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(54) Title: COMPOSITE TERMITE BARRIER

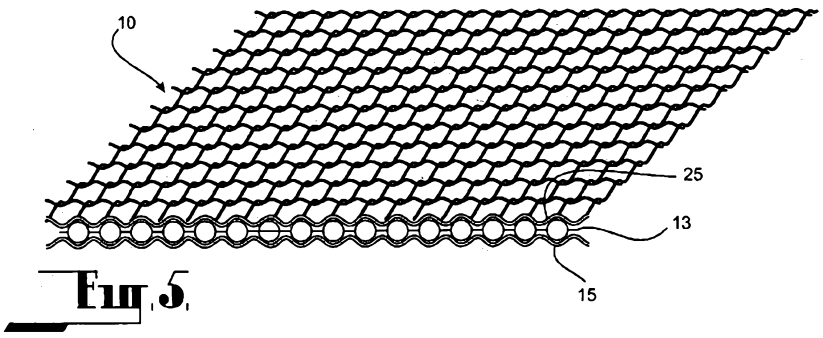


Fig. 5

(57) Abstract: A composite termite barrier (10) comprising a mesh sheet (13) and two membranes (15, 25) bonded to opposed sides of the mesh sheet to provide structural rigidity. In the arrangement illustrated, the mesh sheet (13) is woven wire mesh comprising strands 17 cooperating to define openings 19 in the mesh. The mesh sheet (13) functions as an active termite barrier; that is, the mesh sheet is configured to exclude the passage of termites therethrough, and the membranes (15, 25) provide support for the sheet to prevent it from distorting to an extent that it would no longer provide an effective barrier to termites.

Composite Termite Barrier

Field of the Invention

The present invention relates to pest control and more particularly to a composite pest barrier, and to protection of buildings and other structures from such pests.

While the pest barrier according to the invention has been devised particularly as a termite barrier, it can also function as a barrier for other pests, particularly crawling pests including spiders and insects such as ants.

Background Art

The following discussion of the background art is intended to facilitate an understanding of the present invention only. The discussion is not an acknowledgement or admission that any of the material referred to is or was part of the common general knowledge as at the priority date of the application.

There are various proposals for barriers to prevent or inhibit infestation of buildings and other structures by termites. Typically, the barriers comprise either chemical barriers or physical barriers.

Chemical barriers have been used for many years, although in recent times there has been a trend towards physical barriers, owing to health concerns arising from the use of certain chemicals to establish chemical barriers. Among other things, the concerns relate to the manner in which the chemicals are delivered for the purposes of establishing the chemical barrier, typically by way of pouring, spraying or injecting insecticides in doses sufficient to provide protection for an extended duration.

With a view to addressing concerns about the delivery of chemicals in the establishment of chemical barriers, there have been proposals for the chemicals to be incorporated into membranes and other arrangements which are laid into position, thereby avoiding the need for spraying, pouring or injecting chemicals. These are sometimes referred to as physical chemical barriers.

Physical barriers can be in various forms, including wire mesh and graded stone. Stainless steel wire mesh barriers have proved to be particularly effective, and any improvements are therefore keenly sought after.

As stainless steel is a commodity driven by the financial markets, an improvement based on the more efficient use stainless steel mesh material is desirable.

Typically, stainless steel termite barriers comprise woven wire mesh with wire strands of the order of 0.18 mm in diameter at spacings of less than 0.7 mm which are considered appropriate to provide mesh opening size sufficient for the mesh to exclude termites of the type to be controlled.

With a view to maximising the efficient use of the mesh functioning as the barrier, it is desirable to reduce the quantity of stainless steel employed in the mesh. This can be achieved in several ways, one being to reduce the diameter of the strands and another being to increase the spacing between the strands. Alternatively, or additionally, a wire material other than stainless steel may be used for the mesh. In such a case, the wire material need not be metal wire; it may be made of any other material or materials, including plastics materials.

A reduction in the quantity of stainless steel employed in the mesh, such as by reducing the diameter of the strands and/or increasing the spacing between the strands, may result in a mesh which is inferior in terms of resistance to distortion in the plane of the mesh; that is, the mesh may be "floppy" or have "sleaziness" (the latter term being used by certain persons practicing in the field of mesh termite barriers to describe this characteristic of mesh). The characteristic of sleaziness is evident when a mesh sheet is placed on a flat surface and two hands are placed in side-by-side spaced apart relation on the mesh and moved in parallel but opposing directions. The resultant distortion in the plane of the mesh can result in the mesh openings increasing in to an unacceptable extent. In particular, the distortion of the mesh in the plane of the mesh may cause the mesh openings therein to change size or configuration to an extent to no longer exclude termites of the type to be controlled.

Another improvement in the use of stainless steel mesh concerns the manner in which it is required to be installed in order to provide an effective termite barrier. Typically, the mesh is integrally secured to a structure, such as a concrete slab, a wall or other component of the structure. In certain applications of the barrier, the mesh is integrally secured by adhesion using a specific cementitious adhesive composition known as "parge". It would be advantageous to use now commonly available adhesives appropriate for use with termite barriers. This is particularly so for such adhesives capable of spray application.. However, it has been found that stainless steel mesh is not necessarily conducive for use with commonly available adhesives which are appropriate for use with termite barriers and which can be applied by spraying..

It is against this background and the problems and difficulties associated therewith, that the present invention has been developed.

Disclosure of the Invention

According to a first aspect of the invention there is provided a composite pest barrier comprising mesh sheeting adapted to prevent the passage of target pests therethrough and means associated with the mesh sheeting to resist distortion of the mesh in a manner which would cause one or more mesh openings therein to change in size or configuration to permit the passage of target pests through the mesh.

Where the pest barrier is intended as a termite barrier, the target pests would comprise termites, from a species of termites intended to be controlled by the termite barrier.

Typically, the mesh would comprise mesh openings of a size dimensioned to prevent the passage of the head of the termite therethrough. Specifically, the openings have a linear dimension in any direction less than the maximum linear dimension of the cross-section of the head of the species of termite to be controlled.

The mesh sheeting may be of any appropriate form. The mesh sheeting is preferably woven mesh, although is can conveniently also comprise sheeting in which perforations are made after formation of the sheet material.

Preferably the mesh sheeting is formed of a material which is resistant to breakdown in the environment of use, which is substantially resistant to termite secretions and which is also substantially resistant to termite chewing. Such material preferably has a hardness of at least Shore D60, and more preferably a hardness of at least Shore D70,and in certain applications desirably a hardness of at least Shore D80.

The mesh sheeting is preferably woven mesh, as alluded to above. The woven mesh may comprise warp strands and weft strands in any appropriate type of weave.

Where the mesh sheeting comprises woven mesh, the distortion may comprise displacement between the warp and weft strands at points of intersection therebetween causing the adjacent mesh openings to change in size or configuration.

Preferably, said means associated with the mesh sheeting to resist distortion of the mesh in the manner described is adapted to constrain the warp strands and weft strands from displacement with respect to each other at points of intersection therebetween. The constraint against displacement prevents adjacent strands shifting laterally to an extent which would increase the size of the respective mesh openings to no longer be capable of excluding termites of the type to be controlled. The constraint may be such that the warp stands and weft strands are fixed against displacement with respect to each other at points of intersection therebetween. Alternatively, the constraint may be such that some lateral displacement can occur, but not to an extent which would be detrimental to the exclusion of termites of the type to be controlled. Further, the constraint may permit some angular movement between the warp strands and weft strands at points of intersection therebetween.

Preferably, said means associated with the mesh sheeting to resist distortion of the mesh in the manner described may comprise a reinforcement structure.

The reinforcement structure may be a unitary construction or of segmental construction. When of segmental construction, the reinforcement structure may comprise a plurality of parts adapted to cooperate to provide the necessary reinforcement.

The reinforcement structure may comprise a membrane attached to the mesh sheeting to provide reinforcement for the mesh sheeting. In such an arrangement, the reinforcement structure would be of unitary construction in that the membrane would be of one piece.

The membrane may comprise a continuous film. Alternatively, the membrane may be discontinuous; for example, the membrane may have perforations or other apertures therein. In this regard, the membrane may be a mesh.

In another arrangement, the reinforcement structure may comprise a plurality of segments attached to the mesh sheeting in a pattern to provide the necessary reinforcement. The segments may be of an appropriate configuration such as strips and may be positioned in overlapping relation. In such an arrangement, the reinforcement structure would be of segmental construction.

The reinforcement structure may comprise two membranes disposed on opposed sides of the mesh.

In another arrangement, said means associated with the mesh sheeting to resist distortion of the mesh in the manner described may comprise anchoring means between the warp strands and weft strands at points of intersection therebetween. The anchoring means may comprise bonding, such as chemical bonding or mechanical bonding, between the warp strands and weft strands at points of intersection therebetween.

In yet another arrangement, said means associated with the mesh sheeting to resist distortion of the mesh in the manner described may comprise a coating applied to the woven mesh to anchor the warp strands and weft strands together

at points of intersection therebetween. The coating may be applied in any appropriate way, such as for example powder-coating, painting or hot dipping.

The mesh sheeting may be formed of any appropriate material or materials, such as for example a metal, a plastics material, a fabric material or a combination thereof.

Where the mesh sheeting comprises woven mesh, the woven strands may comprise round wire (being wire of circular cross-section). Wire of other cross-sectional configurations may be used, including in particular flat wire (being wire with opposed sides which are flat and which are interconnected by rounded edges). Flat wire is advantageous in that is of reduced cross-sectional profile between the flat sides and so facilities a larger mesh pore size when oriented appropriately.

