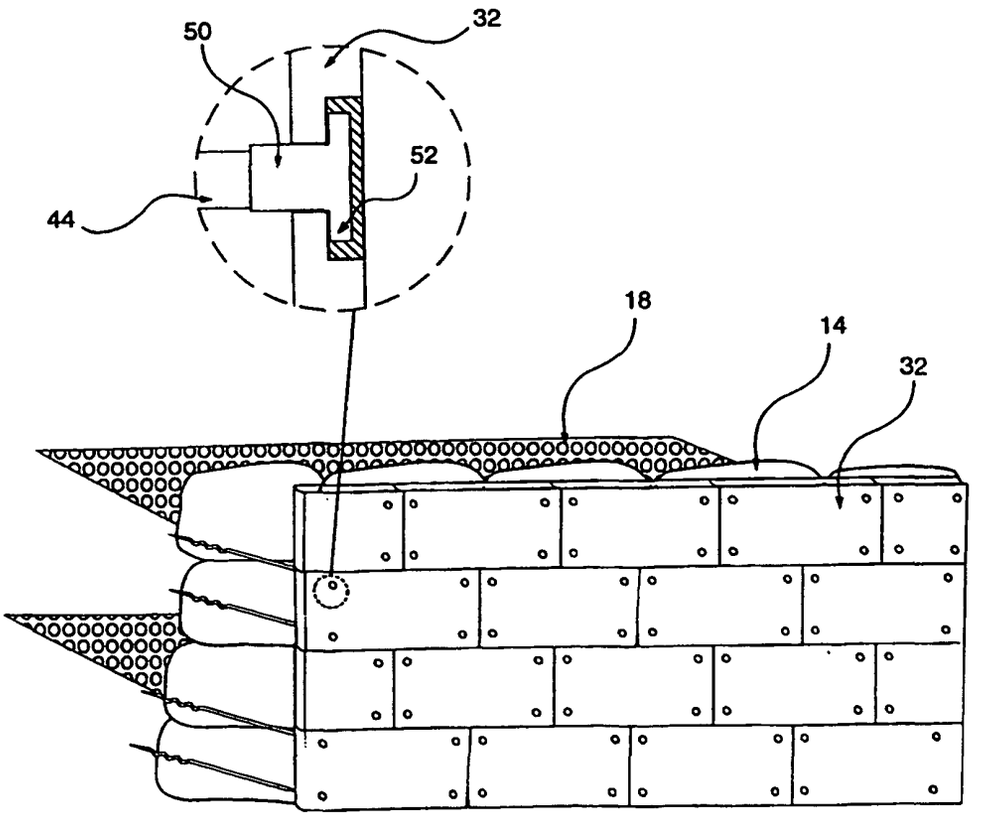


Fig. 12

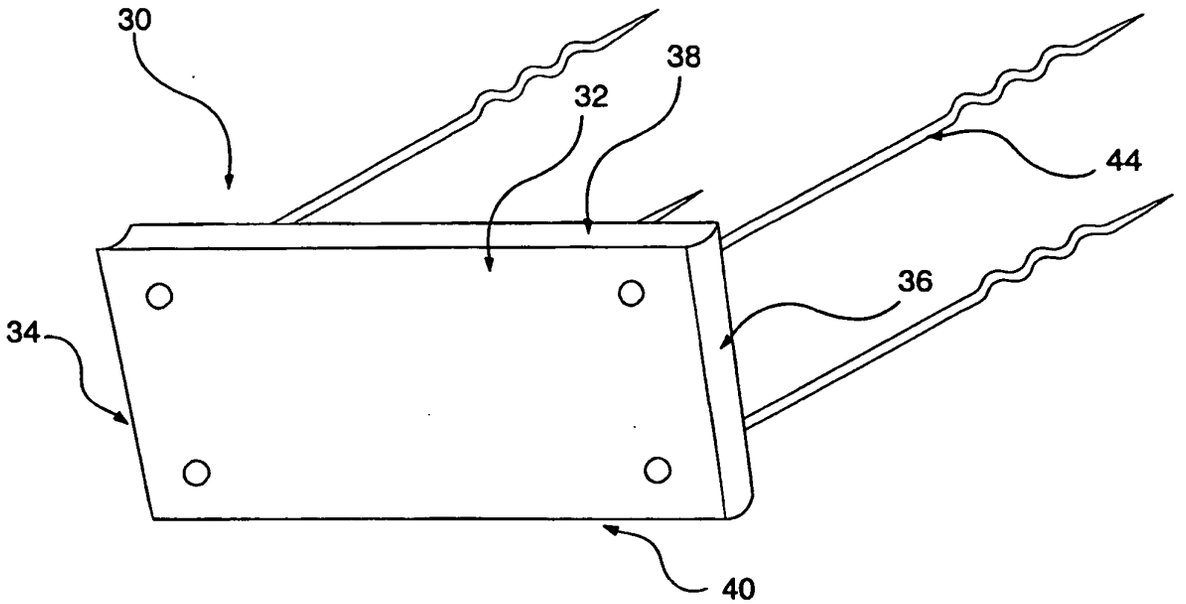


Fig. 11(a)

