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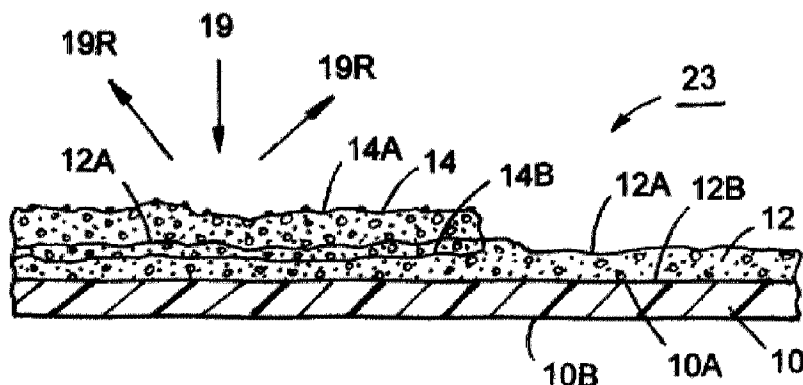
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(54) **Titre :** MEMBRANE EN FEUILLE D'IMPERMEABILISATION DES SOUS-FONDACTIONS ET DES COTES CACHES AVEC UNE COUCHE DE PARTICULES GRANULAIRES ADHESIVES ET HAUTEMENT REFLECHISSANTES POUR UNE LIAISON COMPLETE A DU BETON OU DE LA GUNITE, ET METHODE DE FABRICATION ET D'UTILISATION

(54) **Title:** BELOW GRADE, BLIND SIDE, WATERPROOFING SHEET MEMBRANE WITH ADHESIVE AND HIGH REFLECTIVITY GRANULAR PARTICLE LAYER TO FULLY BOND TO CONCRETE/SHOTCRETE, AND A METHOD OF MAKING, AND USING SAME



(57) **Abrégé/Abstract:**

The invention relates to a below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer, and having a top release liner, and a bottom release liner, enhancing bond strength between sheets, and be able to fully bond to concrete/shotcrete, and a method of making, and using same. The inventive waterproofing sheet membrane with adhesive, has at least one layer of high reflectivity granular particle layer that are fully or partly embedded into the adhesive layer, and where the average reflectivity of the exposed granular particles is between about 35 percent to 80 percent reflectivity on a standard reflectivity scale. The waterproofing sheet membrane has an adhesive layer having embedded therein high reflectivity granular particles is used in any building or wall construction, and can be placed under or around a foundation of a building or on its below grade blind side retaining walls, etc.

## **ABSTRACT OF THE DISCLOSURE**

The invention relates to a below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer, and having a top release liner, and a bottom release liner, enhancing bond strength between sheets, and be able to fully bond to concrete/shotcrete, and a method of making, and using same. The inventive waterproofing sheet membrane with adhesive, has at least one layer of high reflectivity granular particle layer that are fully or partly embedded into the adhesive layer, and where the average reflectivity of the exposed granular particles is between about 35 percent to 80 percent reflectivity on a standard reflectivity scale. The waterproofing sheet membrane has an adhesive layer having embedded therein high reflectivity granular particles is used in any building or wall construction, and can be placed under or around a foundation of a building or on its below grade blind side retaining walls, etc.

**BELOW GRADE, BLIND SIDE, WATERPROOFING SHEET MEMBRANE  
WITH ADHESIVE AND HIGH REFLECTIVITY GRANULAR PARTICLE  
LAYER TO FULLY BOND TO CONCRETE/SHOTCRETE, AND A METHOD  
OF MAKING, AND USING SAME**

**CROSS-REFERENCE TO RELATED APPLICATION**

[0001] The instant patent application claims priority to and the benefit of pending U.S. Provisional Patent Application Serial Number 62/958,170, filed on January 7, 2020, titled “Below Grade, Blind Side, Waterproofing Sheet Membrane With Adhesive And High Reflectivity Granular Particle Layer To Fully Bond To Concrete/Shotcrete, And A Method Of Making, And Using Same”.

**FIELD OF THE INVENTION**

[0002] The present invention relates generally to a below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer, and having a top liner along one top edge, and a bottom liner along the opposite bottom edge, to fully bond to concrete/shotcrete, and a method of making, and using same. More particularly, the invention encompasses a below grade, blind side, waterproofing sheet membrane with adhesive, and having at least one layer of high reflectivity granular particle layer that are fully or partly embedded into the adhesive layer, and where the average reflectivity of the exposed granular particles is between about 45 percent to 80 percent reflectivity on a standard reflectivity scale. The waterproofing sheet membrane has an adhesive layer having embedded therein high reflectivity granular particles is used in any building or wall construction, and can be placed under or around a foundation of a building or on its below grade blind side retaining walls, etc. The innovative high reflectivity granular particle layer system that is securely bonded to concrete or shotcrete can be used along a wall, a floor, a ceiling, or along any structure which requires water or moisture proofing. The invention can be most effectively used between a concrete or shotcrete layer and the surrounding earth, such as, along an area that has a high water table, or a constant hydrostatic pressure, or high ground moisture, that may creep into a foundation or a wall.

## **BACKGROUND INFORMATION**

[0003] Water or moisture penetration into a structure has have been known in the water proofing industry for many years, and the water proofing industry has addressed this well-known problem in a variety of ways, and which are well known to the people skilled in the art.

[0004] US Patent No. 8,453,405, to Robert A. Wiercinski, et al. discloses a waterproofing membrane that bonds to concrete cast against it (i.e., post-cast concrete). The membrane includes a flexible carrier sheet, a pressure sensitive adhesive and reflective particles on the surface of the adhesive. The reflective particles should have an average diameter equal to or greater than the thickness of the pressure sensitive adhesive. Preferably, the reflective particles are ground white cement, ground hydrated white cement, ground partially-hydrated white cement or a mixture of two or more of these. The membrane does not have a removable release sheet that is typically used to prevent the adhesive portion of the membrane from adhering to the carrier sheet or other portion of the membrane when the membrane is rolled up.

[0005] US Patent No. 8,713,879, to Robert A. Wiercinski, et al. discloses a waterproofing membrane that bonds to concrete cast against it (i.e., post-cast concrete). The membrane includes a flexible carrier sheet, a pressure sensitive adhesive, and reflective particles on the surface of the adhesive. The reflective particles should have an average diameter equal to or greater than the thickness of the pressure sensitive adhesive. Preferably, the reflective particles are ground white cement or ground white hydrated cement. The membrane does not have a removable release sheet that is typically used to prevent the adhesive portion of the membrane from adhering to the carrier sheet or other portion of the membrane when the membrane is rolled up.

[0006] US Patent No. 8,793,862 to Ulrich K. Weber, et al. discloses a sealant which is arranged in a meshlike manner between a composite layer and a barrier layer in a water-tight membrane that includes a barrier layer and a composite layer. In the case of a leak in the barrier layer, the network of sealant between the composite layer and the barrier layer prevents the barrier layer from being affected. As a result, the size of the

areas affected by penetrating water is limited. The damage by the penetrating water is thus limited to a smaller area, and the point of damage can thus be more easily localized.

[0007] US Patent No. 10,655,322, to Huhe Chen, et al. discloses a waterproofing membrane which does not require a removable release sheet but which nevertheless bonds to post-cast concrete and facilitates water-tight sealing at membrane-to-membrane overlaps. The waterproofing membrane comprises a carrier and pressure-sensitive adhesive (PSA) layers, an inorganic particle layer having particulate bodies which are partially embedded in the PSA and which have an average particle size less than the average thickness of the PSA layer, and an anti-submarining nano-silica-containing coating layer attached to un-embedded portions of the inorganic particles to prevent total embedding into the PSA when the membrane is rolled or unrolled, whereby water-tight seams are facilitated between overlapped portions of adjacently installed waterproofing membranes, and whereby the water-tight seam is achieved preferably using only detailing or waterproofing tape and without the additional use of a liquid primer, mastic, or other coating.

[0008] However, this invention improves on the deficiencies of the prior art and provides an inventive below grade, blind side, waterproofing sheet membrane with adhesive

and high reflectivity granular particle layer to fully bond to concrete/shotcrete, and a method of making, and using same.

**PURPOSES AND SUMMARY OF THE INVENTION**

[0009] The invention is a novel below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete, and a method of making, and using same.

[0010] Therefore, one purpose of this invention is to provide an inventive waterproofing layer having a waterproofing sheet membrane, and an adhesive layer having embedded therein and having high reflectivity granular particles embedded therein.

[0011] Another purpose of this invention is to provide a novel below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete, and a method of making, and using same, and wherein reflectivity of the at least one layer of at least one high reflectivity granular particle layer is between about 45 percent reflectivity to about 80 percent reflectivity.

[0012] Yet another purpose of this invention is to provide a novel below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete, and a method of making, and using same, and wherein the inventive waterproofing layer having a waterproofing sheet membrane, and an adhesive layer having embedded therein and having high reflectivity granular particles embedded therein has dual release liners or sheets protecting at least one first adhesive layer, and at least one second adhesive layer.

[0013] Still yet another purpose of this invention is to provide a novel below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete, and a method of making, and using same,

and wherein the inventive waterproofing layer having a waterproofing sheet membrane, and an adhesive layer having embedded therein and having high reflectivity granular particles embedded therein has dual release liners or sheets protecting at least one first adhesive layer, and at least one second adhesive layer, and where a first release liner or sheet protects the first adhesive layer which is on the first or top or upper portion of the inventive waterproofing layer having a waterproofing sheet membrane, and an adhesive layer having embedded therein and having high reflectivity granular particles embedded therein, and a second release liner or sheet protects the second adhesive layer which is on the second or bottom or lower portion of the inventive waterproofing layer having a waterproofing sheet membrane, and wherein the first release liner is along a first edge of the inventive waterproofing layer, and the second release liner is along a second edge of the inventive waterproofing layer, and wherein the first release liner and the second release liner are at the opposite edges of the inventive waterproofing layer, and also on the opposite sides.