The membrane may comprise plastic sheeting. A suitable material for the membrane may comprise polyethylene. Other appropriate materials may, of course, also be used including PVC, polypropylene and polyamide.

The membrane may comprise a continuous film, although it need not necessarily be so.

The membrane may be adapted to provide a fluid barrier (typically, a moisture barrier) or it may be perforated or otherwise fluid permeable.

There may be two such membranes, one applied to each side of the mesh sheeting.

The advantage of having two membranes is that a relatively thinner film can be utilised as each membrane. It also provides symmetry which may facilitate ease of installation in the sense that the barrier may be deployed in either orientation.

The characteristics of the membrane, or each membrane, are selected according to the physical properties of the mesh sheeting. If the mesh sheeting is such that it requires a relatively high level of reinforcement in order for the composite barrier to be sufficiently functional for use, then a stronger membrane and/or two

membranes may be required. Alternatively, the corollary use of a lighter membrane with a denser mesh can also apply.

Where two membranes are utilised, they may be of the same material. Alternatively, the two membranes need not necessarily be of the same material or have the same physical characteristics; that is, different materials may be used for the two membranes, and also materials of varying thicknesses.

The membrane, or one or both of the membranes (in the case where there are membranes on opposed sides of the mesh sheeting), may incorporate a pest deterrent which serves to prevent, or assist in preventing, the passage of pests. The pest deterrent in the membrane or membranes may serve to repel approaching pests or kill them.

The membrane may be attached to the mesh sheeting in any appropriate way to provide the necessary reinforcement. The membrane may be attached to the mesh at a plurality of attachments points. Preferably, the plurality of attachments points are distributed throughout the plane of the membrane.

The membrane may be bonded to the mesh by ultrasonic welding, although of course various other methods of attachment may be used including, but not limited to, hot roller laminating and adhesive bonding.

The membrane may be bonded to the mesh at attachments points.

Where the mesh comprises woven mesh, the membrane is bonded to strands of the mesh. The woven strands present an array of peaks on each side of the mesh. With such an arrangement, the membrane may be attached to all, or at least some, of those peaks.

In addition to providing a reinforcement function, the membrane may function as a protective membrane to shield the person handling the composite pest barrier from direct contact with the pest deterrent. Accordingly, the protective membrane typically would not contain any pest deterrent or at least any pest deterrent present would be at a level deemed to be safe for handling purposes.

Preferably, the composite termite barrier is flexible to facilitate it being formed into configurations that can be maintained. In this way, the composite barrier can be deformed into profiles required for installation; for example, by folding, bending or creasing the composite termite barrier.

The composite termite barrier may be adapted to facilitate storage in roll form, from which sections can be unwound and cut to length.

According to a second aspect of the invention there is provided a composite pest barrier comprising mesh sheeting adapted to prevent the passage of pests therethrough and a membrane attached to the mesh sheeting to provide reinforcement for the mesh sheeting.

With this arrangement, the membrane contributes to the structural integrity of the barrier.

The mesh sheeting functions to provide an active pest barrier; that is, it operates to prevent the passage of pests therethrough The mesh sheeting may be adapted to prevent the passage of pests therethrough in any appropriate way.

In one arrangement of this second aspect of the invention, the mesh sheeting may have mesh openings of a size adapted to exclude the pests to be controlled.

In another arrangement of this second aspect of the invention., the mesh may incorporate a pest deterrent which serves to prevent, or assist in preventing, the passage of pests through the mesh. The pest deterrent may comprise pest resistant material applied to the mesh. With this arrangement, the pest resistant material may be impregnated in a coating applied to the mesh. The coating may be applied to the mesh in any suitable way. The coating may, for example, be applied by laminating it onto one side of the mesh or painting it onto the mesh. Where the mesh comprises woven strands, the coating may be applied to the strands. The strands may be coated prior to, or after, being woven to form the mesh. The coating may be of any suitable material. The coating may, for example, comprise a plastics material including thermoplastic materials such as polyethylene and polypropylene, as well as certain nylons and polyolefins. The coating may also be of certain thermosetting plastics materials such as

polyurethanes and certain polyesters. The coating may also comprise a foam plastics material. Further, the coating may comprise a metallic coating. The coating may be applied as a powder coating. Alternatively, the pest deterrent may be incorporated into the mesh sheeting itself; for example, the pest deterrent may comprise pest resistant material impregnated into the mesh sheeting, particularly in cases where the mesh sheeting is of a plastics material. The pest resistant material may be impregnated into all of the mesh sheeting or portions thereof. Where the mesh sheeting is formed of a plastics material, the pest resistant material may be impregnated into the plastics material

According to a third aspect of the invention there is provided a roll of pest barrier material, the pest barrier material comprising mesh sheeting adapted to prevent the passage of pests therethrough and a membrane attached to the mesh sheeting to provide reinforcement for the mesh sheeting.

According to a fourth aspect of the invention there is provided a pest barrier installed in a building structure, the pest barrier comprising a composite pest barrier according to the first or second aspect of the invention.

Preferably, the composite termite barrier is integrally attached to part of the building structure by an adhesive providing a bond between the membrane and said part of the building structure.

The adhesive may comprise a pest deterrent.

According to a fifth aspect of the invention there is provided a method of installing a pest barrier in a building structure, the method comprising providing a portion of pest barrier material comprising mesh sheeting adapted to prevent the passage of pests therethrough and a membrane attached to the mesh sheeting to provide reinforcement for the mesh sheeting, and establishing an adhesive bond between the membrane and part of the building structure.

The mesh sheeting may have a further membrane, with the two membranes applied to opposite sides of the mesh sheeting. One or both of the two membranes may contribute to the structural integrity of the barrier. Further, one or both of the two membranes may incorporate a pest deterrent.

Typically, the pest barriers according to the previous embodiments comprise termite barriers.

Brief Description of the Drawings

The invention will be better understood by reference to the following description of two specific embodiments thereof as shown in the accompanying illustrations, in which:

Figure 1 is perspective view of a composite barrier according to the first embodiment

Figure 2 is an exploded perspective view of the arrangement shown in Figure 1;

Figure 3 is an end view of the composite termite barrier shown in Figure 1;

Figure 4 is an end view of the arrangement shown in Figure 2;

Figure 5 is a perspective view of a composite barrier according to a second embodiment;

Figure 6 is an exploded perspective view of the arrangement shown in Figure 5;

Figure 7 is an end view of the composite termite barrier shown in Figure 5;

Figure 8 is an exploded perspective view of the arrangement shown in Figure 7;

Figure 9 is a fragmentary sectional enlarged view of a portion of the composite barrier according to the second embodiment;

Figure 10 is a perspective view of a composite barrier according to a third embodiment;

Figure 11 is a fragmentary sectional enlarged view of a portion of the composite barrier according to the third embodiment;

Figure 12 is a perspective view of a composite barrier according to a fourth embodiment;

Figure 13 is a perspective view of a composite barrier according to a fifth embodiment;

Figure 14 is a schematic perspective view of the composite barrier according to the second embodiment installed in a building construction;

Figure 15 is a schematic side view of the composite barrier according to the fifth embodiment installed in a building construction;

Figures 16, 17 and 19 are schematic side views of several stages in the installation process of the composite barrier according to the fifth embodiment in the manner depicted in Figure 15; and

Figures 19, 20 and 21 are schematic side views of several stages of an alternative installation process for the composite barrier according to the fifth embodiment.

Best Mode(s) for Carrying Out the Invention

The embodiments are directed to termite barriers for the protection of buildings and other structures from termites. The termite barriers according to the embodiments can be installed in buildings and other structures in any appropriate way, some typical examples of which include installations described and illustrated in Australian Patents 639256 and 696436. The termite barriers according to the embodiments can be deployed in various other ways and are not limited to such installations.

Referring now to Figures 1 to 4, there is shown a composite termite barrier 10 comprising a mesh sheet 13, and a membrane 15 attached to one side of the mesh sheet by being bonded thereto. In effect, the membrane 15 is laminated onto the side of the mesh sheet 13. Typically, the membrane 15 covers the entire side of the mesh sheet 13 to which it is bonded. In this embodiment, the mesh

sheet 13 comprises metal mesh, typically stainless steel mesh. Other forms of mesh can, of course, be used, including plastic mesh.

In the arrangement illustrated, the mesh sheet 13 is woven wire mesh comprising strands 17 cooperating to define openings 19 in the mesh. With this arrangement, the woven pattern provides an array of peaks 21 on each side of the mesh sheet 13 at the junctions between intersecting strands.

The mesh sheet 13 functions as an active termite barrier; that is, the mesh sheet is configured to exclude the passage of termites therethrough. In particular, the opening 19 of the mesh sheet 13 have a linear dimension in any direction less than the maximum linear dimension of the cross section of the head of the species of termite to be controlled.

By way of example only, and without limitation, the mesh may comprise stainless steel woven mesh woven from wire which is less than or equal to 0.18 mm in diameter. In certain instances, the wire from which the mesh is woven may be 0.17 mm diameter. The wire is woven to provide mesh openings of a size appropriate for target termites of the species of termites to be controlled. For certain termite species the mesh opening size may be about 0.8 mm by 0.8 mm, while for certain other termite species the opening size may be about 0.45 mm by 0.45 mm. The ability to use stainless steel wire in the mesh sheeting 15 of a smaller wire diameter than that currently used with stainless steel woven mesh termite barriers provides significant cost advantages, as alluded to earlier.