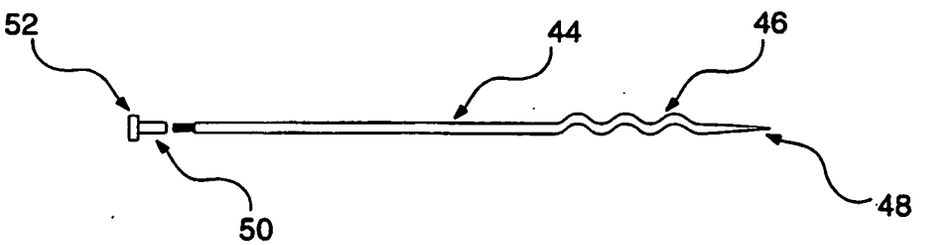


Fig. 11(b)

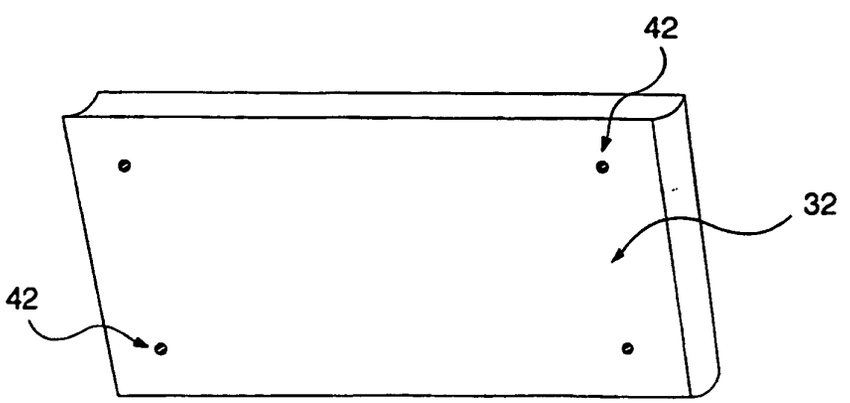


Fig. 11(c)

