A roll-form building material spacer product providing air space and drainage passageways within a building structure. The building material spacer has an openwork structure and carries an antifungal agent which prevents the growth of mold and mildew within a building structure in which the spacer is installed. Preferably, the antifungal agent is dispersed evenly throughout the openwork material either within the material or coated on the material. A building structure assembly having the openwork spacer and methods of making an openwork spacer and making a building structure with the spacer are also provided.
FIG. 10

FIG. 11
MOLD AND MILDEW RESISTANT OPENWORK BUILDING MATERIAL

FIELD OF THE INVENTION

[0001] The present invention relates to a building material, such as an openwork spacer, for forming drainage and ventilation passageways within a wall, roof or like structure of a building to prevent the accumulation of moisture and the growth of mold, mildew, bacteria and other fungi therein. The present invention also relates to a building structure system, or assembly, having the spacer, to a method of assembling a building structure, and to a method of manufacturing an openwork building material.

BACKGROUND OF THE INVENTION

[0002] Moisture and other substances can accumulate and become trapped within a structure, such as a wall or roof of a building, and cause premature deterioration of the structure. For instance, wind driven rain may penetrate within a wall/roof, or condensation may form within a wall/roof as a result of moisture vapor escaping outwardly of a building through a house-wrap product. Other problems can result from moisture contained in the lumber utilized to construct the wall/roof or from other substances, such as corrosive surfactants, which may leak from certain types of outer siding and roofing materials.

[0003] Wall and roof structures of buildings have been assembled with building materials, such as openwork spacers, to combat the problem of moisture accumulation and the like. To this end, the openwork spacer is assembled within the wall or roof structure and provides a network of ventilation and drainage passageways therethrough. Thus, the spacer permits liquids to drain from the structure and ambient air to flow within the structure to evaporate and remove any moisture therein.

[0004] An example of a building material for use in providing a path of ventilation in a roof or wall of a building structure is disclosed in U.S. Pat. No. 5,099,627 issued to Coulton et al. and assigned to Benjamin Obdyke, Inc., the assignee of the present application. According to the Coulton patent, an openwork member located between an inner sheathing member and an outer building material provides vapor flow paths therethrough to prevent moisture from becoming entrapped between the inner sheathing member and outer building material. Also see Benjamin Obdyke, Inc.’s commercially available CEDAR BREATHER underlayment spacer product for use with wooden shingle installations.


[0006] Other examples of building materials that provide ventilation and/or drainage functions within a building structure are disclosed in U.S. Pat. Nos. 5,826,390 issued to Sacks; 6,131,253 issued to Egan; 6,233,820 issued to Tonyan; 5,598,673 issued to Atkins; 5,860,259 issued to Laska; 4,538,388 issued to Friesen; 4,805,367 issued to Kleckner; 4,315,392 issued to Sylvest; 5,489,462 issued to Sieber; and 5,383,314 issued to Rothberg. The Sacks patent discloses a vapor permeable membrane having spacers thereon for the purpose of providing drainage passageways within a wall of a building, and the Tonyan patent discloses a weather resistive membrane having an attached mesh material which provides open spaces for the flow of moisture downwardly within a wall structure. The Egan patent discloses a drainage mat including a vapor permeable membrane and an openwork mat of filaments having a waffle-like structure. The Laska and Atkins patents disclose products for providing open drainage paths behind masonry walls. The Kleckner, Friesen and Sylvest patents disclose products for providing ventilation within roof structures, and the Sieber and Rothberg patents disclose plastic sheet drainage mats.

[0007] The presence of moisture within a wall or roof of a building can lead to the development and growth of mold, mildew and like fungi within wall/roof spaces. The presence of mold spores and the like can create health concerns. For example, in an article titled “Dupont TYYVEK Helps Solve Moisture Problems in California Schools” which was recently published on the Internet, it is reported that the presence and discovery of toxic spores within rotting walls have forced school closings. The article suggests the interior wood wall framing, which is made of non-klm dry lumber, be sprayed with a non-carcinogenic fungicide to pre-empt the growth of any mold or mildew.