The membrane 15 comprises a sheet of flexible plastics material such as polyethylene. While not shown in the accompanying illustrations, the membrane 15 may have perforations through which air and moisture can pass for ventilation and drainage, if desired.

The membrane 15 is attached to the mesh sheet 13 to provide reinforcement for the mesh. More particularly, the membrane 15 reinforces the mesh sheet 13 again distortion in the plane of the sheet, thereby constraining against displacement prevents adjacent wire strands 17 shifting laterally to an extent which would

increase the size of the respective mesh openings 19 to no longer be capable of excluding termites of the type to be controlled.

In this embodiment, the membrane locates against, and is attached to, the respective peaks 21a on the adjacent side of the mesh sheet.

The membrane 15 is bonded to the mesh sheet strands by ultrasonic welding. Other methods of attachment may, of course, be used including, but not limited to, hot roller laminating and adhesive bonding.

The membrane 15 may be coloured for identification purposes.

The membrane 15 may also function as a waterproof barrier.

The membrane is of a thickness selected to be appropriate for the purpose. Typically, the membrane would be of a thickness in the range between about 40 microns and 500 microns. In instances where the membrane is required to function as a waterproof barrier, it may be of a thickness in excess of 500 microns.n the prior art termite barriers described and illustrated in the aforementioned installations described and illustrated in Australian Patents 639256 and 696436, the termite barrier material comprised a mesh sheet of a material resistant to breakdown in the environment of use and substantially resistant to termite secretions and has a hardness of not less than about Shore D70, the pores of said mesh having a linear dimension in any direction less than the maximum linear dimension of the cross section of the head of the species of termite to be controlled.

In this embodiment, a less robust mesh material can be utilised as the mesh sheet 13. In particular, mesh material incorporating a reduced amount of stainless steel material can be used, thereby offer a significant saving in the cost of the mesh. The reduction in the amount of stainless steel may be accomplished by selection of a mesh material having strands of smaller diameter, or an increase in the spacing between the strands, or both strands of smaller diameter and an increase in the spacing between the strands. In this embodiment, the wire strands 19 may be less than or equal to 0.18 mm in diameter and at spacings of less than or equal to 0.8 mm. Such dimensions are indicative, and are provided for illustrative

purposes only, and are not intended to be limiting. Various other mesh dimensions may be adopted for implementation of the invention in keeping with the objective of reducing the quantity of material in the mesh. It is expected that this would offer significant efficiency gains while also providing a mesh pore size sufficient for the mesh to exclude termites of the type to be controlled.

The use of such less robust mesh have result in a mesh which is inferior in terms of structural stability; that is, the mesh may be "floppy" or have "sleaziness" when in isolation. Consequently, the mesh may have insufficient structural rigidity for handling and installation. This is addressed by the presence of the membrane 15 which acts to support the mesh and provide the composite termite barrier 10 with sufficient structural rigidity for its intended purpose, thereby avoiding distortion of the mesh to an extent that the mesh openings would change in size or configuration so as to no longer be effective to provide a barrier to termite movement.

It is not essential that the mesh sheet 13 have openings 19 of a size sufficiently small to prevent the passage of termites being controlled therethrough. In other words, the mesh sheet 13 need not necessarily provide a physical barrier in itself. The mesh sheet 13 may incorporate a termite deterrent (such as a termiticide or other deterrent agent) which serves to prevent, or assist in preventing, the passage of termites through the mesh. The deterrent effect is attained through repelling termites approaching the mesh sheet 13 or alternatively killing termites contacting the mesh sheet 13. In this way, the mesh sheet 13 would still perform the function of an active barrier, but would involve chemical characteristics as well as physical characteristics to perform that function as found in physical chemical barriers.

The mesh sheet 13 is flexible to facilitate selective deformation out of the plane of the sheet while having sufficient rigidity to allow the deformed state to be maintained. In this way, the composite barrier 10 can be modelled into profiles required for installation; for example, by folding, bending or creasing the composite termite barrier.

The composite termite barrier 10 may be stored in roll form so that a section can be unwound and cut to length.

The use of mesh material having strands of smaller diameter and/or an increase in the spacing between the strands allows rolls of greater length to be manufactured. This may facilitate completion of a termite barrier installation in a typical building structure such as a house using only one roll, providing a cost-saving in roll transport and handling, as well as avoiding the need to join a new roll to a depleting roll.

The use of mesh material having strands of smaller diameter and/or an increase in the spacing between the strands also provides a product with a lower mass per unit area, thereby providing a cost saving in transportation.

In addition to providing support for the mesh sheet 13, the membrane 15 may function as a protective membrane. Specifically, the membrane 15 may allow a person handling the composite pest barrier 10 to avoid contact with any termite deterrent incorporated in the mesh sheet 13. The protective membrane would serve to shield the person handling the composite pest barrier from direct contact with the pest deterrent, and accordingly would typically not incorporate any pest deterrent, or at least any pest deterrent present would be at a level deemed to be safe for handling purposes.

The membrane 15 provides the particular advantage that it facilitates the use of an adhesive system in which the adhesive can be delivered and applied in any appropriate way. In one arrangement, the adhesive may be delivered and applied from a cartridge using an applicator gun; that is, the adhesive may comprise a so-called gunnable adhesive. In another arrangement, the adhesive may be delivered and applied from a bulk supply as a spray. In any event, he presence of the membrane facilities use of now commonly available adhesives which are effective and convenient to use primarily because of their ease of application. Such adhesives include solvent based polymer adhesives, including PVC, polyurethane and acrylic based adhesives. Such adhesives are particularly convenient for use, particularly when in the form of a spray adhesive. A water based spray adhesive may also be suitable.

In the prior art termite barriers using stainless steel mesh (for example, as used in the aforementioned installations described and illustrated in Australian Patents 639256 and 696436), there is a need to use a specific adhesive composition known as "parge" to integrally secure the mesh to a part of a building structure to establish a termite barrier. The use of commonly available adhesives that are now available and appropriate for use with some termite barriers does not permit ease of use , as many such adhesives were limiting in bonding stainless steel mesh.

This is addressed in the present embodiment by the presence of the membrane 15 with which available adhesives that are appropriate for use with termite barriers can be used. In this way, the composite termite barrier 10 can be adhesively secured to a part of the building structure through the membrane 15.

If desired, the adhesive may incorporate a termite deterrent agent such as a termiticide.

Referring now to Figures 5 to 9, there is shown a composite termite barrier 10 according to a second embodiment. The termite barrier according to the second embodiment is similar to the first embodiment, except that it includes a further membrane 25 affixed to the other side of the mesh sheet 13. In this embodiment, the further membrane 25 is of the same material as the membrane 15, although in other embodiments it may be of different material and different thicknesses.

The membrane 25 is attached to the mesh sheet 13 to provide reinforcement for the mesh in a manner similar to the membrane 15. In this embodiment, the membrane 25 locates against, and is attached to, the respective strands on the adjacent side of the mesh sheet.

The advantage of having the two membranes 15, 25 is that a relatively thinner film can be utilised as each membrane. Additionally, the presence of the two membranes 15, 25 provides the mesh sheet 13 with additional structural support and also symmetry for ease of installation in the sense that the barrier may be deployed in either orientation. This may be conducive to use of an even less robust mesh material than in the first embodiment.

In this embodiment, the two membranes 15, 25 follow the profile of the respective faces of the mesh sheet 13 to which they are applied and extend partially into the mesh openings 19 without extending so far as to be in contact, as best seen in Figure 9.

Referring now to Figures 10 and 11, there is shown a composite termite barrier 10 according to a third embodiment. The termite barrier according to the third embodiment is similar to the second embodiment, except that the two membranes 15, 25 extend sufficiently into the mesh openings 19 so as to be in contact with each other within the mesh openings, as best seen in Figure 11. With this arrangement, the membranes 15, 25 in effect encapsulate the woven mesh and may afford certain advantages such as enhanced protection for the woven mesh.

Referring now to Figure 12, there is shown a composite termite barrier 10 according to a fourth embodiment. The termite barrier according to the fourth embodiment is similar to the second and third embodiments in that there are membranes 15, 25 on opposed sides of the mesh sheet 13. In this embodiment, the membranes 15, 25 extend beyond the mesh sheet 13 on at least one side thereof embodiment, with the extended portions 15a, 25a being bonded together to provide a selvage 27.

Referring now to Figure 13, there is shown a composite termite barrier 10 according to a fifth embodiment. The termite barrier according to the fifth embodiment is similar to the second, third and fourth embodiments in that there are membranes 15, 25 on opposed sides of the mesh sheet 13. In this fifth embodiment, the membranes 15, 25 are disposed inwardly of two opposed edges 29 of the mesh sheet 13. In this way, the composite termite barrier 10 according to a fifth embodiment comprises a central portion 31 and two lateral portions 33, with the central portion comprising a combination of mesh and membrane material and each lateral portion 33 comprising mesh only. The lateral portions thus provide two longitudinal bands of mesh on opposed sides of the central membranes. Typically, the longitudinal bands would each have a width of about 100 mm, although other widths can also be used.

This arrangement may be advantageous in circumstances where the composite barrier can either be integrally secured to an adjacent structure by embedding it in the structure or be bonded to an adjacent surface using an adhesive that is compatible with the mesh material. Such an adhesive may comprise a cement-based adhesive, including an adhesive known as parge, suitable for use in adhesively bonding mesh material to surfaces to provide a termite impervious connection therebetween.