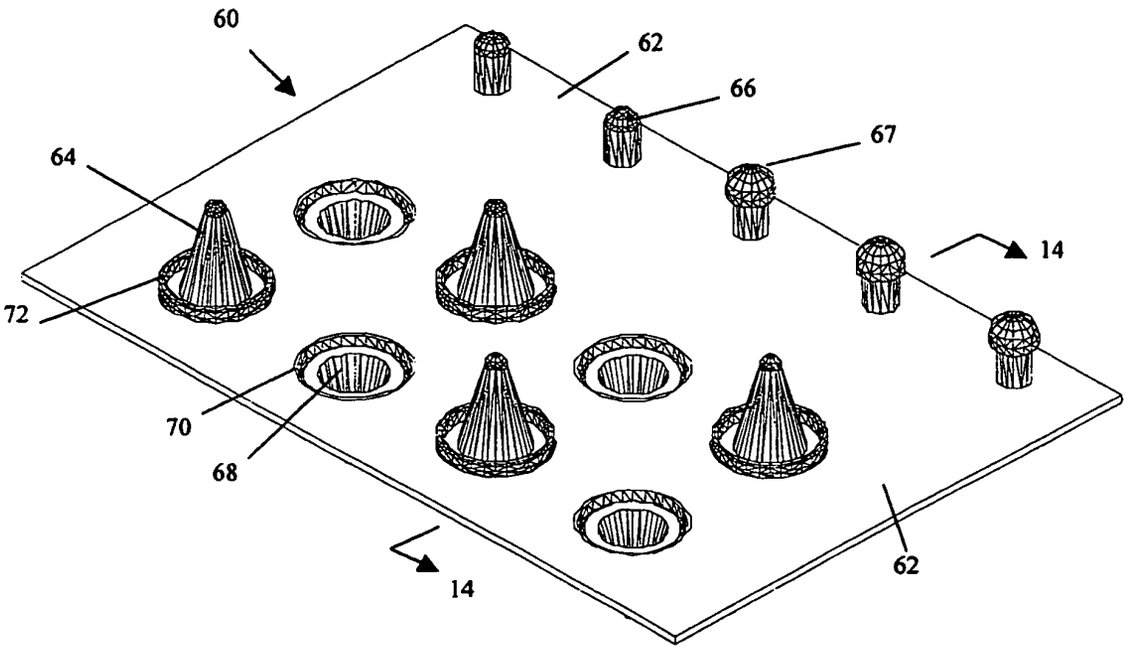


FIG. 13

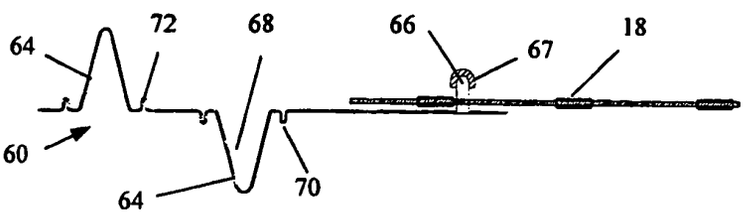


FIG. 14

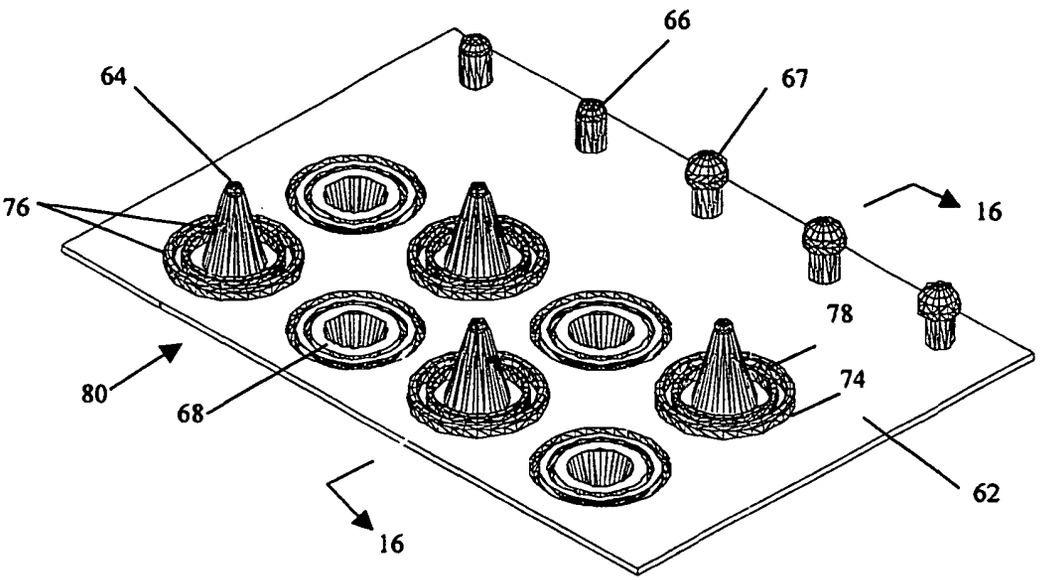


FIG. 15

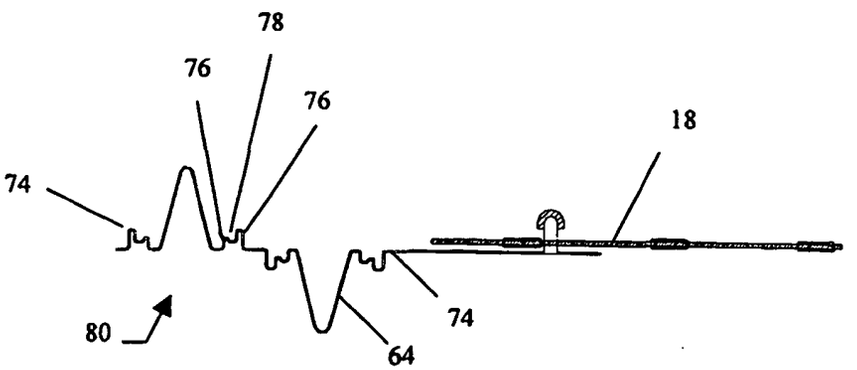