[0009] Although the drainage and/or ventilation spacer products and other building materials disclosed in the above referenced patents, published patent applications and published article may function satisfactorily for their intended purposes, there remains a need for an improved openwork spacer building material which can be used to form drainage and ventilation passageways within a wall, roof or like structure of a building and which can prevent the accumulation of moisture and the growth of mold, mildew, bacteria and other fungi within the wall/roof structure. Preferably, the spacer should permit ready installation requiring only a minimum of skill, should provide drainage and/or ventila-
tion paths along the inner sheathing member and the outer building material, and should also provide ventilation paths transversely through the spacer. In addition, preferably the spacer should be lightweight and inexpensive to manufacture and should be provided in a form permitting efficient storage and transportation.

OBJECTS OF THE INVENTION

[0010] With the foregoing in mind, a primary object of the present invention is to provide a building material which is capable of being readily installed in a wall or roof structure between an inner sheathing member and an outer building material and which prevents the accumulation of moisture and the growth of mold, mildew, bacteria and other fungi within the structure.

[0011] Another object of the present invention is to provide an openwork spacer material, and a method of making same, that provides a plurality of ventilation and drainage passageways and that provides for the presence of a fungicide or like agent.

[0012] A further object of the present invention is to provide a building structure and a method for assembling a building structure having an openwork spacer material therein which prevents moisture from becoming entrapped within the structure and which prevents the growth of mold, mildew, bacteria and other fungi within the structure.

SUMMARY OF THE INVENTION

[0013] More specifically, the present invention is a spacer-type building material used in the construction of building structures, such as walls and roofs. The spacer is a continuous, indeterminate-length web of material that has an openwork structure and carries an antifungal agent. Thus, when installed within a wall or roof, the openwork spacer prevents growth of mold and mildew and provides an airspace and ventilation and drainage pathways to prevent moisture from being trapped within the building structure thereby preventing deterioration of the building structure. Preferably, the openwork spacer is stored and shipped in a spiral roll and is unrolled during installation.

[0014] According to another aspect of the present invention, a method of manufacturing a spacer-type building material is provided. The method includes producing a continuous, indeterminate-length openwork web of material, dispersing an antifungal agent throughout the openwork web of material, and rolling the web of material lengthwise into a spiral roll about an imaginary central axis. In use, the spacer-type building material is unrolled and installed within a building structure, prevents the growth of mold and mildew, and provides an airspace and ventilation and drainage pathways for preventing moisture from being trapped within the building structure and from deteriorating the building structure.

[0015] According to still another aspect of the present invention, a method of assembling a building structure is provided. A spiral roll of an elongate web of an openwork material is provided adjacent the inner sheathing of a building structure. The web of openwork material is unrolled and placed along the inner sheathing, and an outer building material is installed relative to the inner sheathing such that a layer of openwork material is sandwiched between the inner sheathing and the outer building material. The openwork material provides an airspace and ventilation and drainage pathways within the building structure to prevent moisture from becoming trapped within the building structure thereby preventing premature deterioration of the building structure, and the openwork material carries an antifungal agent to prevent growth of mold and mildew within the building structure.

[0016] According to yet another aspect of the present invention, a building structure is provided having drainage passageways and air spaces therein to prevent moisture from being trapped and to retard deterioration. To this end, the building structure includes an inner sheathing member, an outer building material, and an elongate web of openwork material located between the inner sheathing member and the outer building material. In addition to providing ventilation and drainage passageways and air spaces within the building structure, the openwork material also carries an antifungal agent to prevent growth of mold and mildew within the building structure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The foregoing and other objects, features and advantages of the present invention should become apparent from the following description when taken in conjunction with the accompanying drawings, in which:

[0018] FIG. 1 is an elevational view of a first embodiment of a portion of an openwork spacer according to the present invention;

[0019] FIG. 2 is a perspective view of a wall constructed with the spacer of FIG. 1 according to the present invention;

[0020] FIG. 3 is a cross-sectional view of the sidewall illustrated in FIG. 2 taken along a plane parallel to the horizontal;

[0021] FIG. 4 is a perspective view of a spiral roll of the spacer illustrated in FIG. 1;

[0022] FIG. 5 is a cross-sectional view of a roof constructed with the spacer of FIG. 1 according to the present invention;

[0023] FIG. 6 is a perspective view of a wall constructed with a second embodiment of a spacer according to the present invention;

[0024] FIG. 7 is a perspective view of a spiral roll of the spacer illustrated in FIG. 6;

[0025] FIG. 8 is a perspective view of a portion of the openwork spacer illustrated in FIG. 6;

[0026] FIG. 9 is a cross-sectional view of the openwork spacer illustrated in FIG. 6;