In a variation to this arrangement, the two membranes 15, 25 may be offset to one side of the mesh sheet 13 so as to provide a band of mesh on one side only.

In yet another variation, there may be a membrane on one side only of the mesh sheet

Referring now to Figure 14, there is shown a termite barrier 40 installed in a building construction 50. The termite barrier 40 comprises a strip 41 of the composite termite barrier 10 according to the second embodiment. The strip 41 comprises a first longitudinal portion 43 and a second longitudinal portion 44 on opposed sides thereof.

The building construction 50 comprises a concrete slab 51 at or near ground level. The concrete slab 51 supports a wall construction 53 comprising an external wall 55 and an internal wall 57 with a wall cavity 59 therebetween.

The slab 51is configured as a box slab and incorporates an integral footing 61. A rebate 63 is incorporated in the side of the slab 51 to provide a footing 65 for the external wall 55. The internal wall 57 is supported on the upper face 66 of the slab 51 immediately adjacent the rebate 63. The rebate 63 presents a side face 67 which confronts the cavity 59.

In the arrangement shown, the externals wall 55 is of brick construction, comprising a plurality of courses of bricks 71 assembled in known manner with mortar therebetween, and the internal wall 57 is of framed construction of known kind.

The a strip 41 of the composite termite barrier is integrally secured between the external wall 55 at a location above ground level, and the side face 67 of the rebate 63 to provide a barrier against termite entry into the building construction 50.

The first longitudinal portion 43 of the strip 41 is integrally secured to the side face 67 of the rebate 63 by being adhesively bonded thereto by adhesive 77. The presence of the membranes 15, 25 on the opposed sides of the mesh sheet 13 allows use of a commonly available adhesive appropriate for use with termite barriers. The adhesive 77 may be applied between the first longitudinal portion 43 of the strip 41 and the side face 67 of the rebate 63 in any suitable way, such as by spray application to either one or both of the surfaces prior to the surfaces being brought together to effect an adhesive bond therebetween. A supplementary fixing system (not shown), such as nailing at intervals along the length of the strip, may be provided to maintain the first longitudinal portion 43 of the strip 41 in position on the side face 67 of the rebate 63 until such time as the adhesive bond becomes effective.

The second longitudinal portion 44 is integrally secured to the external wall 55 by being positioned between two courses of bricks 71.

The wall construction 53 in the arrangement shown also includes a moisture barrier 80.

Referring now to Figure 15, there is shown another form of termite barrier 90 installed in the building construction 50. The termite barrier 90 comprises a strip 91 of the composite termite barrier 10 according to the fifth embodiment. The strip 91 comprises a first longitudinal portion 93 and a second longitudinal portion 94 on opposed sides thereof. As described above, the composite termite barrier 10 according to the fifth embodiment comprises the central portion 31 and two lateral portions 33, with the central portion 31 comprising a combination of mesh and membrane material and each lateral portion 33 comprising mesh only. With this arrangement, one lateral portion 33 defines the first longitudinal portion 93 and the other lateral portion 33 defines the second longitudinal portion 94.

The first longitudinal portion 93 of the strip 91 is integrally secured to the side face 67 of the rebate 63 by being adhesively bonded thereto by adhesive 97. Because the first longitudinal portion 93 comprises mesh only, the adhesive 97 comprises adhesive compatible with the mesh material. Such an adhesive may comprise a cement-based adhesive, including an adhesive known as parge, suitable for use in adhesively bonding mesh material to surfaces to provide a termite impervious connection therebetween. With this arrangement it is possible to achieve good bonding between the mesh and the side face 67 because the adhesive can penetrate the mesh openings 19.

The second longitudinal portion 94 is integrally secured to the external wall 55 by being positioned in the mortar bed between two courses of bricks 71. With this arrangement it is possible to achieve good bonding between the mesh and the external wall 55 because mortar between the two brick courses can penetrate the mesh openings.

In the termite barrier 90, the central portion 31 extends across the wall cavity 59, as shown in the drawings.

In Figures 16, 17 and 18 there is shown the several stages in the installation of the termite barrier 90.

Referring now to Figures 19, 20 and 21, there is shown several stages in the installation of a termite barrier 100. The termite barrier 100 comprises a strip 101 comprising a composite termite barrier 10 having a first longitudinal portion 103 integrally secured to the upper face 66 of the slab 51 by being adhesively bonded thereto by adhesive 97 and the second longitudinal portion 104 integrally secured to the external wall 55 by being positioned between two courses of bricks 71. In the arrangement shown, the external wall 55 is supported in a footing 65 formed separately of the slab 51.

The arrangements illustrated in Figures 14 to 21 merely illustrate several ways in which the composite barriers 10 according to the embodiments can be installed. It should be understood that the composite barriers 10 according to the

embodiments can be installed in a variety of other ways to provide termite barriers and are not limited to the installation arrangements depicted.

In the embodiments described, the mesh sheet 13 comprised stainless steel wire mesh. It should be understood that the invention is not limited to use of stainless steel wire mesh. Other metal wire mesh may be used, which in itself may provide efficiency gains. Similarly, the wire mesh need not be metal. The mesh may, for example, comprise an appropriate plastics material.

The mesh may also incorporate a termiticide, as previously described.

From the foregoing, it is evident that the embodiments each provide a composite termite barrier involving a mesh structure and a supporting membrane, offering efficiency gains through use of less material in the mesh structure, or alternatively lower cost mesh materials, than is possible with the prior art arrangement described previously.

Throughout the specification and claims, unless the context requires otherwise, the word "comprise" or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

The Claim Defining the Invention is as Follows:

1. A composite pest barrier comprising mesh sheeting adapted to prevent the passage of target pests therethrough and means associated with the mesh sheeting to resist distortion of the mesh in a manner which would cause one or more mesh openings therein to change in size or configuration to permit the passage of target pests through the mesh.

2. The composite pest barrier according to claim 1 wherein the mesh sheeting comprises woven mesh, and wherein the distortion comprises displacement between the warp and weft strands at points of intersection therebetween causing the adjacent mesh openings to change in size or configuration.

3. The composite pest barrier according to claim 2 wherein said means associated with the mesh sheeting to resist distortion of the mesh is adapted to constrain the warp strands and weft strands from displacement with respect to each other at points of intersection therebetween.

4. The composite pest barrier according to claim 1, 2 or 3 wherein said means associated with the mesh sheeting to resist distortion of the mesh comprises a reinforcement structure.

5. The composite pest barrier according to claim 4 wherein the reinforcement structure is of a unitary construction
.

6. The composite pest barrier according to claim 4 wherein the reinforcement structure is of segmental construction.

7. The composite pest barrier according to claim 4, 5 or 6 wherein the reinforcement structure comprises a membrane attached to the mesh sheeting to provide reinforcement for the mesh sheeting.

8. The composite pest barrier according to claim 7 wherein the membrane comprises a continuous film.

9. The composite pest barrier according to claim 8 wherein the membrane comprises plastic sheeting.

10. The composite pest barrier according to any one of claims 4 to 8 wherein the reinforcement structure comprises two such membranes, one applied to each side of the mesh sheeting.

11. The composite pest barrier according to claim 10 wherein the two membranes are composed of the same material.

12. The composite pest barrier according to any one of the preceding claims wherein the or each membrane is bonded to the mesh sheeting.

13. The composite pest barrier according to claim 4 or 6 wherein the reinforcement structure may comprise a plurality of segments attached to the mesh sheeting in a pattern to provide the necessary reinforcement.

14. The composite pest barrier according to claim 2 or 3 wherein said means associated with the mesh sheeting to resist distortion of the mesh comprises anchoring means between the warp strands and weft strands at points of intersection therebetween.

15. The composite pest barrier according to claim 2 or 3 wherein said means associated with the mesh sheeting to resist distortion of the mesh comprises a coating applied to the woven mesh to anchor the warp strands and weft strands together at points of intersection therebetween.

16. A composite pest barrier comprising mesh sheeting adapted to prevent the passage of pests therethrough and a membrane attached to the mesh sheeting to provide reinforcement for the mesh sheeting.

17. The composite pest barrier according to claim 16 comprising a further membrane wherein the two membranes are disposed on opposed sides of the mesh sheeting.

18. The composite pest barrier according to claim 17 wherein the two membranes encase the mesh sheeting.

19. The composite pest barrier according to claim 16, 17 or 18 wherein the or each membrane is disposed within the confines of the mesh sheeting whereby there is a band of mesh along at least one side of the mesh sheeting.

20. A roll of pest barrier material, the pest barrier material comprising mesh sheeting adapted to prevent the passage of pests therethrough and a membrane attached to the mesh sheeting to provide reinforcement for the mesh sheeting

.

21. A pest barrier system installed in a building structure, the pest barrier system comprising a composite pest barrier according to any one of the preceding claims.

22. The pest barrier system according to claim 21 wherein the composite pest barrier is integrally attached to part of the building structure by an adhesive providing a bond between the membrane and said part of the building structure.

23. A method of installing a pest barrier in a building structure, the method comprising providing a portion of pest barrier material comprising mesh sheeting adapted to prevent the passage of pests therethrough and a

membrane attached to the mesh sheeting to provide reinforcement for the mesh sheeting, and establishing an adhesive bond between the membrane and part of the building structure.