FIG. 16

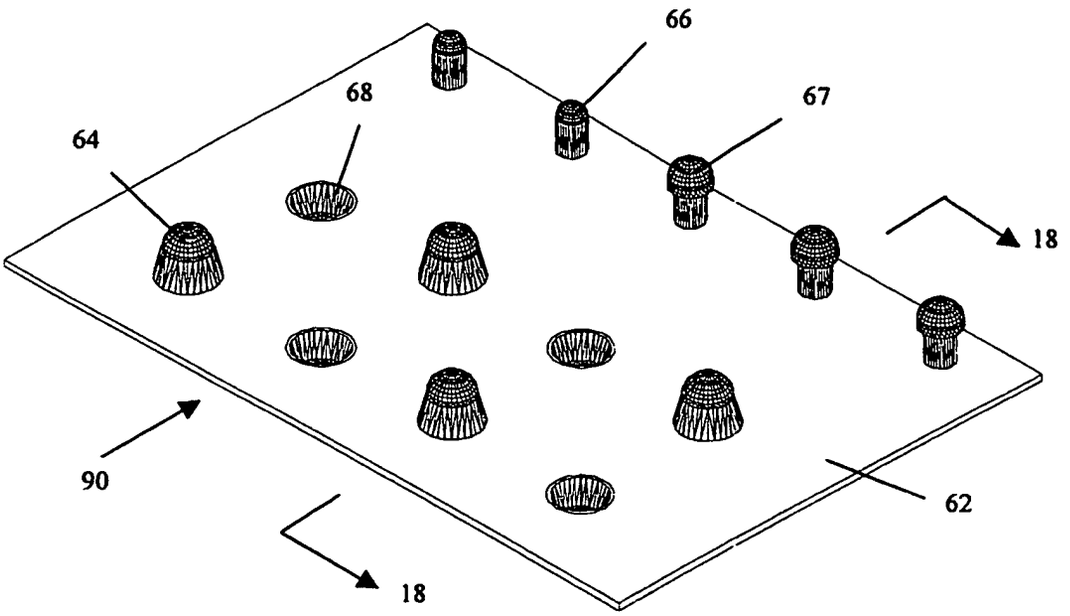


FIG. 17

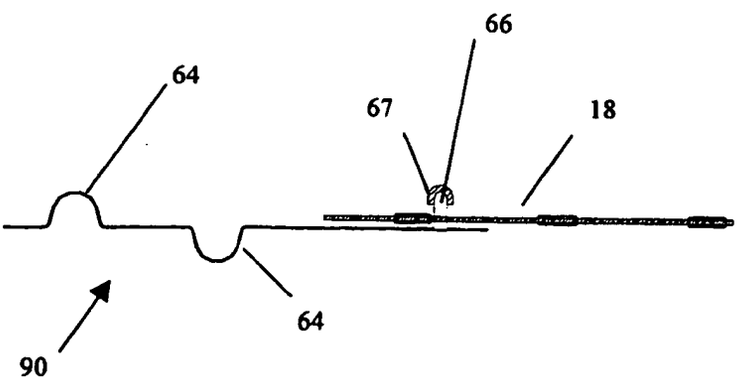


FIG. 16

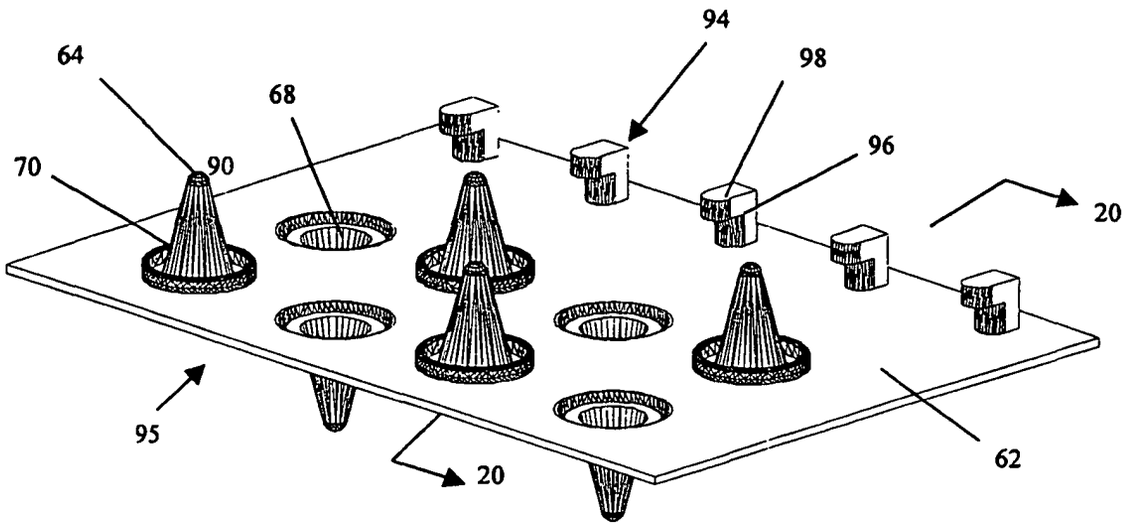


FIG. 19

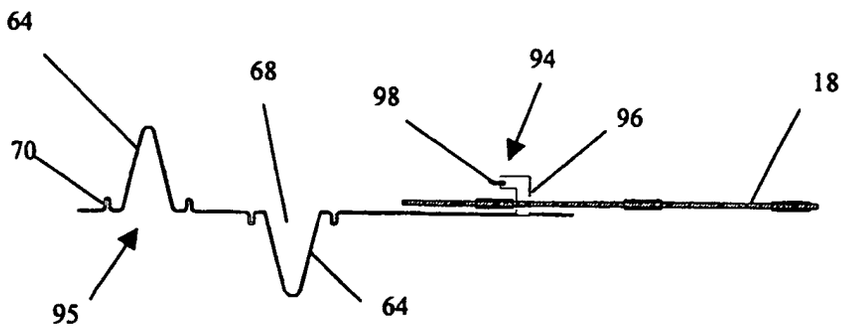