[0014] Still yet another purpose of this invention is to provide at least one waterproof barrier layer having high reflectivity granular particles embedded therein via at least one adhesive to form a bond with a concrete or shotcrete layer.

[0015] Therefore, in one aspect this invention comprises a method of making a below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete, comprising the steps of:

- (a) forming a sheet having a first surface and a second surface;
- (b) moving said sheet to at least one charging station, and applying a charge to said first surface and said second surface of said sheet using at least one ground wire along said first surface of said sheet, and at least one high voltage wire along said second surface of said sheet to form a charged sheet;
- (c) moving said charged sheet to at least one adhesive station, and applying at least one first adhesive layer along said first surface of said sheet, and applying at least one

second adhesive layer along at least a portion of said second surface of said sheet, to form a sheet with at least one adhesive layer;

(d) moving said sheet with at least one adhesive layer to at least one particle application station, and applying at least one layer of at least one high reflectivity granular particle layer along at least a portion of said at least one first adhesive layer, to form a waterproofing sheet membrane having at least one adhesive layer, and having at least one high reflectivity granular particle layer.

[0016] In another aspect this invention comprises a below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete, comprising:

(a) at least one sheet membrane having a first membrane surface, and a second membrane surface;

(b) at least one first adhesive layer having a first adhesive surface, and a second adhesive surface, and wherein said second adhesive surface is in secure contact with at least a portion of said first membrane surface; and

(c) at least one layer of at least one high reflectivity granular particle layer, having a first particle layer surface, and a second particle layer surface, and wherein said second particle layer surface is in secure contact with at least a portion of said first adhesive surface, and wherein reflectivity of said at least one layer of at least one high reflectivity granular particle layer is between about 45 percent reflectivity, to about 80 percent reflectivity.

[0017] In yet another aspect this invention comprises a method of forming a below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete, comprising the steps of:

(a) taking at least one sheet membrane having a first membrane surface, and a second membrane surface;

(b) applying at least one first adhesive layer having a first adhesive surface, and a second adhesive surface, onto said at least one sheet membrane, and wherein said second adhesive surface is in secure contact with at least a portion of said first membrane surface; and

(c) applying at least one layer of at least one high reflectivity granular particle layer, having a first particle layer surface, and a second particle layer surface, over at least a portion of said at least one first adhesive layer, and wherein said second particle layer surface is in secure contact with at least a portion of said first adhesive surface, and wherein reflectivity of said at least one layer of at least one high reflectivity granular particle layer is between about 45 percent reflectivity, to about 80 percent reflectivity.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

[0018] Figure 1, illustrates a first embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

[0019] Figure 2, illustrates a second embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

[0020] Figure 3, illustrates a third embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

[0021] Figure 4, illustrates a fourth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

[0022] Figure 5, illustrates a fifth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

[0023] Figure 6, illustrates a sixth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

[0024] Figure 7, illustrates a seventh embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

[0025] Figure 8, illustrates an eight embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

[0026] Figure 9, illustrates a ninth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

[0027] Figure 10, illustrates a tenth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

[0028] Figure 11, illustrates an eleventh embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

[0029] Figure 12, illustrates a twelfth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

[0030] Figure 13, illustrates a thirteenth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete.

### **DETAILED DESCRIPTION**

[0031] The inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete, and a method of making, and using same will now be discussed with reference to Figures 1 through 13. Although the scope of the present invention is much broader than any particular embodiment, a detailed description of the preferred embodiment follows together with drawings. These drawings are for illustration purposes only and are not drawn to scale. Like numbers represent like features and components in the drawings.

[0032] In summary the invention is a below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete, and a method of making, and using same in a building or wall construction, and placing it under and around a foundation of a building or dwelling or on its below grade blind side retaining walls, etc.

[0033] Figure 1, illustrates a first embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 23, where the sheet membrane or layer 10, having a first or top or upper surface 10A, and a second or lower or bottom surface 10B, has secured thereto at least one layer of at least one first adhesive 12, such that the first adhesive layer 12, has a first or top or upper surface 12A, and a second or lower or bottom surface 12B, and

wherein the first surface 10A, of the sheet membrane 10, is in secure contact with the second surface 12B, of the first adhesive layer 12. At least one layer of at least one high reflectivity granular particle layer 14, having a first or top or upper surface 14A, and a second or lower or bottom surface 14B, is in secure contact with the first adhesive layer 12, such that the first surface 12A, of the first adhesive layer 12, is in secure contact with the second surface 14B, of the at least one high reflectivity granular particle layer 14, and this combination forms the inventive waterproofing sheet membrane with adhesive and high reflectivity granular particle layer 23. For some applications portions of the at least one high reflectivity granular particle layer 14, could be partially or fully embedded within the at least one first adhesive layer 12. Similarly, for some applications the second surface 14B, of the at least one high reflectivity granular particle layer 14, could be below the planar surface of the first surface 12A, of the at least one first adhesive layer 12. The sheet membrane 10, can be made from a material 10, selected from a group comprising a high-density polyethylene (HDPE) material, a thermoplastic polyolefin (TPO) material, and combinations thereof, to name a few. The thickness of the sheet membrane 10, is preferably between about 1.0 mm to about 2.5 mm. As shown in Figure 1, incoming light 19, is reflected or disbursed as reflected light 19R. The at least one layer of at least one high reflectivity granular particle layer 14, can be selected from a group consisting of sand, partially hydrated cement granules, such as, for example, white cement, gray cement, a white cement that has been tinted or dyed to provide a lighter color or high reflectivity, a gray cement that has been tinted or dyed to provide a lighter color or high reflectivity, tinted granules, white sand, silica sand, quartz sand covered with a thin layer of titanium dioxide, and combinations thereof, to name a few, and where the average reflectivity of the granular particles 14, are between about 45 percent reflectivity, to about 80 percent reflectivity. For some applications the high reflectivity could be between say, about 60 percent reflectivity to say about 70 percent reflectivity, and preferably about 65 percent reflectivity. As one can appreciate that the sand particles or the granules have both smooth surfaces, and jagged surfaces, which of course would affect the average reflectivity, and thus one needs to look at the average reflectivity over the surface of the sand or granules layer. It should be understood that the average reflectivity test as used herein is an average reflectivity

test that will be conducted over the surface of the inventive membrane sheet 23, having the at least one high reflectivity granular light colored particles 14, are over it, and it is possible that there may be some variance in the location reflectivity, which would depend on where the reflectivity test of the inventive sheet membrane 23, i.e., the first or top membrane sheet surface or layer 14A, might not be, for example, uniformly colored. Thus, it is possible that in production one could have lighter and darker spots on the inventive sheet membrane 23, however, the average reflectivity of the top or upper surface 14A, should be above, for example, 35 percent, and preferably above 50 percent. For some applications the high reflectivity could be between say, about 35 percent to say about 55 percent. However, for some applications the reflectivity could be, for example, between about 35 percent reflectivity, to about 80 percent reflectivity, and more preferably say, above 45 percent reflectivity, to above 55 percent reflectivity. Another benefit of the inventive membrane sheet 23, is that by reflecting a large amount of light, it keeps the membrane cooler. Still another advantage of this invention is that it helps to reduce the expansion, and contraction of the layer or membrane 10, such as, for example, a plastic sheet membrane 10, and especially, between the cold winter, and hot summer, extremes of the weather conditions. The angle of reflection depends on how the reflection 19R, is being measured, and thus the inventor has defined an average reflectivity range, and not the method or the instrument being used to observe the high reflectivity of the high reflectivity granular particle layer 14, on the surface 14A. It should be understood that the average reflectivity test as used herein is an average reflectivity test that will be conducted over the surface having the at least one high reflectivity granular particle layer 14, on the surface 14A, of the inventive sheet membrane 23. It is possible that there may be some variance in the location reflectivity, which would depend on where the reflectivity test of the inventive sheet membrane 23, i.e., the first or top sheet surface or layer 14A, might not be, for example, uniformly covered with the high reflectivity granular particles 14, and thus it is possible that in production one could have lighter and darker spots on the inventive sheet membrane 23, however, the average reflectivity of the top or upper surface or layer 14A, should be above, for example, about 35 percent reflectivity, and preferably between about 35 percent reflectivity, to about 55 percent

reflectivity, and more preferably between about 35 percent reflectivity, to about 80 percent reflectivity.

[0034] Figure 2, illustrates a second embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 33, which is similar to the first embodiment 23, but, wherein the second surface 10B, of the sheet membrane 10, is provided with a surface 11, and wherein the surface 10B, 11, can be selected from a group comprising, smooth surface, texture surface, light texture surface, embossed surface, lightly embossed surface, undulating surface, and combinations thereof, to name a few.

[0035] Figure 3, illustrates a third embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 43, which is similar to the first embodiment 23, but, wherein a layer portion or edge portion 12C, of the first adhesive layer 12, does not have the at least one layer of at least one high reflectivity granular particle layer 14, over the first surface 12A, and where the layer portion 12C, could be covered or protected with at least one first or top removable release layer or sheet 16, which release layer or sheet 16, is removed, as needed, during installation or application of the inventive waterproofing sheet membrane with adhesive and high reflectivity granular particle layer 43. It is preferred that the layer portion 12C, is along at least one edge of the first adhesive layer 12, and preferably along a factory edge 12C, such as, a selvedge 12C.

[0036] Figure 4, illustrates a fourth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 53, which is similar to the third embodiment 43, and wherein a layer portion or edge portion 10C, of the membrane 10, has secured thereto, at least one layer of at least one second adhesive layer 22, along a portion of the second surface 10B, in the layer portion or area 10C. The second adhesive layer 22, has a first or top or

upper surface 22A, and a second or lower or bottom surface 22B. The second surface 22B, of the second adhesive layer 22, is preferably covered or protected with at least one second or bottom removable release layer or sheet 28, while the surface 22A, of the at least one second adhesive layer 22, is in secure mating contact with the second surface 10B, in the layer portion or area 10C. The at least one second release layer or sheet 28, is removed, as needed, during installation or application of the inventive waterproofing sheet membrane with adhesive and high reflectivity granular particle layer 53. It is preferred that the layer portion 10C, is along at least one edge of the membrane layer 10, and preferably along a factory edge 10C, such as, a selvage 10C.