[0027] FIG. 10 is a cross-sectional view of a third embodiment of an openwork spacer having a fabric material attached thereto; and

[0028] FIG. 11 is a cross-sectional view of fourth embodiment of an openwork spacer constructed of sheet of house wrap material having a plurality of beads adhered thereto at spaced-apart locations.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0029] Referring now to the drawings, FIG. 2 illustrates a wall 10 of a building assembled with a spacer 12, FIG. 5
illustrates a roof 14 of a building assembled with the spacer 12, and FIG. 6 illustrates another wall 16 of a building assembled with an alternate spacer 18. The installed spacers, 12 and 18, provide ventilation and drainage passageways which enables the free flow of air, vapor and liquids within the wall/roof to ensure that moisture is prevented from accumulating in spaces within the wall/roof. In addition, the spacers, 12 and 18, carry an antifungal agent, fungicide or the like which provides an additional preventive means for retarding, and/or substantially eliminating, the growth of mold, mildew, bacteria and/or other fungi within the wall/roof.

[0030] The structure of the openwork spacer according to the present invention provides a plurality of ventilation and drainage paths so that liquid moisture is permitted to descend within the wall/roof under the force of gravity to an exit provided at the base of the wall/roof and so that a ventilation air flow can pass within the wall/roof to evaporate condensation and other moisture and remove moisture vapor. The specific structure of the openwork spacer can vary as illustrated in the drawings and as discussed below with respect to specific examples. Preferably, the openwork spacer is lightweight, made of minimum of material, and yet is capable of providing an elastically compressible building material that has a suitable compression strength to operate in about a 100 to about a 200 pounds per square foot (psf) environment. For instance, the spacer preferably should compress no more than about 30% of its original manufactured thickness when it is subjected to 100 to 200 psf of pressure. In addition, preferably the openwork spacer is provided in a roll-form as illustrated in FIGS. 4 and 7 to enable efficient storage and transportation.

[0031] An important aspect of the present invention is that the spacer carries an antifungal agent, fungicide or the like which prevents the growth of mold, mildew, bacteria and/or other fungi within the wall/roof. Several advantages are provided by such a building material and its use as a carrier of a fungicide. Preferably, the spacer is supplied to the construction site already carrying the fungicide, and the step of installing the spacer simultaneously also accomplishes the step of applying a fungicide within a wall/roof. This eliminates the need to handle fungicide chemicals at the construction site and to apply the fungicide, such as by spraying a liquid fungicide, during construction of the wall/roof. In addition, the spacer can be manufactured such that the fungicide is uniformly dispersed throughout the spacer to ensure that the fungicide is uniformly present throughout a constructed wall/roof including adjacent both an inner sheathing member and an outer building material. Further, if a fungicide is sprayed onto the openwork spacer post-installation, the plurality of drainage/ventilation openings provide the fungicide with numerous locations to adhere so that the fungicide does not merely runoff the sprayed structure.

[0032] The antifungal agent, or fungicide, can be applied to the spacer in various manners. For example, the fungicide can be mixed with a raw material utilized to form the spacer. To this end, a fungicide can be added to a molten plastic resin material such that, in the final product, the fungicide exists throughout the material utilized to manufacture the spacer. Alternatively, the fungicide can be coated on fibers or the like utilized to the make the spacer product. Still further, the fungicide can be applied as a coating by spraying or dipping the spacer during or after manufacture of the spacer. The fungicide can also be applied to the spacer at a building site either shortly before or after installation of the spacer within the wall/roof.

[0033] By way of example, and not be way of limitation, FIGS. 1-5 disclose an openwork building material, or spacer, 12 provided as an elongate, corrugated openwork mat of randomly convoluted polymeric filaments. To this end, the spacer 12 is made of a thin layer of randomly convoluted polymeric filaments that is shaped into a corrugated form during manufacture to provide a corrugated openwork mat having a relatively significant thickness "T" despite containing very little material, i.e., polymeric filaments. A fungicide is evenly dispersed and provided within the filaments or on the filaments, or alternatively is applied as a coating on the finished spacer 12. As illustrated in FIG. 4, the spacer 12 is conveniently and efficiently stored and transported in roll-form in which the spacer 12 is rolled in a spiral about an imaginary central axis "A".