FIG. 20

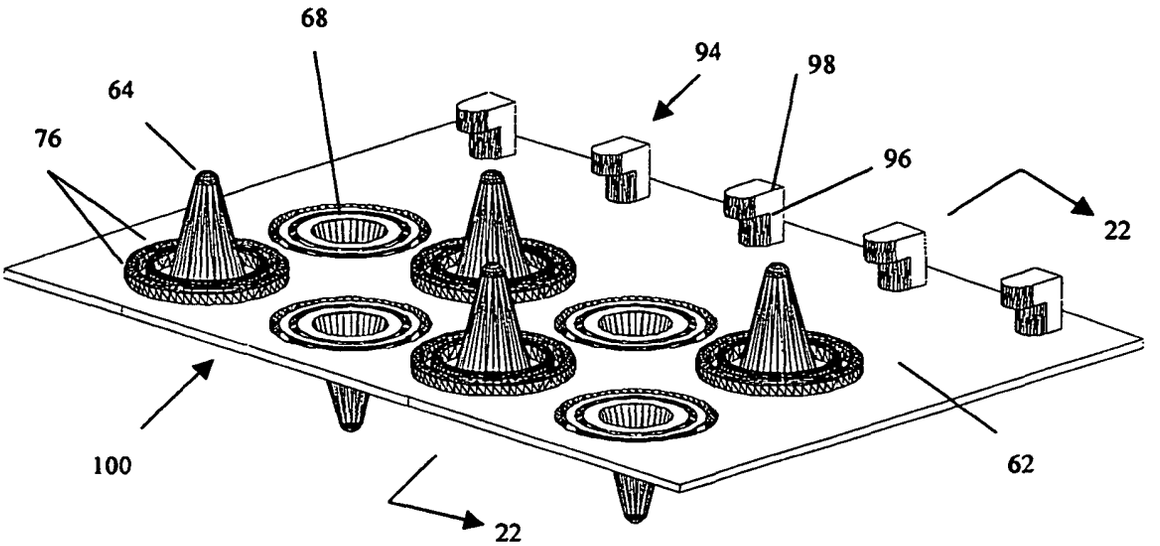


FIG. 21

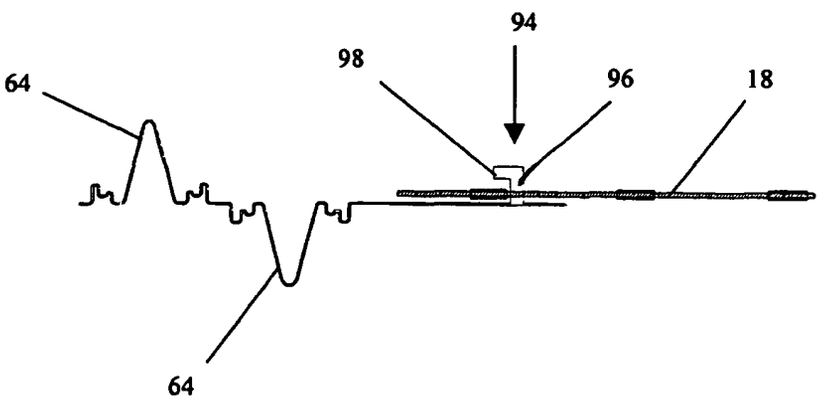


FIG. 22

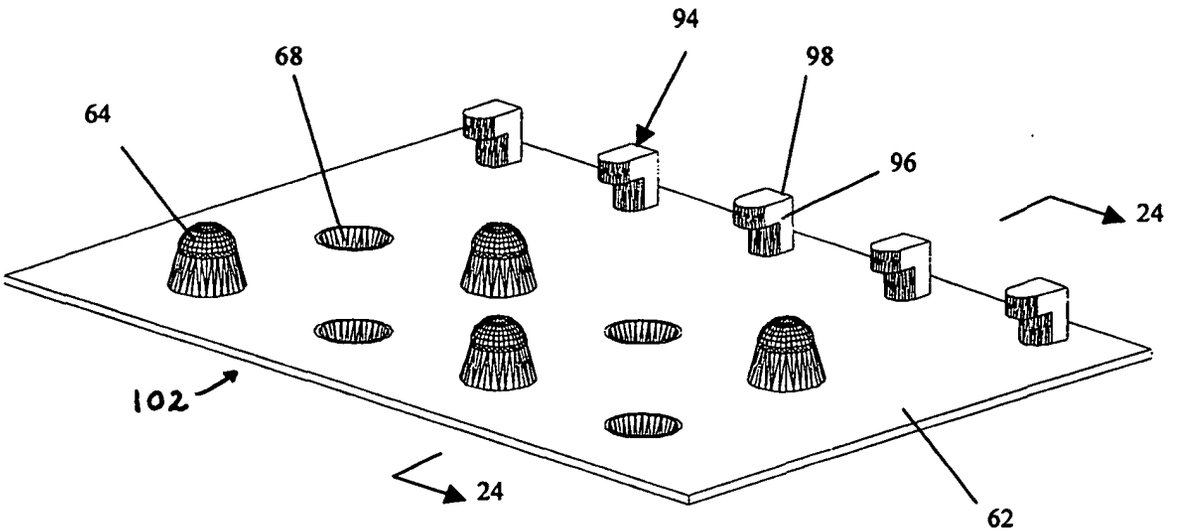


FIG. 23