[0037] As one can see in Figure 4, that the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 53, has a dual release liner 16, 28, comprising of a first or top or upper release liner 16, at one end or edge or portion 12C, of the inventive waterproofing sheet membrane with adhesive and high reflectivity granular particle layer 53, and a second or bottom or lower release liner 28, at the opposite end or edge or portion 10C, of the inventive waterproofing sheet membrane with adhesive and high reflectivity granular particle layer 53. This innovative configuration allows the inventive waterproofing sheet membrane with adhesive and high reflectivity granular particle layer 53, to mate with other sheet membranes 53, so as to extend the length of the sheet membranes 53, by mating one to the other as more clearly shown in Figure 5. It should also be appreciated that this innovative configuration allows the sheet membrane 53, to be installed in a moist or damp or water filled environment or under water, as the release layer 16, 28, can be removed in situ and the adhesive 12, 22, would adhere to the surface to which it is applied or mated or secured to. Thus, it should be appreciated that the adhesive 12, 22, protected by the release liner 16, 28, respectively, is a pressure sensitive adhesive (PSA) 12, 22, and would automatically adhere to the surface to which it is applied or mated to once the corresponding release liner 16, 28, is removed.

[0038] Figure 4, also illustrates that the inventive waterproofing layer 53, having a waterproofing sheet membrane, and an adhesive layer having embedded therein and having high reflectivity granular particles embedded therein 53, has dual removable release liners or sheets 16, 28, protecting a first adhesive layer 12, and a second adhesive layer 22, and where the first removable release layer or sheet 16, protects the first adhesive layer 12, which is on the first or top or upper portion 12A, of the inventive waterproofing layer 53, having a waterproofing sheet membrane, and an adhesive layer having embedded therein and having high reflectivity granular particles embedded therein 53, and a second removable release layer or sheet 28, protects the second adhesive layer 22, which is on the second or bottom or lower portion 10B, of the inventive waterproofing layer 53, having a waterproofing sheet membrane, and an adhesive layer having embedded therein and having high reflectivity granular particles embedded therein 53.

[0039] Figure 5, illustrates a fifth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 63, which is similar to the fourth embodiment 53. As shown in Figure 5, the two inventive sheets 53, comprises of a first inventive membrane sheet 53A, and a second inventive membrane sheet 53B, which are joined or mated together, so as to create a “continuous” inventive membrane sheet 53. As shown in Figure 5, one edge of the first inventive membrane sheet 53A, is secured to another edge of a second inventive membrane sheet 53B. As shown in Figure 5, the top release layer or sheet 16, of the second inventive sheet 53B, is removed so as to expose at least a portion of the first adhesive layer 12, along the layer portion or edge portion 12C, and the bottom release sheet 28, of the first inventive membrane sheet 53A, is removed so as to expose at least a portion of the second surface 22B, of the second adhesive layer 22, along the layer portion or edge portion 10C, and wherein at least a portion of the first adhesive layer 12, of the second inventive sheet 53B, is secured to at least a portion of the second adhesive layer 22, of the first inventive membrane sheet 53A, and thus creating a bond along a length or area or overlap 51.

[0040] Figure 6, illustrates a sixth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 73, where one edge of a first inventive sheet membrane 23, is secured to another edge of a second inventive sheet membrane 23. A detail strip 35, having a first or upper or top surface 35A, and a second or lower or bottom surface 35B, is used to secure at least two inventive sheet membranes 23, along a seam or gap 31. As shown in Figure 6, the two individual inventive sheet membrane 23, comprises of at least one first inventive sheet membrane 23A, and at least one second inventive sheet membrane 23B, that are joined or mated together along an edge or seam 31, so as to create a “continuous” inventive sheet membrane 23. As shown in Figure 6, a release layer or sheet (not shown) is removed from the upper surface 35A, of the detail strip 35, so as to expose at least one layer of at least one third adhesive layer 32, which has already been secured to an upper or top surface 35A, of the detail strip 35. The second surface 10B, of a first inventive sheet membrane 23A, is placed over a first adhesive portion 34, of the third adhesive layer 32, and the two surfaces are securely mated or joined each to the other creating a bond along a length or area or overlap 61. In the next step, the second surface 10B, of a second inventive sheet membrane 23B, is placed over a second adhesive portion 36, of the exposed portion of the third adhesive layer 32, and the two surfaces are securely mated or joined each to the other, similarly, creating a bond along a length or area or overlap 61. The sixth embodiment is very useful when installing the “alternative non-factory lap”. It should be appreciated that the edges of the inventive sheet membrane 23, may not be perfectly straight or aligned, and thus one could have a seam or gap 31, between the edges of the first inventive sheet membrane 23A, and the second inventive sheet membrane 23B. For some applications one could also use a pressure source 81, as shown in Figure 8, such as, for example, using a steel or rubber roller over the seam or gap 31, several time while applying significant pressure to completely and securely bond or mate the detail strip 35, to the first inventive sheet membrane or layer 23A, and to the second inventive sheet membrane or layer 23B. For some applications it is preferred that a pressure source 81, such as, for example, a steel or rubber roller 81, is rolled or passed over the lap or the joint area or seam 66, several times while

applying pressure 81, to ensure proper adhesion between the first at least one sheet membrane with adhesive layer 23A, and the second at least one sheet membrane with adhesive layer 23B, that are being joined at their respective edges. A similar pressure source 81, can also be used whenever a first inventive sheet or membrane 23A, is being mated or secured to a second inventive sheet or membrane 23B, such as, along an edge 10D, or selvedge 10D, 12C.

[0041] Figure 7, illustrates a seventh embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 83, where one portion, such as, an edge 10C, 12C, of a first inventive sheet membrane 23, is secured to another portion, such as, an edge 10C, 12C, of a second inventive sheet membrane 23. As shown in Figure 7, the two individual inventive sheet membranes 23, comprises of at least one first inventive sheet membrane 23A, and at least one second inventive sheet membrane 23B, that are joined or mated together along an edge so as to create a “continuous” inventive sheet membrane 23, 83. As shown in Figure 7, the layer portion 12C, of the first surface 12A, of the first adhesive layer 12, of the first inventive sheet membrane 23A, is exposed for securing to the second inventive sheet membrane 23B, or the second adhesive layer 22, along the surface 10B, or layer portion 10C, of the second inventive sheet membrane 23B, is exposed for securing to the second inventive sheet membrane 23B. Thus, one would take the exposed surface of the first adhesive layer 12, or the second adhesive layer 22, of the first inventive sheet membrane 23A, and secure it to a portion of the second inventive sheet membrane 23B, that does not have an exposed first adhesive layer 12, or second adhesive layer 22, such as, along an edge 10C, 12C, or selvedge 10C, 12C.

[0042] Figure 8, illustrates an eight embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 93, where one portion, such as, an edge 10C, 12C, of a first inventive sheet membrane 23, is secured to another portion, such as, an edge 10C,

12C, of a second inventive sheet membrane 23. As shown in Figure 8, the two individual inventive sheet membranes 23, comprises of at least one first inventive sheet membrane 23A, and at least one second inventive sheet membrane 23B, that are joined or mated together along an edge so as to create a “continuous” inventive sheet membrane 23, 93. As shown in Figure 8, the layer portion 12C, of the first surface 12A, of the first adhesive layer 12, of a first inventive sheet membrane 23A, has the first adhesive surface 12A, exposed, such as, by the removal of the release sheet 16, and that the second inventive sheet membrane 23B, having the second adhesive layer 22, is also exposed, such as, by the removal of the release sheet 28, and thus the exposed surface of the first adhesive layer 12, is mated with and secured to the exposed surface of the second adhesive layer 22, which results in the joining of the first inventive sheet membrane 23A, to the second inventive sheet membrane 23B, such as, along an edge 10C, 12C, or selvedge 10C, 12C. Optionally, one could also use at least one pressure source 81, such as, for example, a steel or rubber roller 81, that could be applied over the seam or gap 31, or the overlap 51, 61, several times while applying significant pressure to completely, and securely bond the first inventive sheet membrane 23A, to the second inventive sheet membrane 23B. At least one pressure source 81, can also be used whenever a first inventive sheet or membrane 23A, is being mated or secured to a second inventive sheet or membrane 23B, such as, along an edge 10D, or selvedge 10D. For some applications, such as, for example, during cold or wet weather where a first at least one inventive sheet membrane 23A, for some reason is not adhering to a second at least one inventive sheet membrane 23B, one could optionally, and gently, use at least one securing force 81, such as, for example, a heat gun 81, or a welder 81, (such as, a Liester welder), which would help improve the adhesion between the two overlapping inventive sheet membranes 23A, and 23B, such as, for example, along the overlap 51, 61. Thus, it should be understood that the at least one securing force 81, could be selected from a group comprising a roller, steel roller, a rubber roller, a plastic roller, a heat gun, a welder, and combinations thereof, to name a few.

[0043] Figure 9, illustrates a ninth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 103, where one portion, such as, an edge 10C, 12C, of a first inventive sheet membrane 23, is secured to another portion, such as, an edge 10C, 12C, of a second inventive sheet membrane 23. As shown in Figure 9, the two individual inventive sheet membranes 23, comprises of at least one first inventive sheet membrane 23A, and at least one second inventive sheet membrane 23B, that are joined or mated together along an edge so as to create a “continuous” inventive sheet membrane 23, 103. As shown in Figure 9, the first surface 12A, or the first surface 14A, of the first inventive sheet membrane 23A, has secured thereto at least one double sided tape 45, such as, for example, an Aussie Skin Double Sided tape 45. The at least one double sided tape 45, has a first or upper or top surface 45A, and a second or lower or bottom surface 45B. The second surface 10B, of the second inventive sheet membrane 23B, is placed over at least an exposed portion of the double-sided tape 45, and the two inventive sheet membranes 23A, and 23B, are mated or joined each to the other, and which results in the joining of the first inventive sheet membrane 23A, to the second inventive sheet membrane 23B, such as, along an edge 10C, 12C, or selvedge 10C, 12C, and creating an overlap 51, 61.