[0034] The wall 10 illustrated in FIGS. 2 and 3 includes an upright planar inner sheathing member 20 which is affixed to support posts 22. The inner sheathing member 20 is typically formed of panels of plywood, panels of oriented strand board, panels of particle board, an insulated concrete wall, or other materials permitted by local building codes. In some instances, the inner sheathing member 20 is lined with a membrane (not shown), such as a one-way vapor permeable house-wrap. Examples of other membranes include asphalt impregnated felt and building paper.

[0035] During construction, the spacer 12 is unrolled laterally on the inner sheathing member 20 and/or membrane, and thereafter, an outer building material 24 is secured a spaced distance from the inner sheathing member 20 such that it overlies the spacer 12 and sandwiches the spacer 12 between the inner sheathing member 20 and the outer building material 24. The outer building material 24 can be, for instance, a siding material such as a wood or fiber-cement siding product. Of course, other outer building materials can also be utilized, such as, brick, vinyl materials, stucco, exterior insulation finish systems (EIFS), shingles, or any other siding and/or cladding material.

[0036] Any moisture which collects on the surface of either the inner sheathing member 20 or membrane, and the outer building material 24 adjacent the spacer 12 is provided with a free unobstructed path to drain downwardly and out of the wall 10. The multitude of passageways formed in the openwork mat of spacer 12 enable the free circulation of air between the inner sheathing member 20 and outer building material 24 and aid in the drying, or evaporation, of any moisture which is present within the wall 10. Further, since a fungicide is evenly distributed on and carried by the spacer 12, and since a layer of the spacer 12 extends throughout the entire wall space, mold and mildew are prevented from growing anywhere within the wall 10.

[0037] As illustrated in FIG. 5, the spacer 12 according to the present invention can also be utilized in roof constructions to provide the same functions as that disclosed above for wall 10. The inclined roof 14 includes an inner sheathing member, in this case a deck member, 26 which is affixed to rafters 28. The deck member 26 is typically made of plywood, particle board or other materials permitted by local building codes and is typically lined with a membrane, in
this case a layer of roofing felt (not shown). During assembly of the roof 14, the spacer product 12 is unrolled lengthwise over the roofing felt and is secured to the deck member 26 with nails, staples, adhesives or the like. Thereafter, an outer building material 30 is affixed to the deck member 26 such that it overlies the spacer 12. As illustrated, the outer building material 30 is wooden shingles, such as cedar shakes. Of course, other building materials can also be utilized, such as, metal, asphalt, tile, rubber or slate roofing materials.

[0038] Another example of an openwork building material is disclosed in FIGS. 6-9 which disclose a spacer 18 constructed from a solid sheet of thermoplastic material. The thermoplastic material can be, for instance, high impact poly styrene (HIPS), ABS, high-density polyethylene (HDPE), high-density polypropylene (HDPP), PVC, or a blend of any of these suitable polymers and can be shaped by thermoforming, vacuum stamping, or any other suitable technique. Preferably, the material is provided with hollow spacer elements 32 formed in opposite faces, 34 and 36, of the spacer 18 to provide a plurality of ventilation/drainage passageways adjacent the elements 32 and both faces, 34 and 36. The thermoplastic material contains a fungicide therein or is applied with a coating of the fungicide. If desired, the thermoplastic material can be perforated to provide a series of ventilation apertures 38 at predetermined spaced distances to permit a transverse path of ventilation through the otherwise solid sheet spacer 18.

[0039] The wall 16 illustrated in FIG. 6 includes an upright planar inner sheathing member 40 which is affixed to support posts 42. The inner sheathing member 40 can be lined with a membrane (not shown), such as a one-way vapor permeable house-wrap. During construction, the spacer 18 is unrolled laterally on the inner sheathing member 40 and/or membrane, and thereafter, an outer building material 44 is secured a spaced distance from the inner sheathing member 40 such that it overlies the spacer 18 and sandwiches the spacer 18 between the inner sheathing member 40 and the outer building material 44.

[0040] Any moisture which collects on the surface of either the inner sheathing member 40 or membrane, and the outer building material 44 adjacent the spacer 18 is provided with a free unobstructed path to drain downwardly and out of the wall 16. The multitude of passageways formed in the spacer 18 enable the free circulation of air between the inner sheathing member 40 and outer building material 44 and aid in the drying, or evaporation, of any moisture which is present within the wall 16. Further, since a fungicide is evenly distributed on and carried by the spacer 18, and since a layer of the spacer 18 extends throughout the entire wall space, mold and mildew are prevented from growing anywhere within the wall 16.