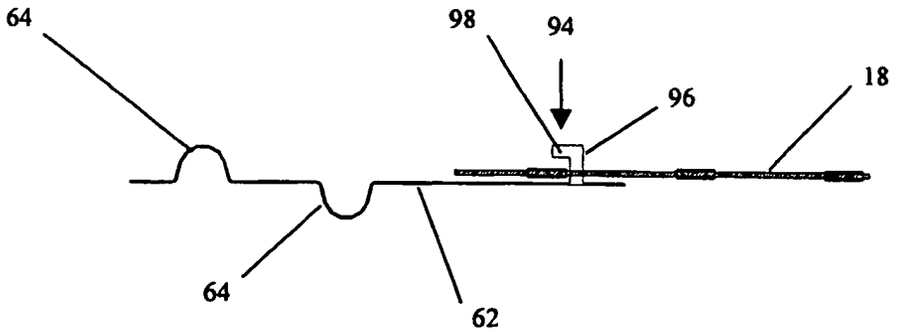


FIG. 24

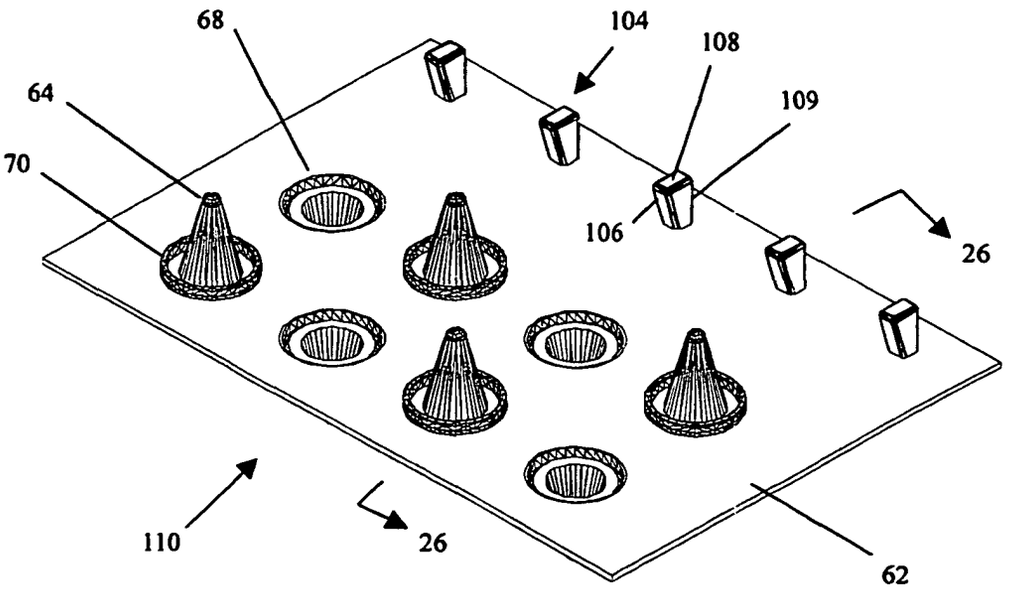

68
104
108
64
109
70
106
26
110
26
62

FIG. 25

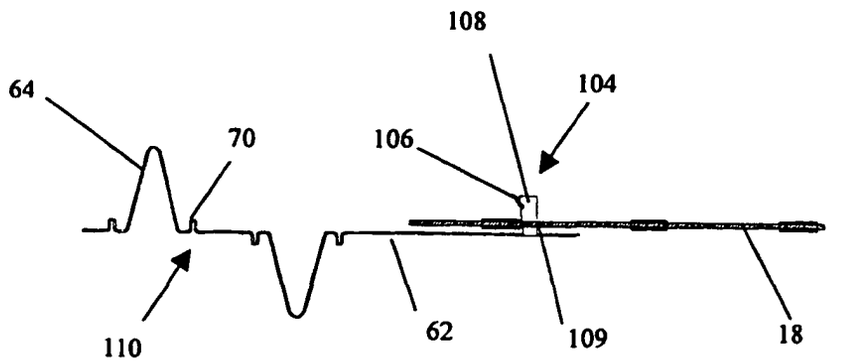

108
64
104
70
106