[0044] Figure 10, illustrates a tenth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 123. After an area 50, has been dug up or prepared for the foundation of a building 54, or a concrete floor surface 42, or a concrete wall surface 44, or a structure 54, it is recommended that the area under the floor areas 42, be either compacted, to form a compacted earth 56, or that a mud slab 56, be installed, so as to create a substantially flat horizontal or floor surface 42. It is also recommended that similar steps are also taken for the preparation of a side wall surface 44, or a blind wall surface 44, or a similar other structure 54, where the earth around the area 50, is compacted so as to create compacted or retained earth 56, or a mud slab 56, creating a substantially flat vertical or wall surface 44. For some applications it is recommended that at least one layer of a retaining

means 17, or a soil retention system 17, such as, for example, wood lagging 17, be installed along the exposed surface or face of the compacted or retained earth 56, or the mud slab 56. For a blind side wall surface 44, a soil retention system 17, could also be installed, such as, for example, using wood lagging 17, soil cement 17, etc. It should be appreciated that a soil retention system 17, helps in holding back the compacted earth or dirt 56, from coming down due to, for example, gravity. The soil retention system 17, also helps in creating a substantially uniform vertical wall surface 44, for the concrete wall 15. Optionally, for some applications, if needed, one could also place at least one drain board 18, (such as, for example, AVM Drain Board 6000), or at least one foam layer 18, or at least one polystyrene insulation board 18, or any other protection media 18, as required, along the exposed surface or face of the wood lagging 17. The next step is to apply or secure at least one layer of the inventive membrane sheet 23, such as, for example, Aussie Skin 550, Aussie Skin 560, against the open face or wall surface of the retaining means 17, or drain board 18, or foam layer 18, (if used) or over or against the compacted earth 56, or mud slab 56, or waist slab 56, or the soil retention system 17. It should be understood that the second surface 10B, of the sheet membrane or layer 10, would be secured to the open face of the wood lagging 17, or drain board 18, or foam layer 18, (if used) or over or against the compacted earth 56, or mud slab 56, or waist slab 56, or the soil retention system 17, and the first surface 14A, of the at least one layer of at least one high reflectivity granular particle layer 14, would be used to secure or apply the concrete / shotcrete 13, 15. The inventive sheet waterproofing membrane or layer 23, usually comes in sheets 23, or rolls 23, which are then hung onto the exposed face of the wood lagging 17, or drain board 18, or foam layer 18, (if used), using at least one securing means, such as, nails, screws, bolt, anchor, adhesive material, and combinations thereof, to name a few. The inventive sheet waterproofing layer 23, that is installed along the surface of the wall 15, may terminate at the wall-to-floor corner 21, or be returned or extend several inches along the floor 13, such as, for example, say about 12 inches along the floor 13, and creating at least one sheet waterproofing layer extension, or for some applications it could extend along the whole floor surface or floor 13. The inventive membrane or layer 23, may not need to be secured to the floor 13, at all and simply be laid on the ground or floor

13, and then one would use gravity to hold the layer or sheet membrane 23, in place. For most applications the floor 13, is cast first, and then the stem wall 44, is cast next. In addition, generally if the floor 13, requires waterproofing then the inventive membrane 23, is installed horizontally first, and extended up to the wall 14, usually a minimum of one foot above the cold joint 21, which joint 21, is between the vertical wall 44, and the horizontal slab 13. The waterproofing is then extended up the vertical wall 44 and once installed, the concrete or shotcrete 15, is then cast or formed against the installed inventive membrane 23. The concrete wall 15, or concrete floor 13, that is formed over the inventive sheet membrane 23, is such that the exposed side of the concrete wall 15, or floor 13, forms the interior wall 40, or the exterior wall 40, or interior floor 40, or exterior floor 40, or a ceiling 40, (not shown), of the structure 54, or building 54. The concrete slab 13, 15, or barrier 13, 15, for the foundation of the structure 54, or floor 13, or wall 15, or building 54, is preferably a concrete or shotcrete slab or floor 13, and/or a concrete or shotcrete wall 15. The inventive membrane waterproofing system 23, prevents the water 48, or moisture 48, or hydrostatic pressure 48, from penetrating into the concrete/shotcrete floor 13 or concrete/shotcrete wall 15, from around a water table 48, or moisture 48, or hydrostatic pressure 48, thus keeping the floor surface 42, or the wall surface 44, or ceiling (not shown) completely dry, even though the area 50, around the structure 54, has water 48, or moisture 48, or hydrostatic pressure 48. The inventive membrane waterproofing system 23, comprises essentially of at least one inventive sheet membrane 23, which allows for a waterproofing of the area or regions that needs waterproofing or moisture proofing. For some applications, one could also provide the floor 13, wall 15, joining location with at least one water-stop 38, such as, for example, an Aussie swell water-stop 38.

[0045] Figure 11, illustrates an eleventh embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 133. The structure of Figure 11, is similar to the structure of Figure 10, except that a concrete or a shotcrete retaining wall 27, has been installed instead of a wood lagging 17, between the retained earth 56, and the optional

insulation board 18, or the drain board 18, and the inventive sheet waterproofing membrane 23. For some applications the concrete or a shotcrete retaining wall 27, 15, could contain at least one metal wire mesh, which is embedded within the shotcrete/concrete 27, 15. The concrete or a shotcrete retaining wall 27, 15, can also be reinforced, using at least one reinforcing means 47, such as, for example, steel rods 47, steel mesh 47, rebar 47, fibers 47, wire mesh 47, and combinations thereof, to name a few. For some applications the sprayed concrete 13, 15, or shotcrete 13, 15, is typically reinforced by conventional securing means 47, such as, for example, steel rods 47, steel mesh 47, fibers 47, and combinations thereof, or, for example, a rebar cage 47.

[0046] Figure 12, illustrates a twelfth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 143. The structure of Figure 12, is similar to the structure of Figure 10, except that another soil retention system 37, is being shown instead of a wood lagging 17, between the retained earth 56, and the optional insulation board 18, or the drain board 18, and the inventive sheet waterproofing membrane 23. The other soil retention system 37, could be any of the other typical soil retention systems 37, such as, for example, lagging retention systems, soil/cement retention systems, shot-crete retention systems, concrete retention systems, using shot-crete or concrete to create thin temporary walls retention systems, plywood retention systems, pylons retention systems, caissons retention systems, sheet-metal piles retention systems, diaphragm wall retention systems, and combinations thereof, to name a few. For some applications, such as, for example, a blind side wall 15, a soil retention system 37, may be needed to be installed, such as, for example, using wood lagging 37, a soil cement 37, a metal wire mesh embedded in concrete 37, to name a few. It should be appreciated that a soil retention system 37, helps in holding back the compacted earth or dirt 56, from coming down due to, for example, gravity. The soil retention system 37, also helps in creating a substantially uniform vertical wall surface 44.

[0047] Figure 13, illustrates a thirteenth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 100. A manufacturing machine 70, is used to make a raw sheet 151, having a first or top or upper surface 87, and a second or bottom or lower surface 77, comprising of at least one sheet membrane or layer 20, having a first or top or upper surface 20A, and a second or bottom or lower surface 20B. The raw sheet 151, is then passed onto at least one charging station 72, where an electrical operation is performed on the raw sheet 151. Typically, the charging station 72, has at least one ground wire or roller 85, on one side of the raw sheet 151, such as, on the top side 87, and at least one high voltage wire 75, on the opposite side, such as, on the bottom side 77, however, for some applications the positioning of the at least one ground wire or roller 85, and at least one high voltage wire 75, could easily be reversed, that is one could be above the raw sheet 20, 151, and the other below the raw sheet 20, 151. The charging station 72, subjects the raw sheet 151, to high voltage so as to change the characteristics of the at least one sheet membrane or layer 20, into a sheet membrane or layer 10, having a first or top or upper surface 10A, and a second or bottom or lower surface 10B, and this process converts the raw sheet 151, into a processed or charged sheet 152. The charged sheet 152, is then moved to at least one adhesive station 74, where at least one layer of a first adhesive 12, is applied on the top or upper surface 10A, so as to form at least one first adhesive layer 12, having a first or top or upper surface 12A, and a second or bottom or lower surface 12B, where the lower surface 12B, is in secure and direct contact with the upper surface 10A, of the sheet membrane 10, and forming an adhesive formed layer 154. For some applications one could also have a process of applying at least one second adhesive 22, at the adhesive station 74. The second adhesive 22, is applied on the bottom or lower surface 10B, so as to form at least one second adhesive layer 22, having a first or top or upper surface 22A, and a second or bottom or lower surface 22B, where the upper surface 22A, is in secure and direct contact with the lower surface 10B, of the sheet membrane 10, and forming an adhesive formed layer 154. For some applications the second adhesive layer 22, is preferably formed along an edge 10C, of the sheet membrane 10. The adhesive formed layer 154, is then moved to at least one

particle application station 76, where at least one layer of a high reflectivity granular particle layer 14, is formed on top of the adhesive layer 12, having a first or top or upper surface 14A, and a second or bottom or lower surface 14B, and where the lower surface 14B, is in secure and direct contact with the upper surface 12A, of the adhesive layer 12. At the at least one particle application station 76, one could also apply at least one first or upper or top release layer 16, at one edge 12C, of the first adhesive layer 12, to form an inventive waterproofing sheet membrane with adhesive and high reflectivity granular particle layer 153. At the at least one particle application station 76, one could also apply at least one second or lower or bottom release layer 28, over at least a portion of the second adhesive layer 22, so as to form an inventive waterproofing sheet membrane with adhesive and high reflectivity granular particle layer 153. The processed sheet 153, is then captured by a spool 82, of the spooling machine 80, and is rolled onto the spool 82, as a finished product or sheet 153. The spooling machine 80, typically has at least one arm 84, to hold the spool 82, as the finished product or sheet 153, is being rolled onto the spool 82. It should be appreciated that when the plastic sheet or sheet membrane or layer 10, is exposed to high electrical current 75, or similar other means 75, to change the characteristics of the surface 10A, 10B, of the plastic or sheet membrane or layer 10, chemically, and this allows for materials, such as, for example, adhesives 12, 22, sealants, ink, etc., to name a few, to easily, and securely bond, or adhere to the surface 10A, 10B, of the sheet membrane 10. It should be appreciated that each of the stations 72, 74, 76, could be at the same location or they could be at a different location. Similarly, the first or upper or top release liner or layer 16, could be applied at station 76, or at a different location. Additionally, the second or lower or bottom release liner or layer 28, could be applied at station 76, or at a different location. The inventive waterproofing sheet membrane with adhesive and high reflectivity granular particle layer 153, is similar to the fourth embodiment of the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 53, as illustrated in Figure 4. It should be appreciated that the high voltage wire 75, could charge and change the chemical properties of the sheet membrane 10, along a vertical path, a

horizontal path, along an edge, or along the whole sheet 10, or along a specific area or section as desired by a user or a manufacturer.