24. A composite termite barrier substantially as herein described with reference to the accompanying drawings

25. A termite barrier system substantially as herein described with reference to the accompanying drawings

26. A method of installing a pest barrier substantially as herein described.

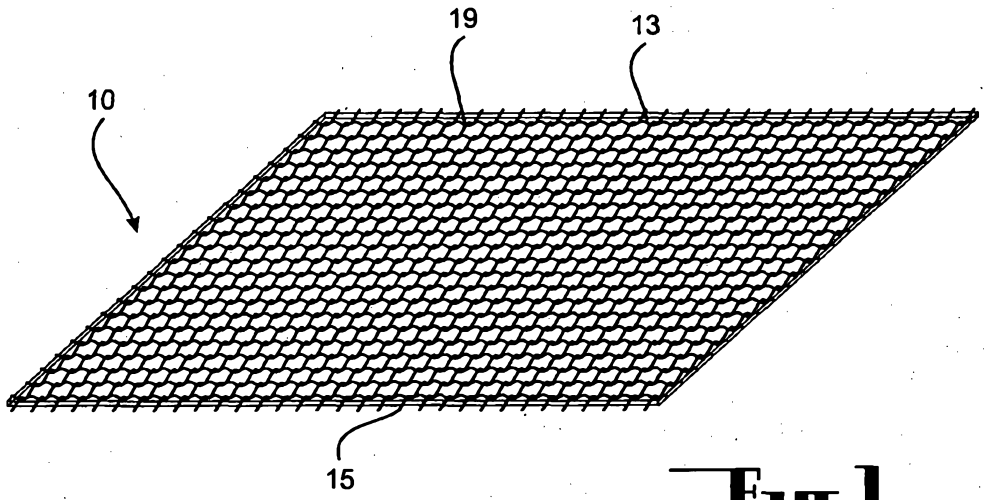


Fig. 1

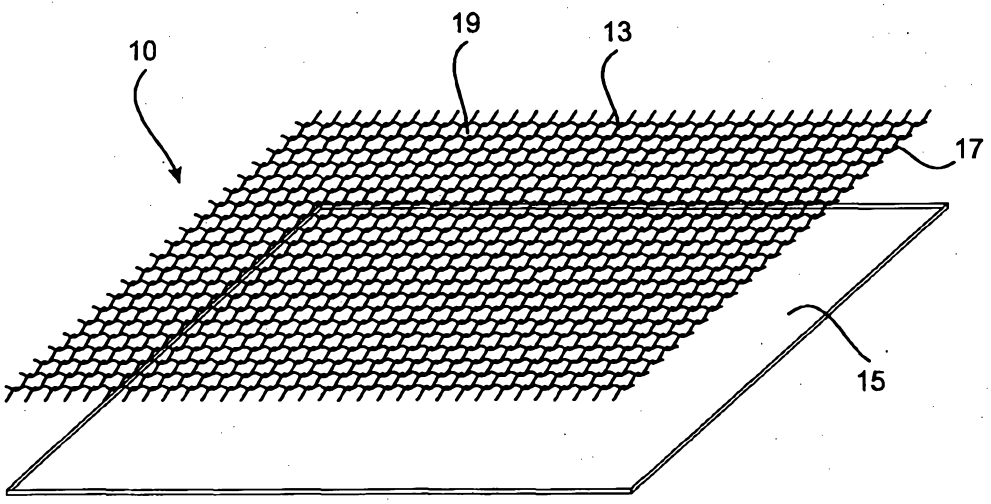


Fig. 2

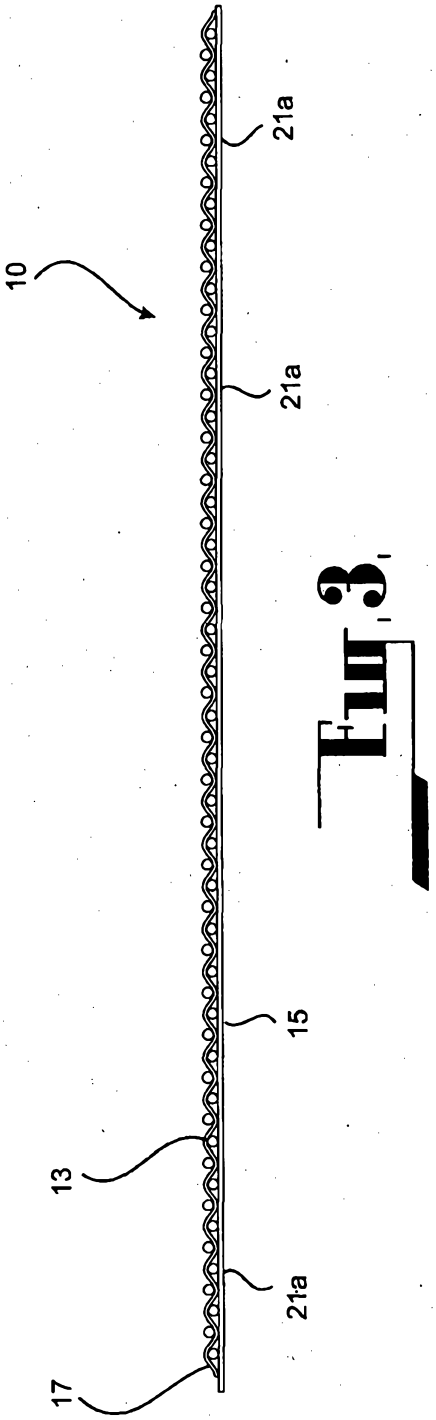


Fig. 3

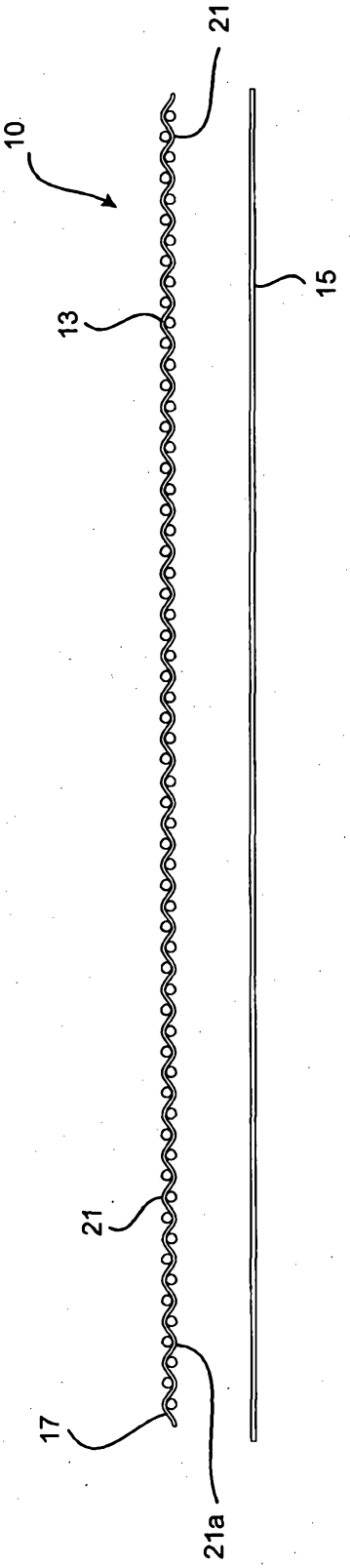
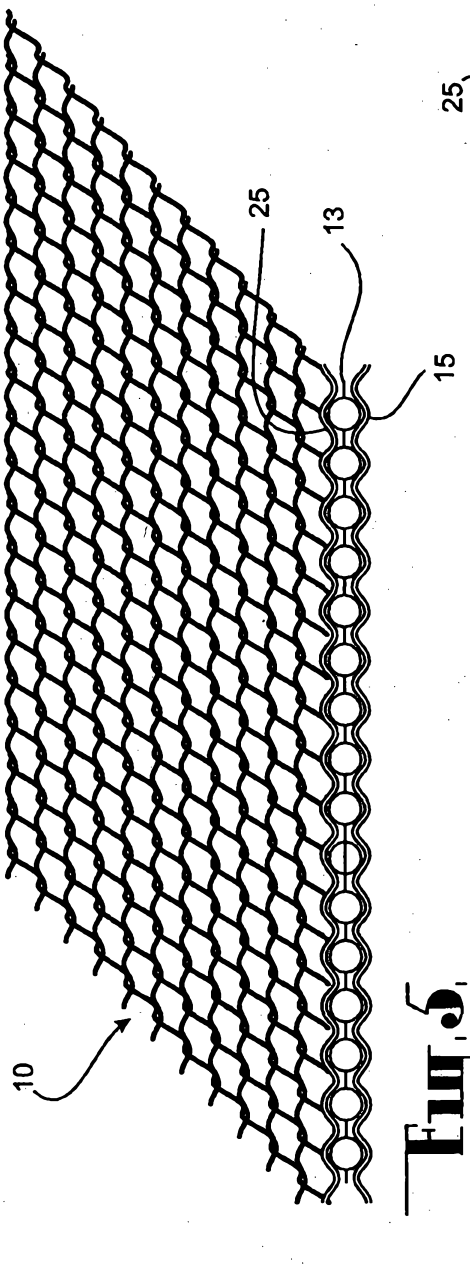
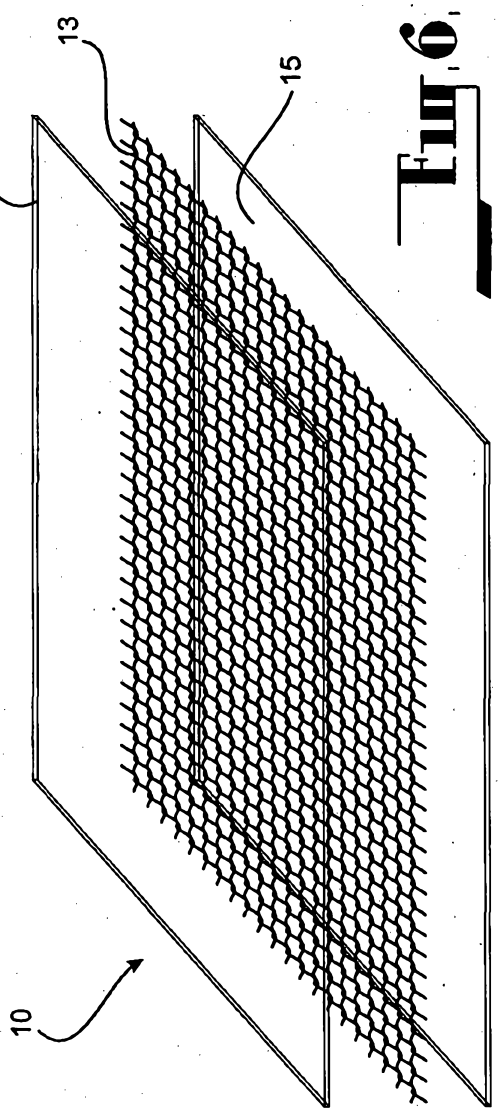