110
62
109
18

FIG. 26

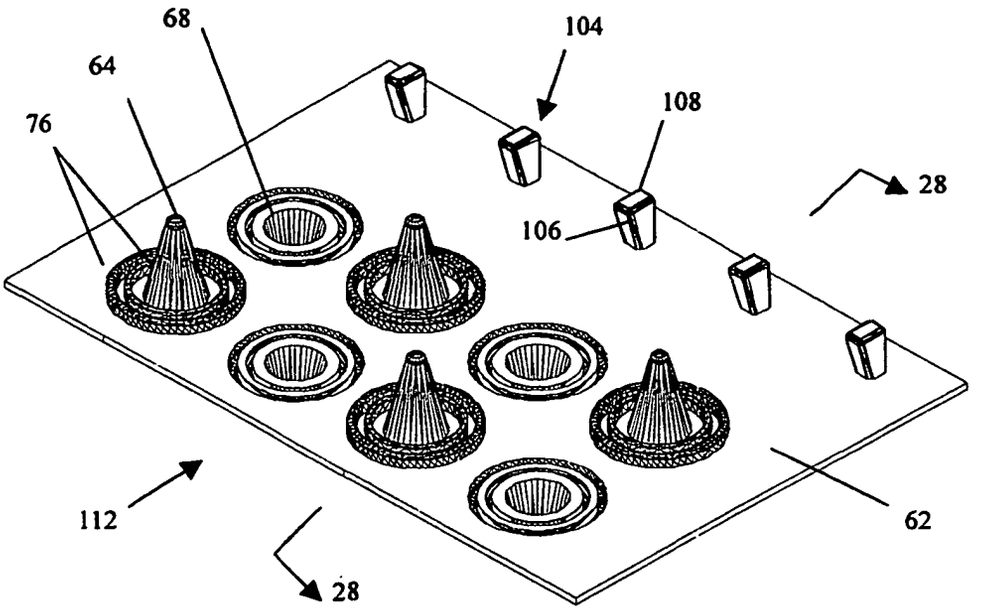


FIG. 27

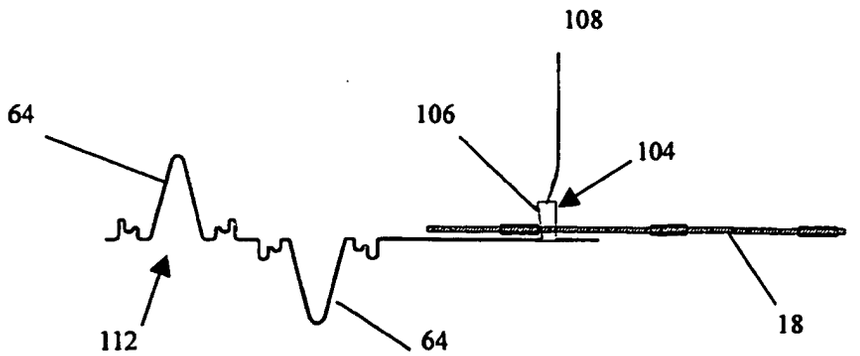


FIG. 28

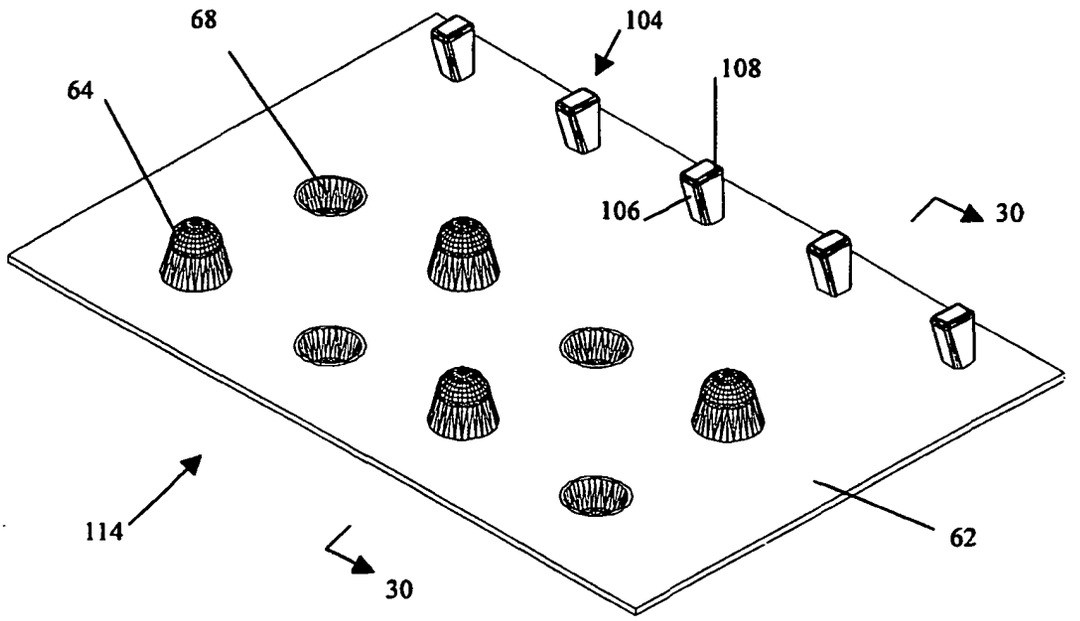


FIG. 29