[0048] As one can see in Figure 13, that the inventive below grade, blind side, waterproofing sheet membrane with adhesive and high reflectivity granular particle layer to fully bond to concrete/shotcrete 153, has a dual release liner 16, 28, comprising of a first or top or upper release liner 16, at one end or edge or portion 12C, of the inventive waterproofing sheet membrane with adhesive and high reflectivity granular particle layer 153, and a second or bottom or lower release liner 28, at the opposite end or edge or portion 10C, of the inventive waterproofing sheet membrane with adhesive and high reflectivity granular particle layer 153. As stated earlier that the dual release layer 16, 28, of the processed sheet 153, allows for either or both of the release layers 16, 28, to be removed in situ, and this allows the underlying adhesive 12, 22, to adhere to the surface to which it is applied or mated or secured to, and this is especially important under water or in a damp or moist environment where no additional steps need to be taken to secure the processed sheet 153, to its mating surface, such as, for example, the retaining means 17, the drain board 18, the retaining wall 27, the soil retention system 37, to name a few.

[0049] For some applications the back side or bottom surface 10B, of the plastic sheet or sheet membrane or layer 10, could be made smooth, or have a substantially smooth surface 10B. Similarly, for some applications the plastic sheet or sheet membrane or layer 10, could be exposed to high electrical current or voltage 75, 85, or similar other means 75, 85, to change the characteristics of the surface 10A, 10B, of the plastic or sheet membrane or layer 10, chemically so that objects, such as, for example, adhesives 12, 22, sealants, ink, etc., to name a few, could easily adhere, or bond to the processed sheet membrane 10. It is preferred that the plastic or sheet membrane 10, which has been exposed to the high electrical current or voltage 75, 85, has a dyne level reading of 38 or more, or a reading of 38 dyne/cm or more. A dyne level is the measure of surface energy. The more surface energy or higher dyne level a surface has, the better an adhesive 12, 22, or a sealant will adhere to it.

[0050] The at least one layer of at least one high reflectivity granular particle layer 14, can be selected from a group comprising of sand, partially hydrated cement granules, such as, made of gray cement, or a white cement that has been tinted or dyed to provide a darker color or high reflectivity, tinted granules, gray sand, black sand, red sand, silica sand, quartz sand covered with a layer of titanium dioxide, and combinations thereof, to name a few. For some applications one could tint or dye or color the granules particles 14, such as, for example, the high reflectivity granular particle layer 14, could be, for example, a blue color, a gray color, and combinations thereof, to name a few.

[0051] The at least one sheet membrane 10, with at least one adhesive 12, and the at least one layer of at least one high reflectivity granular particle layer 14, such as, for example, an Aussie Skin 550, Aussie Skin 560, sheet or layer, is very thick, such as, for example, about 1.2 mm thick. The at least one layer of the at least one sheet membrane with adhesive, such as, for example, the Aussie Skin 550, Aussie Skin 560, sheet or layer, preferably has a thickness from say between about 20 mils, to about 240 mils. For some applications one could also use a high-density polyethylene (HDPE) sheet membrane, a thermoplastic olefin (TPO) sheet membrane, a polyvinyl chloride (PVC) sheet membrane, a blended sheet membrane, or a combination thereof, or, for example, Aussie Skin 550, Aussie Skin 560, sheet or layer, having different thicknesses, depending on the job requirements, and ranging, for example, from about 0.5 mm to about 2.5 mm thick, that can be secured to the exposed face of the receiving surface, such as, for example, a foundation, or a wall.

[0052] For areas where at least one sheet membrane with adhesive, such as, for example, Aussie Skin 550 sheet or layer, Aussie Skin 560 sheet or layer, is being joined to another sheet membrane with adhesive layer, such as, at a seam, it is preferred that the area that is going to be overlapped has clean surfaces. Before bonding the next layer of the at least one sheet membrane with adhesive to an existing layer, or an adjacent layer, or a second layer, of at least one sheet membrane with adhesive, one should remove the release film(s)

from the factory laps. It is preferred the next or second at least one sheet membrane with adhesive or barrier layer be installed and mated with the previous or already installed at least one sheet membrane with adhesive, and has, for example, a minimum of say, between about 2.0 inches to about 6.0 inches overlap. For some applications it is preferred that a pressure source 81, such as, for example, a steel or rubber roller 81, is rolled or passed over the lap or the joint area or seam 66, as shown in Figure 6, several times while applying pressure 81, to ensure proper adhesion between the first at least one sheet membrane with adhesive layer and the second at least one sheet membrane with adhesive layer that are being joined at their respective edges. For some applications, such as, for example, during cold or wet weather where a first at least one sheet membrane with adhesive layer for some reason is not adhering to a second at least one sheet membrane with adhesive layer, one could optionally, and gently, use a heat gun, or welder (such as, a Liester welder), which will help improve the adhesion between the two overlapping sheet membranes with adhesive layers 23.

[0053] For some applications, such as, for example, the first inventive sheet membrane 23A, has to be secured to a second inventive sheet membrane 23B, Such as shown in Figures 5-9, it is preferred that a steel or rubber roller 81, is rolled or passed over the lap or the joint area 31, 51, 61, several times while applying pressure to ensure proper adhesion between the first at least one inventive sheet membrane 23A, and the second at least one inventive sheet membrane 23B, that are being joined at their respective edges. For some applications, such as, for example, during cold or wet weather where a first at least one inventive sheet membrane 23A, for some reason is not adhering to a second at least one inventive sheet membrane 23B, one could optionally, and gently, use a heat gun 81, or welder 81, (such as, a Liester welder), which will help improve the adhesion between the two overlapping inventive sheet membranes 23A, and 23B.

[0054] The inventive sheet membrane 23, comprises of at least one sheet membrane 10, having at least one layer of at least one first adhesive layer 12, along with the at least one layer of at least one high reflectivity granular particle layer 14, such as, for example, an

Aussie Skin 550, Aussie Skin 560, inventive sheet membrane 23, is very thick, such as, for example, about 1.2 mm thick. The at least one layer of the at least one sheet membrane 10, with at least one first adhesive layer 12, having at least one layer of high reflectivity granular particle layer 14, such as, for example, the Aussie Skin 550, Aussie Skin 560, inventive sheet membrane 23, preferably has a thickness from say between about 20 mils, to about 240 mils. For some applications one could also use a high-density polyethylene (HDPE) sheet membrane 10, having at least one layer of at least one first adhesive layer 12, along with the at least one layer of at least one high reflectivity granular particle layer 14, such as, for example, Aussie Skin 550, Aussie Skin 560, inventive sheet membrane 23, and having different thicknesses, depending on the job requirements, and ranging, for example, from about 0.5 mm to about 2.5 mm thick, that can be secured to the exposed face of the receiving surface 42, 44, such as, for example, a foundation 13, or a wall 15.

[0055] For areas where at least one sheet membrane 10, having at least one layer of at least one first adhesive layer 12, along with the at least one layer of at least one high reflectivity granular particle layer 14, such as, for example, Aussie Skin 550 sheet or layer, Aussie Skin 560 inventive sheet membrane 23, is being joined to another sheet membrane 10, having at least one layer of at least one first adhesive layer 12, along with the at least one layer of at least one high reflectivity granular particle layer 14, such as, at a gap or seam 31, it is preferred that the area that is going to be overlapped 31, 51, 61, has clean surfaces. Before bonding the next layer of the at least one sheet membrane 10, with first adhesive layer 12, with the at least one layer of at least one high reflectivity granular particle layer 14, to an existing layer, or an adjacent layer, or a second layer, of at least one sheet membrane with adhesive, one should remove the release sheet or film(s) from the factory laps. It is preferred the next or second at least one inventive sheet membrane 23, be installed and mated with the previous or already installed at least one inventive sheet membrane 23, and has, for example, a minimum of say, between about 2.0 inches to about 6.0 inches overlap 51, 61. For some applications it is preferred that at least one pressure source 81, such as, for example, a steel or rubber roller 81, is rolled or passed over the gap or seam 31, or the joint area 31, 51, 61,

several times while applying pressure 81, to ensure proper adhesion between the first at least one inventive sheet membrane 23A, and the second at least one inventive sheet membrane 23B, that are being joined at their respective edges. For some applications, such as, for example, during cold or wet weather where a first at least one inventive sheet membrane 23A, for some reason is not adhering to a second at least one inventive sheet membrane 23B, one could optionally, and gently, use a heat gun 81, or welder 81, (such as, a Liester welder), which will help improve the adhesion between the two overlapping inventive sheet membranes or layers 23A, and 23B. It should be understood that the at least one pressure source 81, can be similarly used to secure a first inventive sheet or membrane 23, 23A, 33, 43, 53, 53A, to a second inventive sheet or membrane 23, 23B, 33, 43, 53, 53B.