Fig. 4



Фиг. 5



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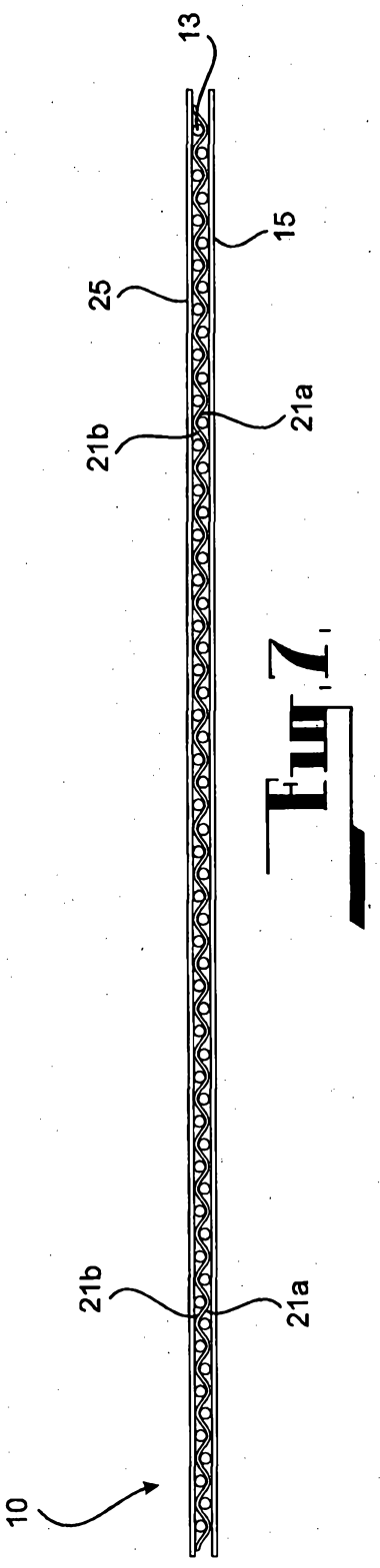