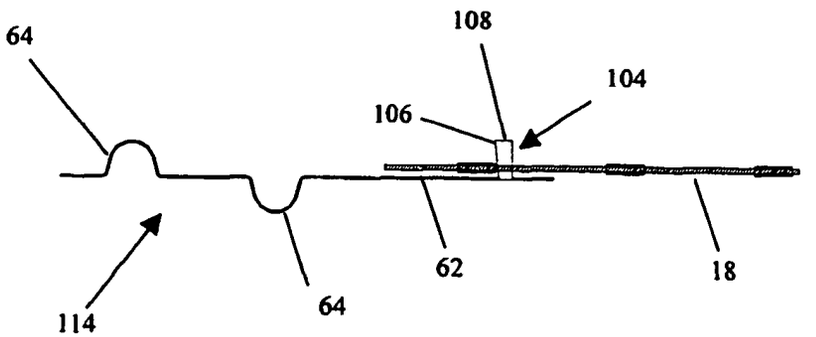


FIG. 30

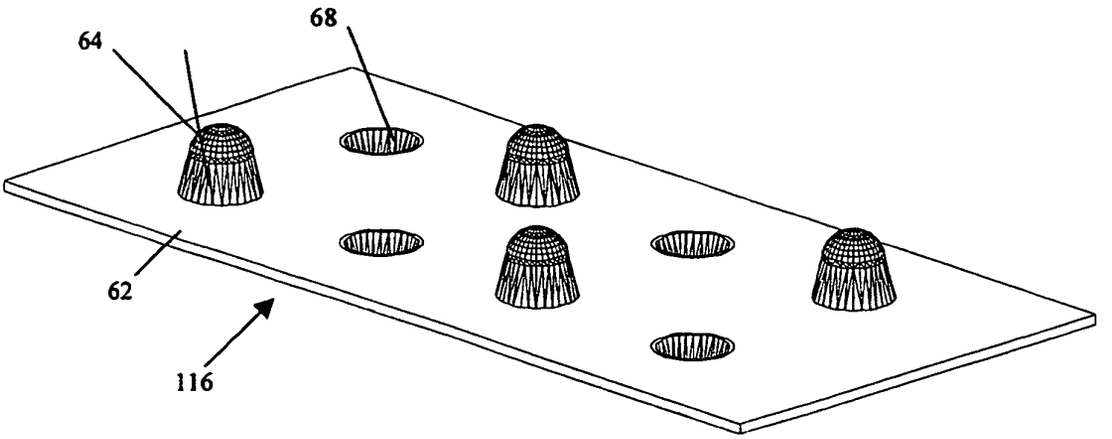
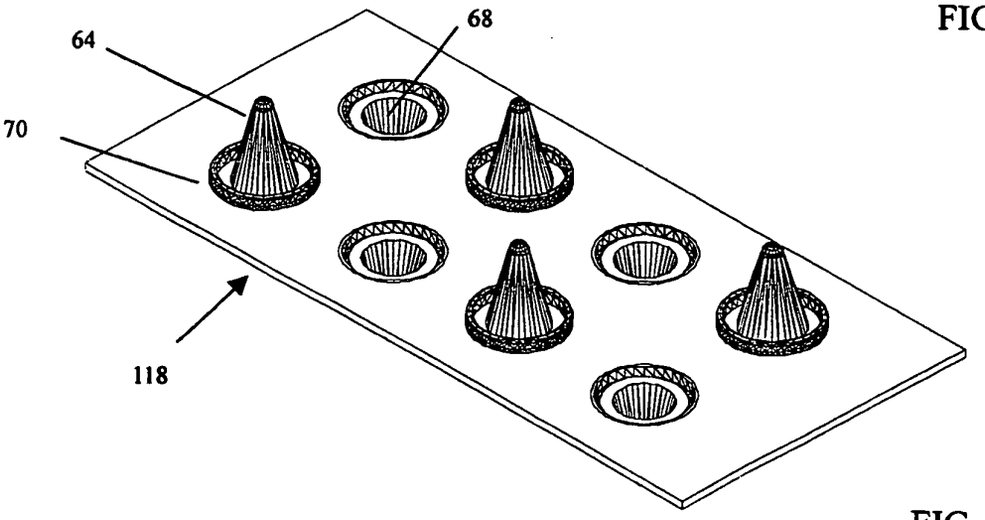


FIG. 31



64

FIG. 32

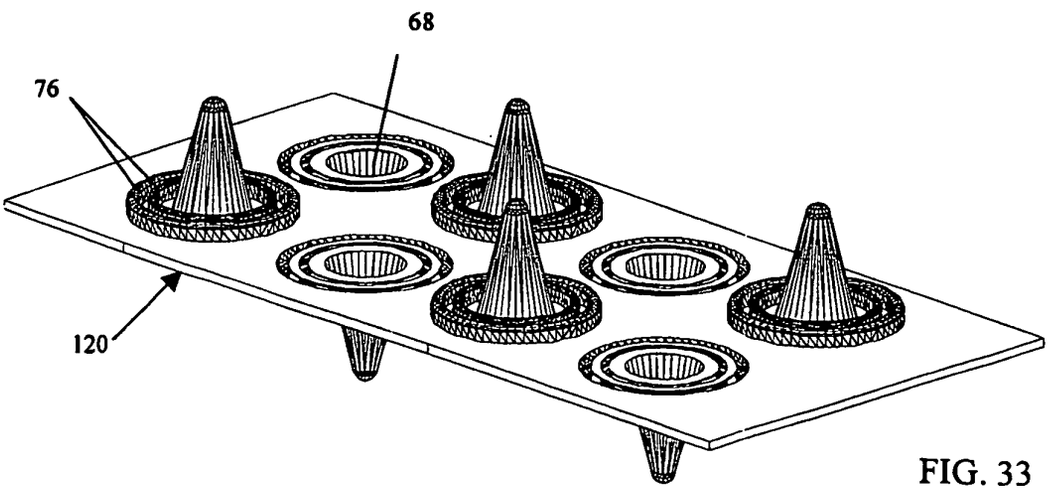


FIG. 33