[0056] The reflectivity as mentioned herein can be measured in a number of ways, such as, for example, using a Novo Shade Duo Reflectivity Meter. The Novo Shade Duo Reflectometer has 3 distinct modes of operation, each using the 0/45 geometry, which are, (a) measuring the shade of a surface on a greyscale, (b) measuring the substrate opacity / hiding power, and (c) measuring the substrate cleanliness. Once a sample is placed in the reflectivity meter, within a fraction of a second, the result is displayed in "percentage Reflectance". For the purposes of understanding, a substantially black sample would be displayed as "0 percent Reflectance", while a substantially bright white sample would result in a reading by the reflectivity meter as being "100 percent Reflectance". Only shading is measured, irrespective of color, and is commonly referred to as percent whiteness or percent darkness. The first or reflective surface 14A, of the inventive sheet membrane or layer of the present invention 23, 33, 43, 53, 63, 73, 83, 93, 103, has a whiteness or brightness value that is between about 45 percent reflectivity to about 80 percent reflectivity. Even though the Novo Shade Duo Reflectivity Meter is extremely accurate however, during the mass production of the at least one layer of at least one high reflectivity granular particle layer 14, one should take into account the batch variances, and thus one could have a variation or standard deviation for the reflectivity percentage between each batch or at least one layer of

at least one high reflectivity granular particle layer 14, and another layer of at least one high reflectivity granular particle layer 14.

[0057] Another Reflectivity measuring device currently in use in the market is made by Rhopoint Instruments, Ltd., and is called Model Number Novo-Shade Duo+ (Novo-Shade DuoPlus), which is a dual function 45/0 degree reflectometer. The Novo-Shade DuoPlus has many features, such as, for example it measures the Reflectivity, based on measuring the shade of a surface on a greyscale, and also allows the measuring of the substrate opacity/hiding power, and it can also measure the substrate cleanliness. And, thus one can easily use the Novo-Shade DuoPlus to check that the reflectivity of the at least one layer of at least one high reflectivity granular particle layer 14A, is between about 45 percent reflectivity to about 80 percent reflectivity.

[0058] Shotcrete 13, 15, or sprayed concrete 13, 15, is concrete 13, 15, or mortar 13, 15, conveyed through a hose (not shown) and pneumatically projected at high velocity onto a receiving surface 42, 44, as a construction technique. For some applications the sprayed concrete 13, 15, or shotcrete 13, 15, is typically reinforced by conventional securing means 47, such as, for example, steel rods, steel mesh, fibers, and combinations thereof, or, for example, a rebar cage. Shotcrete 13, 15, can be placed, and compacted at the same time, due to the force with the nozzle, and it can be sprayed onto any type or shape of receiving surface 42, 44, including vertical wall surface 44, horizontal floor surface 42, or overhead areas (not shown), such as, along a roof or ceiling, which is done in a similar manner as the application along the horizontal floor surface 42, or a vertical wall surface 44, and would be well known to a person skilled in the art.

[0059] For some applications, such as, below the water table 48, a drain board 18, may be substituted with an approved protection layer 18, as long as the approved protection layer 18, is providing sufficient protection for the inventive sheet waterproofing membrane 23, 33, 43, 53, 63, 73, 83, 93, 103, installed on the building or structure 54.

[0060] As stated earlier that this invention 23, 33, 43, 53, 63, 73, 83, 93, 103, can be used, such as, for example, especially in a high risk conditions, where, for example, the building 54, or floor 13, or wall 15, or structure 13, 15, 54, is going to be built in a water table 48, area 50, and/or exposed to periodic or on-going hydrostatic pressure 48.

[0061] The present invention is not limited to the embodiments described herein and the constituent elements of the invention can be modified in various manners without departing from the spirit and scope of the invention. Various aspects of the invention can also be extracted from any appropriate combination of a plurality of constituent elements disclosed in the embodiments. Some constituent elements may be deleted in all of the constituent elements disclosed in the embodiments. The constituent elements described in different embodiments may be combined arbitrarily.

[0062] While certain embodiments of the inventions have been described, these embodiments have been presented by way of example only, and are not intended to limit the scope of the inventions. Indeed, the novel methods and systems described herein may be embodied in a variety of other forms; furthermore, various omissions, substitutions and changes in the form of the methods and systems described herein may be made without departing from the spirit of the inventions.

[0063] It should be further understood that throughout the specification and claims several terms have been used and they take the meanings explicitly associated herein, unless the context clearly dictates otherwise. For example, the phrase “in one embodiment” as used herein does not necessarily refer to the same embodiment, though it may. Additionally, the phrase “in another embodiment” as used herein does not necessarily refer to a different embodiment, although it may. Thus, various embodiments of the invention may be readily combined, without departing from the scope or spirit of the invention.

[0064] While the present invention has been particularly described in conjunction with a specific preferred embodiment, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art in light of the foregoing description. It is therefore contemplated that the appended claims will embrace any such alternatives, modifications and variations as falling within the true scope and spirit of the present invention.

## CLAIMS

### What Is Claimed Is:

1. A method of making a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete, comprising the steps of:
  - (a) forming a sheet having a first surface and a second surface;
  - (b) moving said sheet to at least one charging station, and applying a charge to said first surface and said second surface of said sheet using at least one ground wire along said first surface of said sheet, and at least one high voltage wire along said second surface of said sheet to form a charged sheet;
  - (c) moving said charged sheet to at least one adhesive station, and applying at least one first adhesive layer along said first surface of said sheet, and applying at least one second adhesive layer along at least a portion of said second surface of said sheet, to form a sheet with at least one adhesive layer;
  - (d) moving said sheet with at least one adhesive layer to at least one particle application station, and applying at least one layer of at least one granular reflective particle layer along at least a portion of said at least one first adhesive layer, to form a waterproofing sheet membrane having at least one adhesive layer, and having at least one granular reflective particle layer.
  
2. The method of making a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 1, comprising the step of:
  - (e) applying at least one first release liner along an edge of said at least one first adhesive layer to cover an exposed surface of said at least one first adhesive layer.
  
3. The method of making a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 1, comprising the step of:

(f) applying at least one second release liner along an edge of said at least one second adhesive layer to cover an exposed surface of said at least one second adhesive layer.

4. The method of making a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 1, wherein average reflectivity of said at least one granular reflective particle layer is between about 45 percent reflectivity to about 80 percent reflectivity.

5. The method of making a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 1, wherein average reflectivity of said at least one granular reflective particle layer is between about 60 percent reflectivity to about 70 percent reflectivity.

6. The method of making a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 1, wherein said at least one layer of at least one granular reflective particle layer is a sand layer, a partially hydrated cement granules layer, a gray cement layer, a white cement layer that has been dyed to provide a tinted granules layer, a gray sand layer, a black sand layer, a red sand layer, a silica sand layer, or a combination thereof.

7. The method of making a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 1, wherein said sheet is formed using a high-density polyethylene (HDPE) material, a thermoplastic olefin (TPO) material, a polyvinyl chloride (PVC) material, a blended material, or a combination thereof.

8. The method of making a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 1, wherein said sheet is formed using a high-density polyethylene (HDPE) material, a thermoplastic olefin (TPO) material, a polyvinyl chloride (PVC) material, a

blended material, or a combination thereof, and wherein thickness of said at least one sheet is between about 1.0 mm and about 2.5 mm.

9. The method of making a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 1, wherein at least one first release liner is removeably secured to an edge portion of said at least one first adhesive layer, and wherein said first release liner is adjacent said at least one layer of at least one granular reflective particle layer.

10. The method of making a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 1, wherein dyne level of said charged sheet is above 38 dyne/cm.

11. A below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete, comprising:

(a) at least one sheet membrane having a first membrane surface, and a second membrane surface;

(b) at least one first adhesive layer having a first adhesive surface, and a second adhesive surface, and wherein said second adhesive surface is in secure contact with at least a portion of said first membrane surface;

(c) at least one layer of at least one granular reflective particle layer, having a first particle layer surface, and a second particle layer surface, and wherein said second particle layer surface is in secure contact with at least a portion of said first adhesive surface, and wherein average reflectivity of said at least one layer of at least one granular reflective particle layer is between about 45 percent reflectivity to about 80 percent reflectivity; and

(d) adhering at least one layer of one of shotcrete and concrete layer to said at least one layer of at least one granular reflective particle layer.

12. The below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 11, wherein

said average reflectivity is between about 60 percent reflectivity to about 70 percent reflectivity.

13. The below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 11, wherein said at least one layer of at least one high reflectivity granular particle layer is a sand layer, a partially hydrated cement granules layer, a gray cement layer, a white cement layer that has been dyed to provide a tinted granules layer, a gray sand layer, a black sand layer, a red sand layer, a silica sand layer, or a combination thereof.

14. The below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 11, wherein said second membrane surface has a distinct surface, and wherein said distinct surface is a smooth surface, a textured surface, an embossed surface, an undulating surface, or a combination thereof.

15. The below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 11, wherein said at least one sheet membrane is made from a high-density polyethylene (HDPE) material, a thermoplastic olefin (TPO) material, a polyvinyl chloride (PVC) material, a blended material, or a combination thereof.

16. The below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 11, wherein said at least one sheet membrane is made from a high-density polyethylene (HDPE) material, a thermoplastic olefin (TPO) material, a polyvinyl chloride (PVC) material, a blended material, or a combination thereof, and wherein thickness of said at least one sheet membrane is between about 1.0 mm and about 2.5 mm.

17. The below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 11, wherein

at least one edge portion of said first adhesive surface has removeably secured thereto at least one first protective release sheet.

18. The below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 11, wherein at least one edge portion of said first adhesive surface has removeably secured thereto at least one first protective release sheet, and wherein said at least one first protective release sheet is adjacent and substantially planar with said at least one layer of at least one granular reflective particle layer.