[0041] Another example of an openwork building material according to the present invention is illustrated in FIG. 10 and includes a mat 46 made of randomly convoluted filaments formed with projections, or hollow spacing elements, 48 which provide the mat 46 with a waffle-like appearance. If desired, a fabric material 50 can be adhered to at least one side of the mat 46 for strengthening and reinforcing the mat 46 and for preventing undesired collapse of the elements 48. Alternatively, a planar mat (not shown) of randomly convoluted filaments of a given thickness can be utilized such as that disclosed in U.S. Pat. No. 5,099,627 issued to Coulton et al. and assigned to Benjamin Obdyke, Inc. Yet another alternative includes a corrugated thermoplastic sheet spacer (not shown).

[0042] FIG. 11 illustrates an additional example of a spacer according to the present invention. It is constructed as a membrane 52 having a plurality of spacer beads 54 adhered thereto at spaced intervals. The membrane 52 can be a one-way vapor permeable house-wrap, a roofing felt, an asphalt impregnated felt, a building paper or the like. The fungicide can be carried by the membrane 52, beads 54, or both.

[0043] According to another aspect of the present invention, a method of making an openwork building material is provided. To this end, a continuous, indeterminate-length openwork web of material which has a plurality of ventilation and drainage passageways is manufactured. For example, a matting of polymeric filaments can be made by extruding semi-molten plastic filaments onto a profile of the desired spacer and then by permitting the plastic filaments to harden. Alternatively, a sheet of thermoplastic material can be thermoformed, or vacuum thermoformed, into a desired openwork configuration. Alternatively, a membrane material can be extruded and applied with spacer beads.

[0044] A fungicide is evenly dispersed throughout the openwork web of material so that the openwork web of material functions as a carrier of the fungicide. In the preferred embodiments, the openwork web of material is pre-loaded with the fungicide so that it carries the fungicide before it is shipped to a building site. For example, a fungicide can be added to a raw material utilized to make the openwork web of material before the openwork web of material is manufactured. Alternatively, the material can be coated with a fungicide at any time before, during, or after the manufacture of the openwork web of material. Yet another alternative includes applying the fungicide to the openwork material at the building site before, or after, installation of the openwork material in a building structure.

[0045] After the web of openwork material is manufactured, and before or after the fungicide has been applied, the web of material is preferably rolled lengthwise into a spiral roll about an imaginary central axis. This facilitates handling, storing and shipping of the material. In use, the openwork web of material is unrolled and installed within a building structure to provide an airspace and ventilation and drainage pathways for preventing moisture from being trapped within the building structure. The openwork web of material also functions as a carrier for the fungicide thereby preventing mold and mildew growth in the building structure.

[0046] Thus, the above-described spacer, building structure, and method of assembling a building structure according to the present invention provides a cost effective and efficient means for preventing premature deterioration of building structures and for preventing the growth of mold and mildew therein.

[0047] While a preferred spacer and method of making same, building structure, and method of assembly have been described in detail, various modifications, alterations, and changes may be made without departing from the spirit and scope of the spacer, building structure, and method of assembly according to the present invention as defined in the appended claims.
1. A building material spacer for use in constructing a building structure, comprising:

a continuous, indeterminate-length web of material stor-able as a spiral roll rolled lengthwise about an imaginary central axis and unrollable lengthwise during installation;

said material having an openwork structure which, when installed within a building structure, provides an air- space and ventilation and drainage pathways therein for preventing moisture from being trapped within the building structure and for thereby preventing deteriora- tion of the building structure; and

said material carrying an antifungal agent to prevent growth of mold and mildew within a building structure when installed therein.

2. A spacer according to claim 1, wherein said antifungal agent is substantially evenly dispersed throughout the length of the web of material.

3. A spacer according to claim 2, wherein said antifungal agent is carried and embedded within said material.

4. A spacer according to claim 2, wherein said antifungal agent is carried as a coating on said material.

5. A spacer according to claim 1, wherein said web of material is elastically compressible and has a compression strength sufficient to withstand at least about 200 pounds per square foot (psf) of pressure.

6. A spacer according to claim 1, wherein said openwork structure is made of a mat of randomly convoluted polymeric filaments.

7. A spacer according to claim 1, wherein said material is corrugated.

8. A spacer according to claim 1, wherein said material has a front and rear face and a plurality of hollow projections extending outwardly from at least one of said faces.