Fig. 7

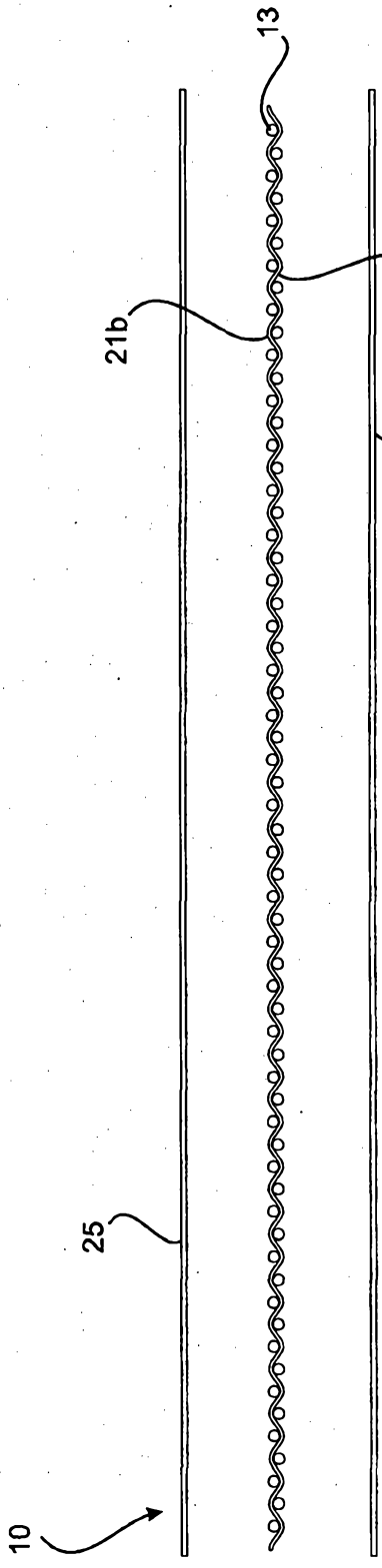

Fig. 8

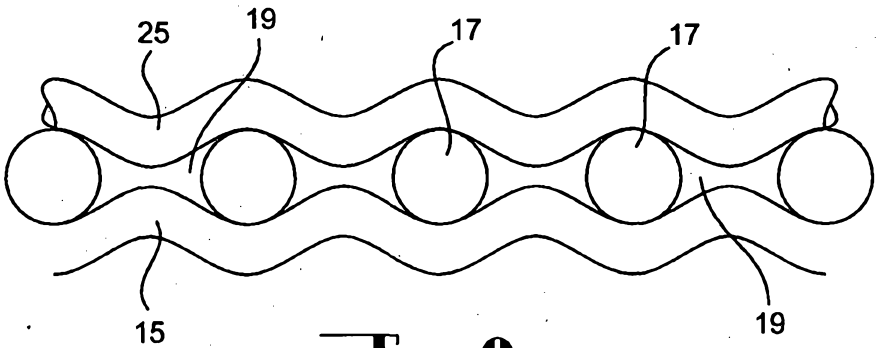

Fig. 9

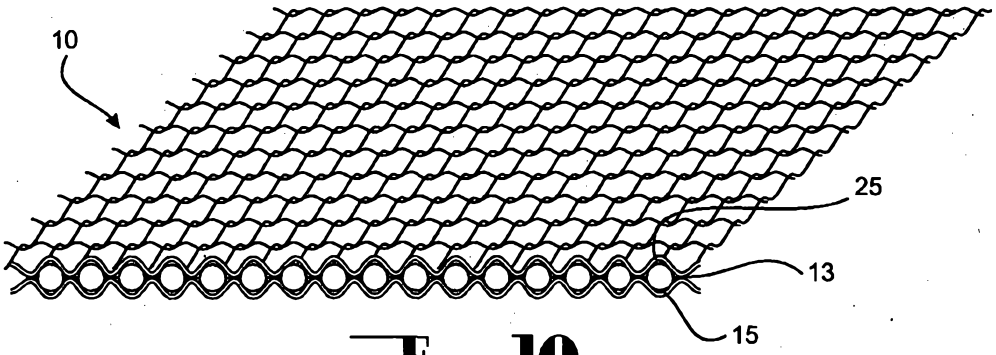

Fig. 10

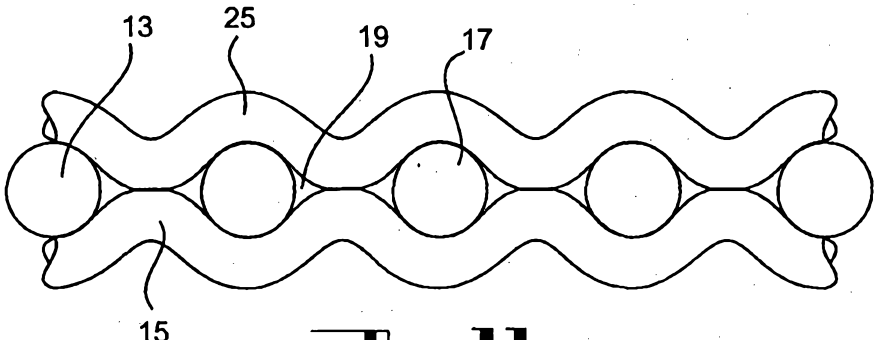

Fig. 11

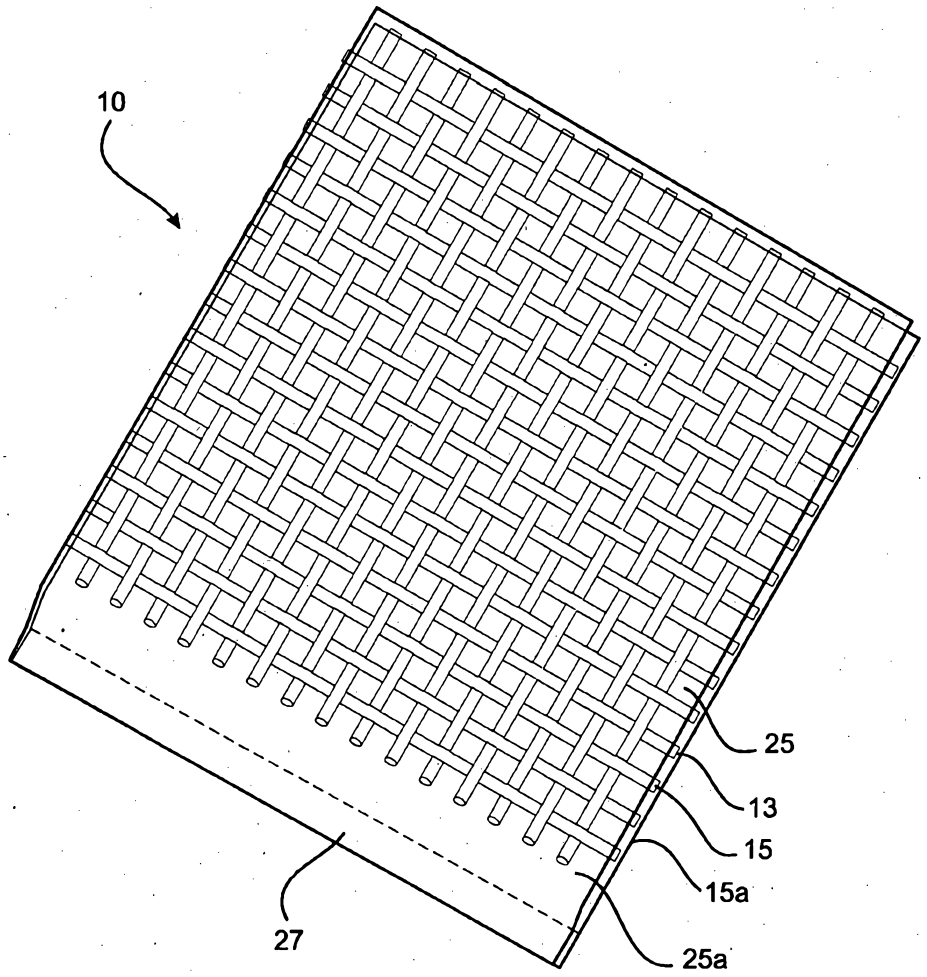

Fig.12.