19. A method of forming a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete, comprising the steps of:

(a) taking at least one sheet membrane having a first membrane surface, and a second membrane surface;

(b) applying at least one first adhesive layer having a first adhesive surface, and a second adhesive surface, onto said at least one sheet membrane, and wherein said second adhesive surface is in secure contact with at least a portion of said first membrane surface;

(c) applying at least one layer of at least one granular reflective particle layer, having a first particle layer surface, and a second particle layer surface, over at least a portion of said at least one first adhesive layer, and wherein said second particle layer surface is in secure contact with at least a portion of said first adhesive surface, and wherein average reflectivity of said at least one layer of at least one granular reflective particle layer is between about 45 percent reflectivity to about 80 percent reflectivity; and

(d) adhering at least one layer of one of shotcrete and concrete layer to said at least one layer of at least one granular reflective particle layer.

20. The method of forming a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 19, wherein said average reflectivity is between about 60 percent reflectivity to about 70 percent reflectivity.

21. The method of forming a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 19, wherein said at least one layer of at least one granular reflective particle layer is a sand layer, a partially hydrated cement granules layer, a gray cement layer, a white cement layer that has been dyed to provide a tinted granules layer, a gray sand layer, a black sand layer, a red sand layer, a silica sand layer, or a combination thereof.

22. The method of forming a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 19, wherein said second membrane surface has a distinct surface, and wherein said distinct surface is a smooth surface, a textured surface, an embossed surface, an undulating surface, or a combination thereof.

23. The method of forming a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 19, wherein said at least one sheet membrane is made from a high-density polyethylene (HDPE) material, a thermoplastic olefin (TPO) material, a polyvinyl chloride (PVC) material, a blended material, or a combination thereof.

24. The method of forming a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 19, wherein said at least one sheet membrane is made from a high-density polyethylene (HDPE) material, a thermoplastic olefin (TPO) material, a polyvinyl chloride (PVC) material, a blended material, or a combination thereof, and wherein thickness of said at least one sheet membrane is between about 1.0 mm and about 2.5 mm.

25. The method of forming a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 19, wherein at least one edge portion of said first adhesive surface has removeably secured thereto at least one first protective release sheet.

26. The method of forming a below grade, blind side, waterproofing sheet membrane with adhesive and a granular reflective particle layer to fully bond to concrete/shotcrete of Claim 19, wherein at least one edge portion of said first adhesive surface has removeably secured thereto at least one first protective release sheet, and wherein said at least one first protective release sheet is adjacent and substantially planar with said at least one layer of at least one granular reflective particle layer.