9. A spacer according to claim 1, wherein a fabric material is secured to one of said faces of said web of material to reinforce said web of material.

10. A spacer according to claim 1, wherein said material is made of a web of a thermoformable plastic sheet material.

11. A spacer according to claim 10, wherein said thermoformable plastic sheet material has a series of apertures providing transverse passageways.

12. A spacer according to claim 1, wherein said web of material is made of a house wrap material having a plurality of dimple spacing elements projecting transversely from at least one face thereof.

13. A method of manufacturing a spacer building material, comprising the steps of:

producing a continuous, indeterminate-length openwork web of material;

dispersing an antifungal agent throughout said openwork web of material; and

rolling said web of material lengthwise into a spiral roll about an imaginary central axis;

whereby, in use, said spacer building material is unrolled and installed within a building structure to prevent growth of mold and mildew and to provide an airspace and ventilation and drainage pathways for preventing moisture from being trapped within the building structure and from deteriorating the building structure.

14. A method according to claim 13, wherein said anti-fungal agent is dispersed substantially evenly throughout said openwork web of material.

15. A method according to claim 13, further comprising the step of adding said antifungal agent to a material utilized to make said openwork web of material before said step of producing said openwork web of material.

16. A method according to claim 13, further comprising the step of applying said antifungal agent onto said openwork web of material after said step of producing said openwork web of material.

17. A method according to claim 16, wherein said step of applying said antifungal agent is accomplished before said step of rolling said web of material.

18. A method of assembling a building structure, comprising the steps of:

providing a spiral roll of an elongate web of an openwork material adjacent an inner sheathing of a building structure;

unrolling and placing said web along said inner sheathing; and

installing an outer building material relative to said inner sheathing such that said openwork material is sandwiched between said inner sheathing and said outer building material;

said openwork material providing an airspace and ventilation and drainage pathways within the building structure to prevent moisture from being trapped within the building structure and to thereby prevent deterioration of the building structure; and

said openwork material carrying an antifungal agent to prevent growth of mold and mildew within the building structure.

19. A method according to claim 18, wherein said antifungal agent is applied to and carried by said openwork material before said step of unrolling said spiral roll of said web of openwork material such that said step of placing said web of openwork material along said inner sheathing also accomplishes a step of applying an antifungal agent within the building structure.

20. A method according to claim 18, further comprising the step of applying said antifungal agent to said openwork material after said unrolling step.

21. A method according to claim 18, further comprising the step of securing a membrane to said inner sheathing before placing said web along said inner sheathing, wherein said membrane is selected from the group consisting of a housewrap material, an asphalt impregnated felt, a building paper, a roofing felt, and a vapor permeable membrane that permits moisture to exit through the building structure and blocks moisture from entering through the building structure.

22. A method according to claim 36, wherein said outer building material is selected from the group consisting of wood, brick, metal, fiber cement, vinyl siding material, stucco, shingles, cladding materials and exterior insulation finish systems (EIFS).
23. A building structure having drainage passageways and air spaces therein to prevent moisture from being trapped within the building structure and to retard deterioration of the building structure, comprising:

an inner sheathing member;

an outer building material; and

an elongate web of openwork material located between said inner sheathing member and said outer building material for providing drainage passageways and air spaces therein to prevent moisture from being trapped between said inner sheathing member and said outer building material;

said openwork material carrying an antifungal agent to prevent growth of mold and mildew within the building structure.

24. A spacer according to claim 23, wherein said antifungal agent is substantially evenly dispersed throughout the length of said web of openwork material.

25. A spacer according to claim 23, wherein said antifungal agent is dispersed within said web of openwork material.

26. A spacer according to claim 23, wherein said antifungal agent is coated on said web of openwork material.

27. A building structure according to claim 23, wherein the building structure forms a wall of a building.

28. A building structure according to claim 23, wherein the building structure forms a roof of a building.

29. A building structure according to claim 23, further comprising a membrane located between said inner sheathing member and said web of openwork material, and wherein said membrane is selected from the group consisting of a housewrap material, an asphalt impregnated felt, a building paper, a roofing felt, and a vapor permeable membrane that permits moisture to exit through the building structure and blocks moisture from entering through the building structure.

30. A building structure according to claim 23, wherein said outer building material is selected from the group consisting of wood, brick, metal, fiber cement, vinyl siding material, stucco, shingles, cladding materials and exterior insulation finish systems (EIFS).