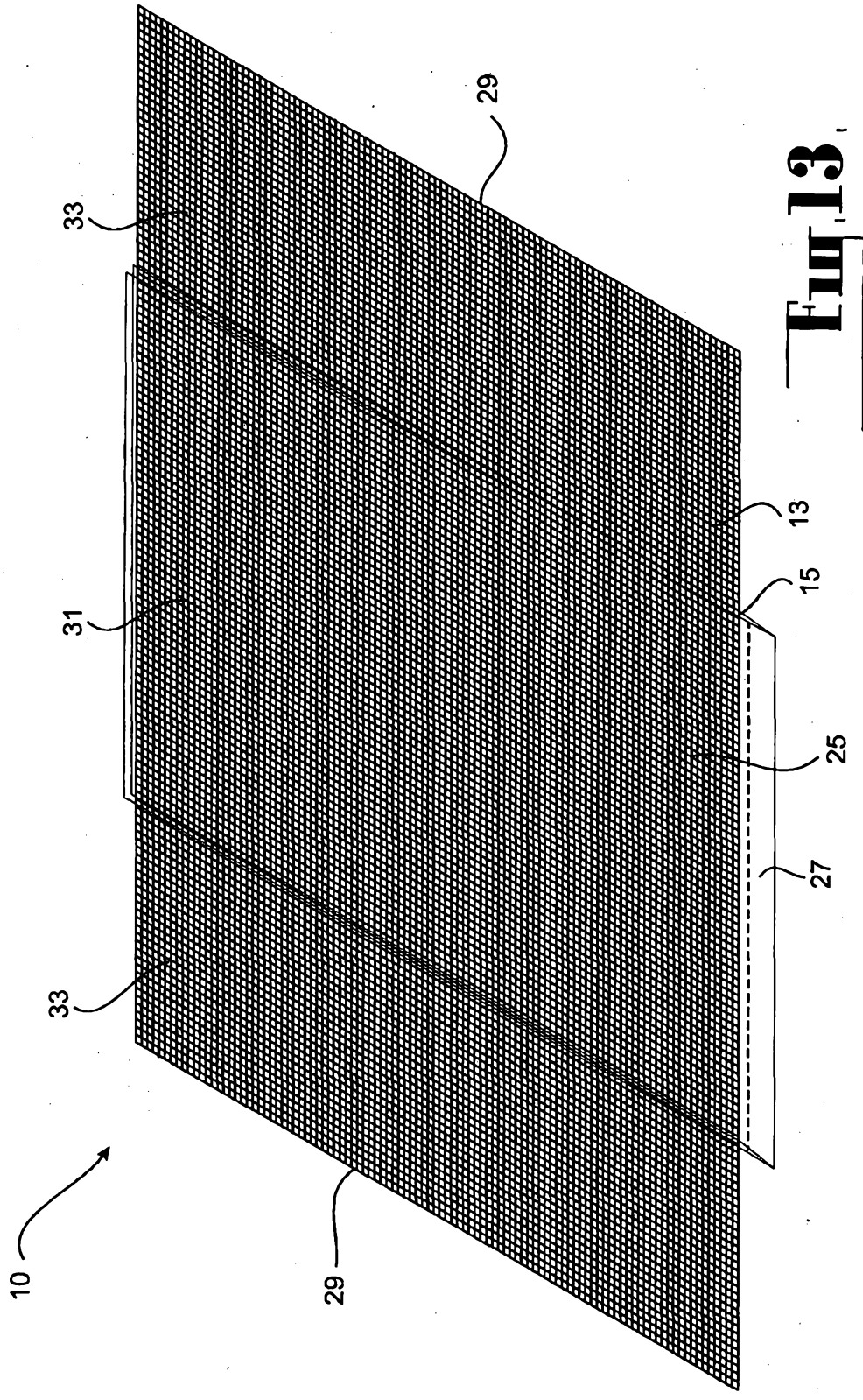

Fig. 13

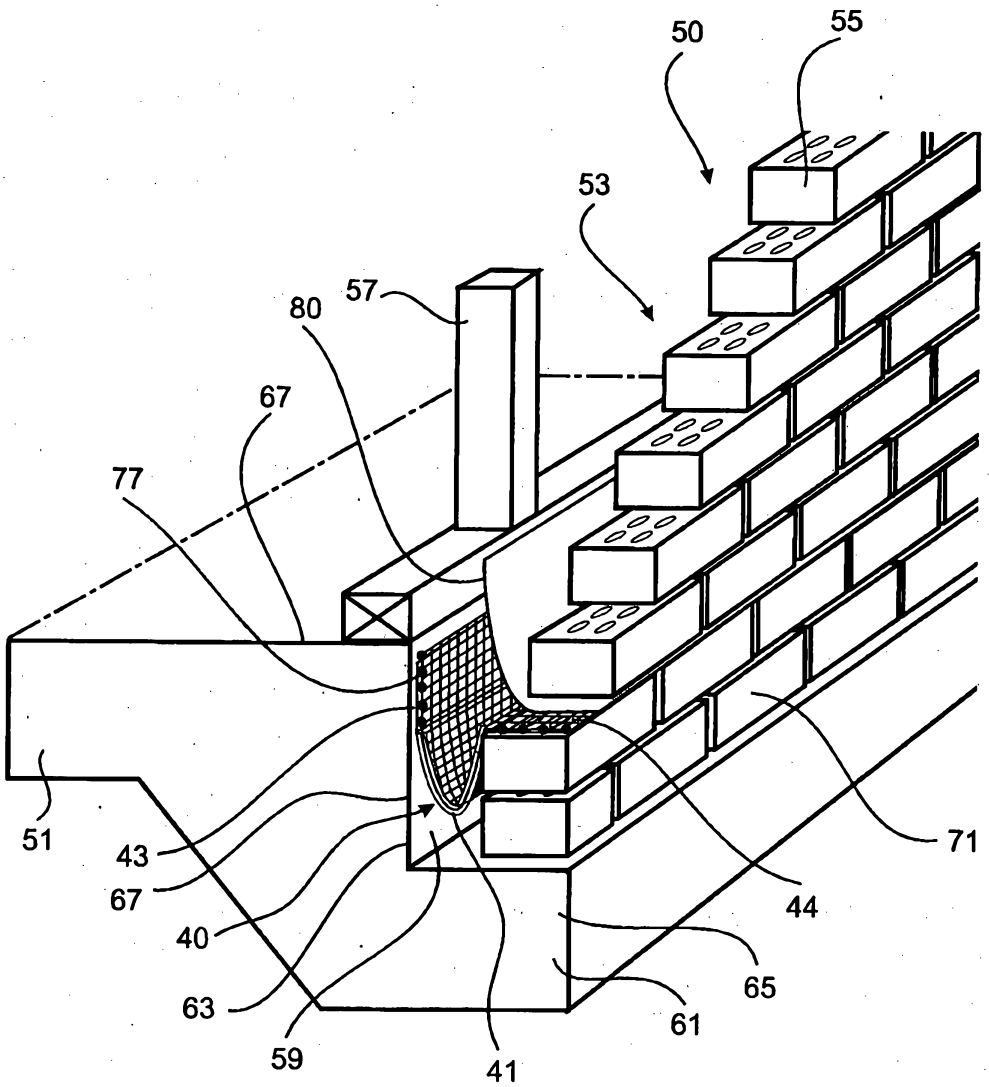

Fig.14

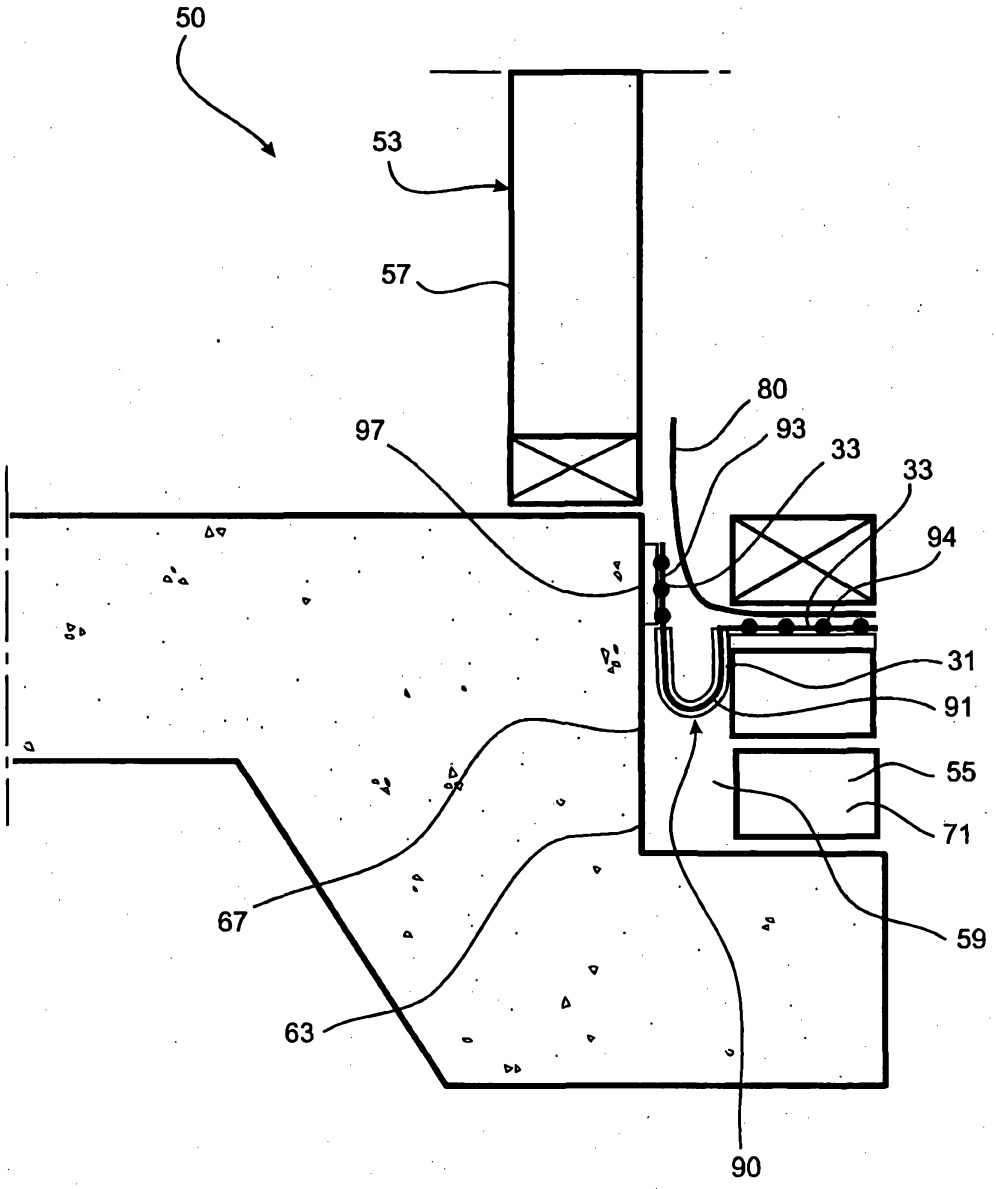

Fig. 15

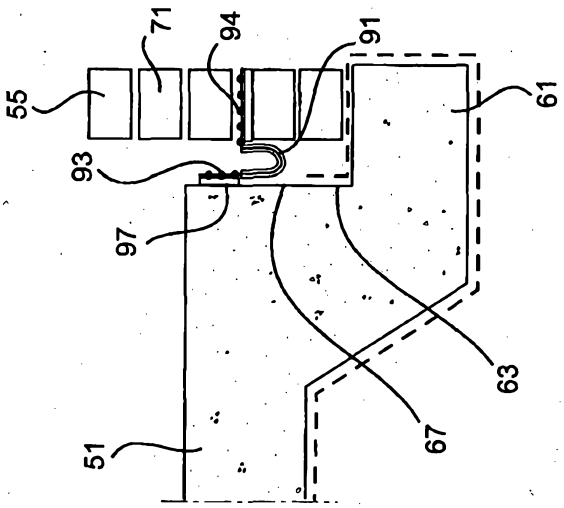

Fig. 18

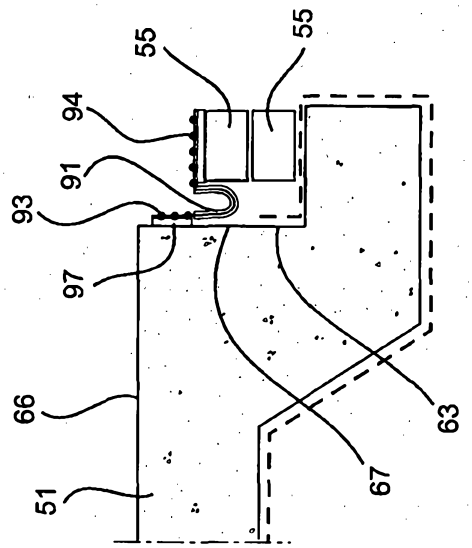

Fig. 17

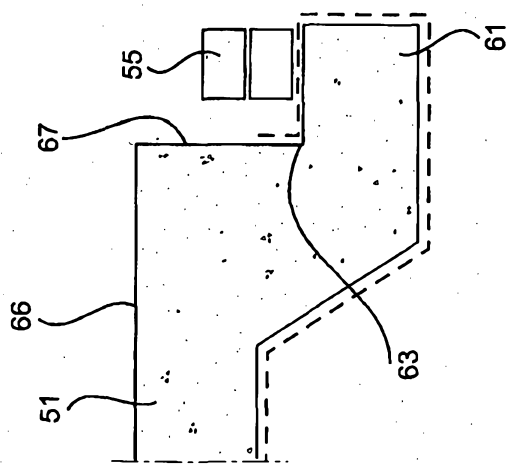

Fig. 16

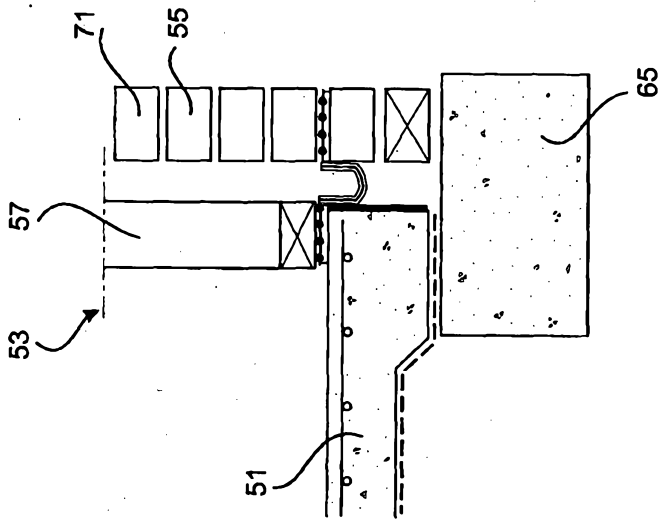

Fig. 21

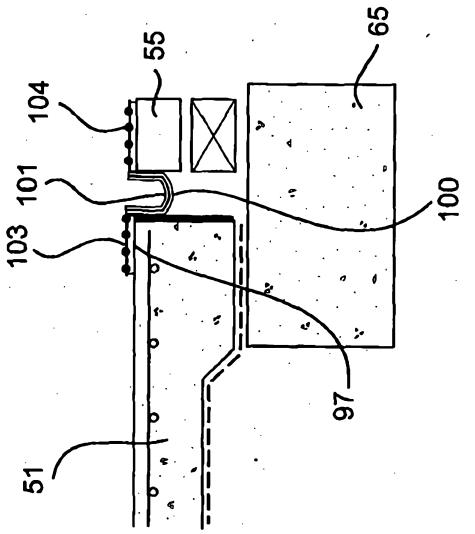

Fig. 20

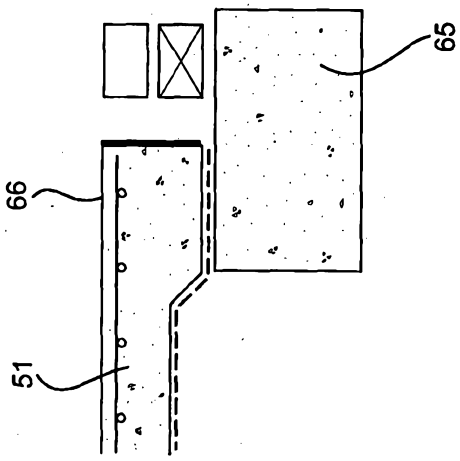

Fig. 19