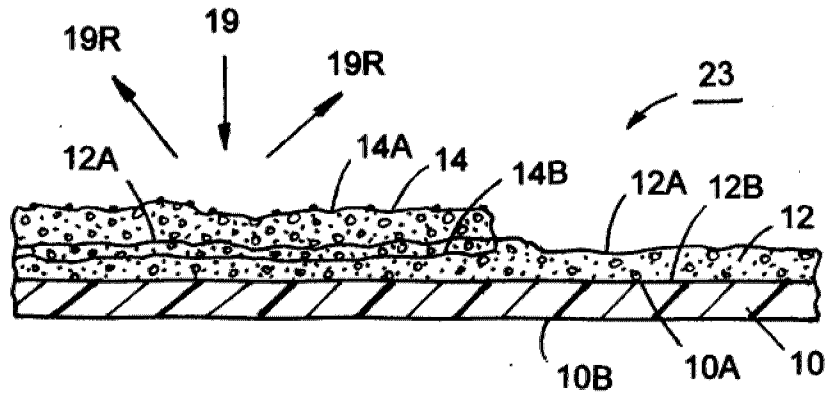


FIG. 1

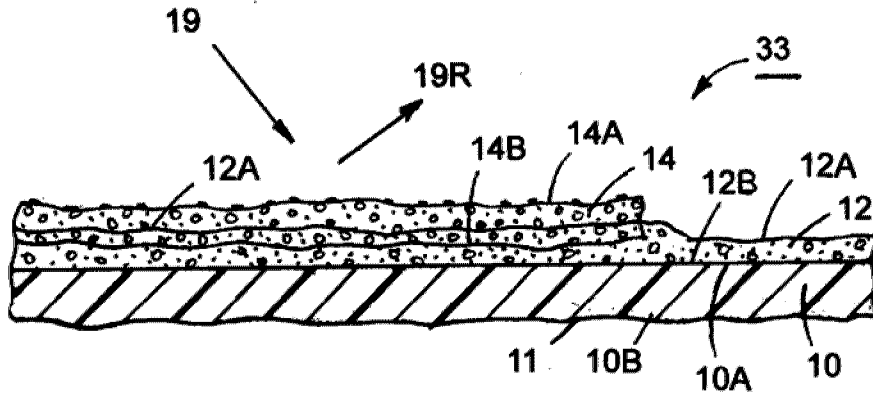


FIG. 2

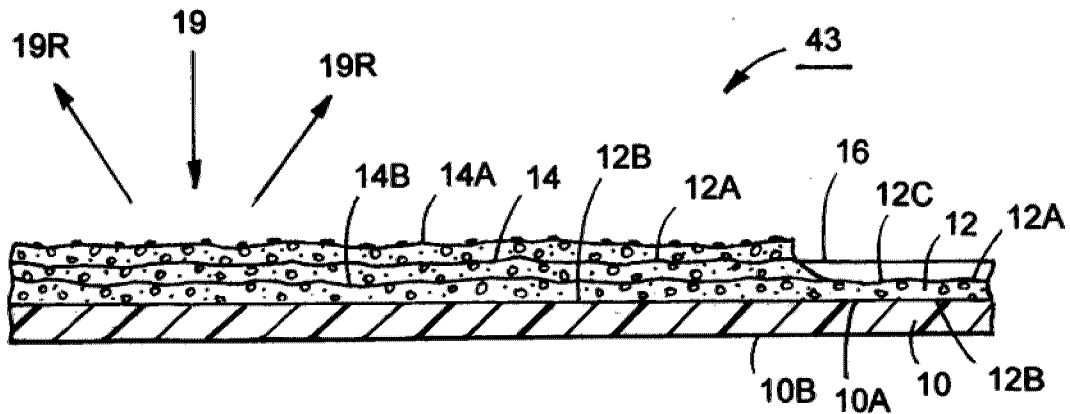


FIG. 3

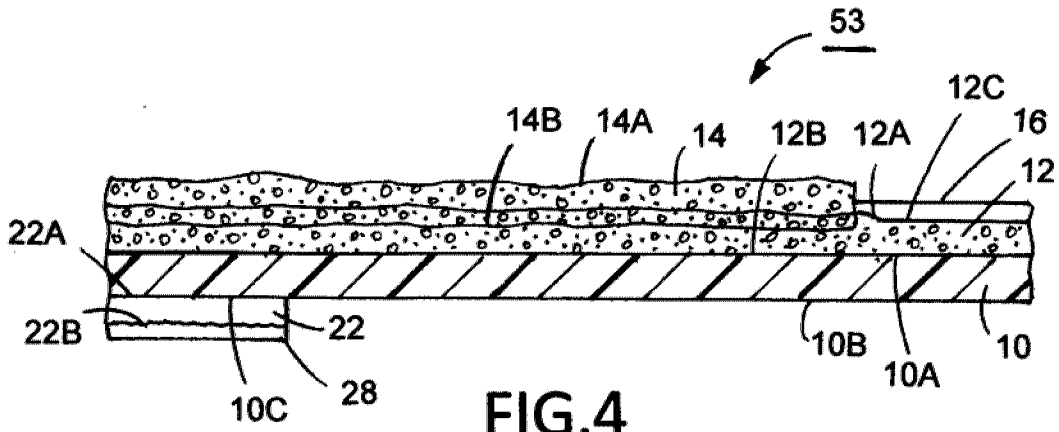


FIG. 4

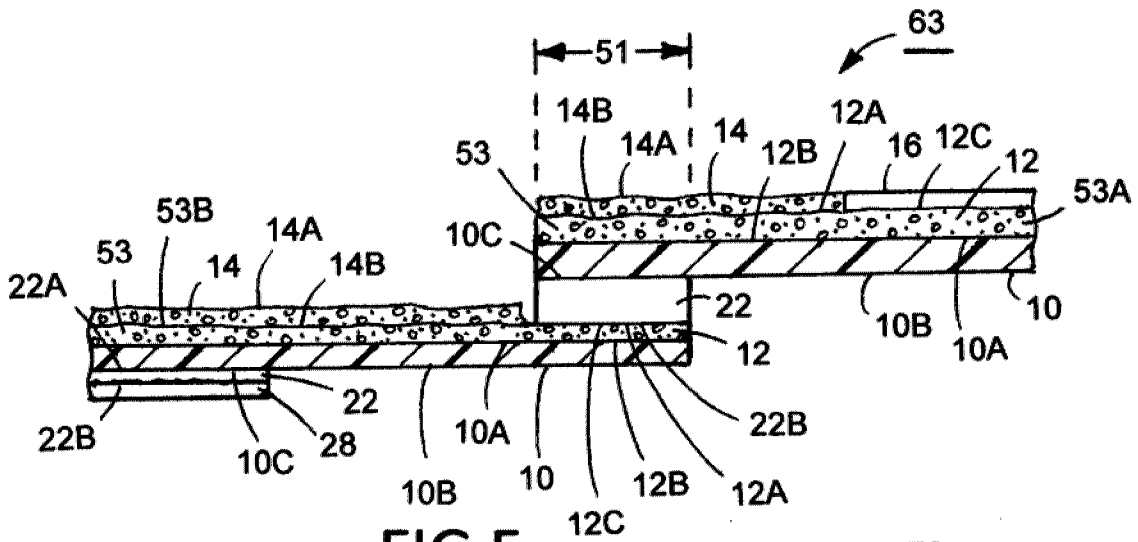


FIG. 5

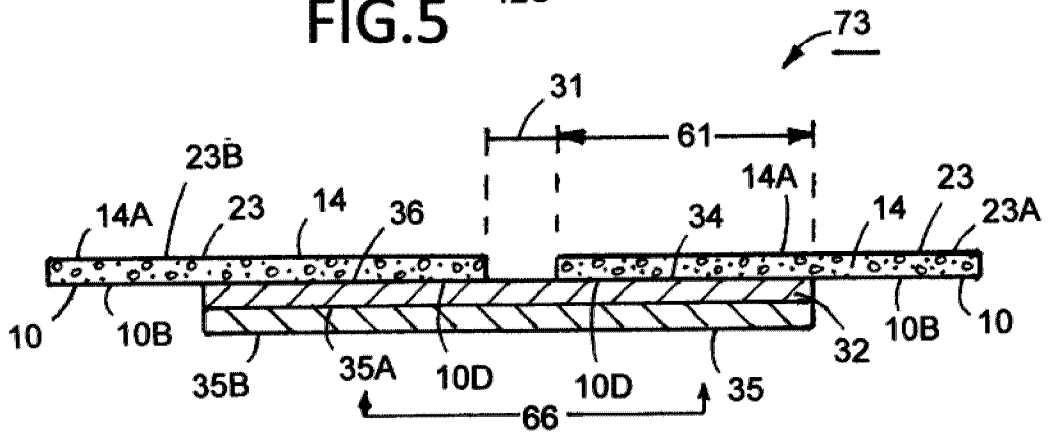


FIG. 6

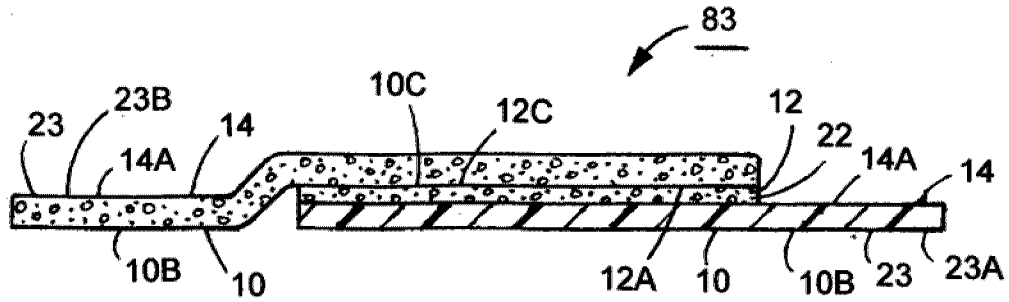


FIG. 7

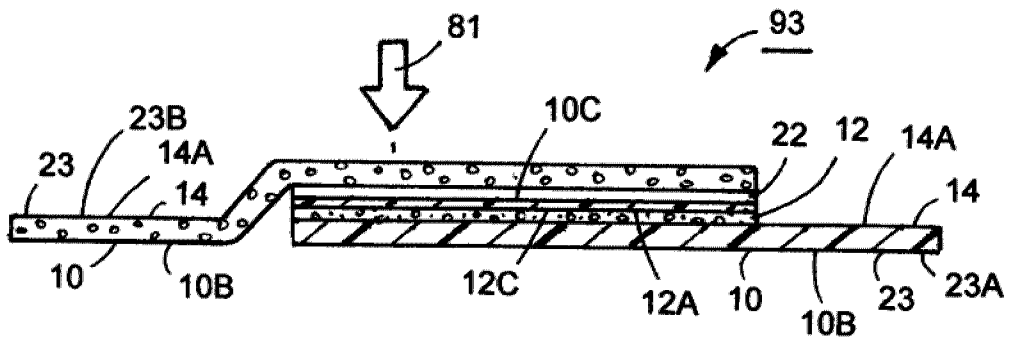


FIG. 8

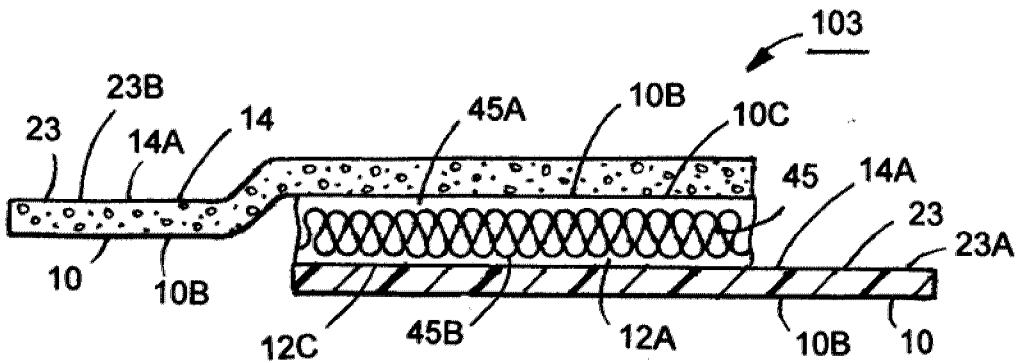


FIG. 9

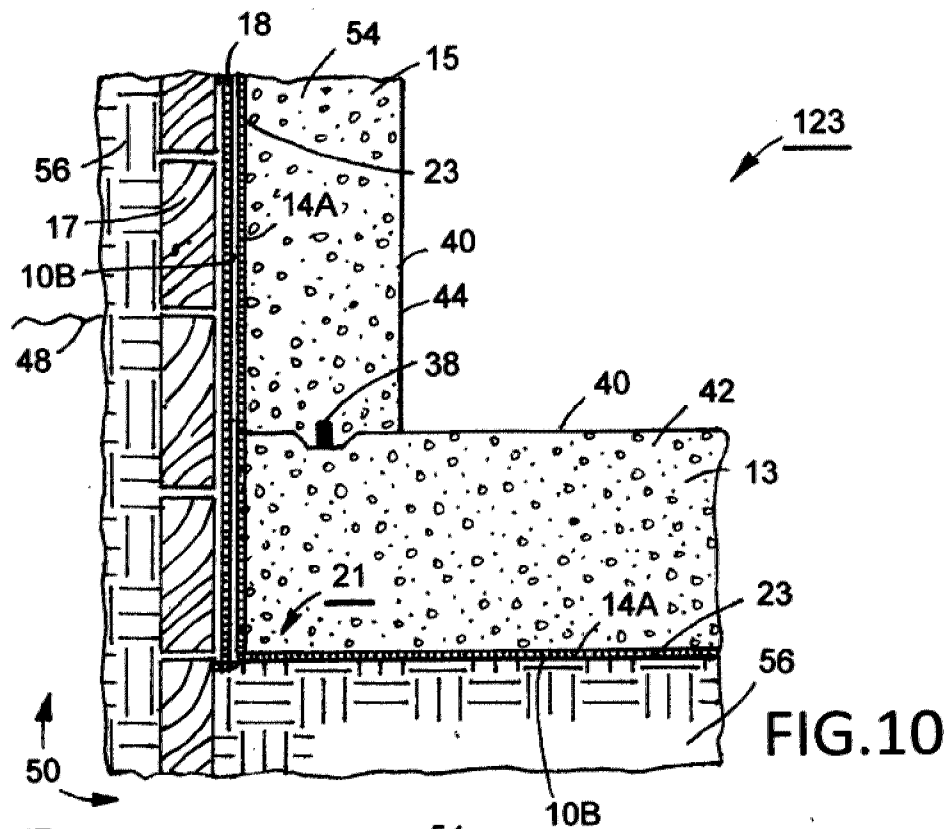


FIG. 10

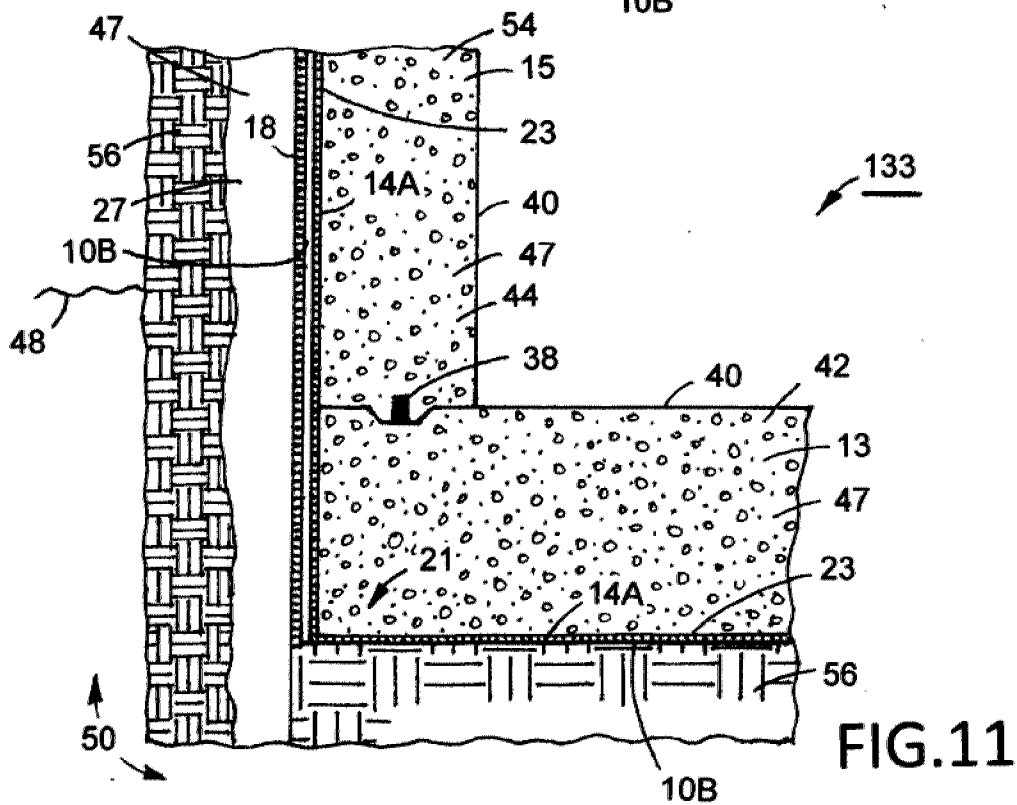


FIG. 11

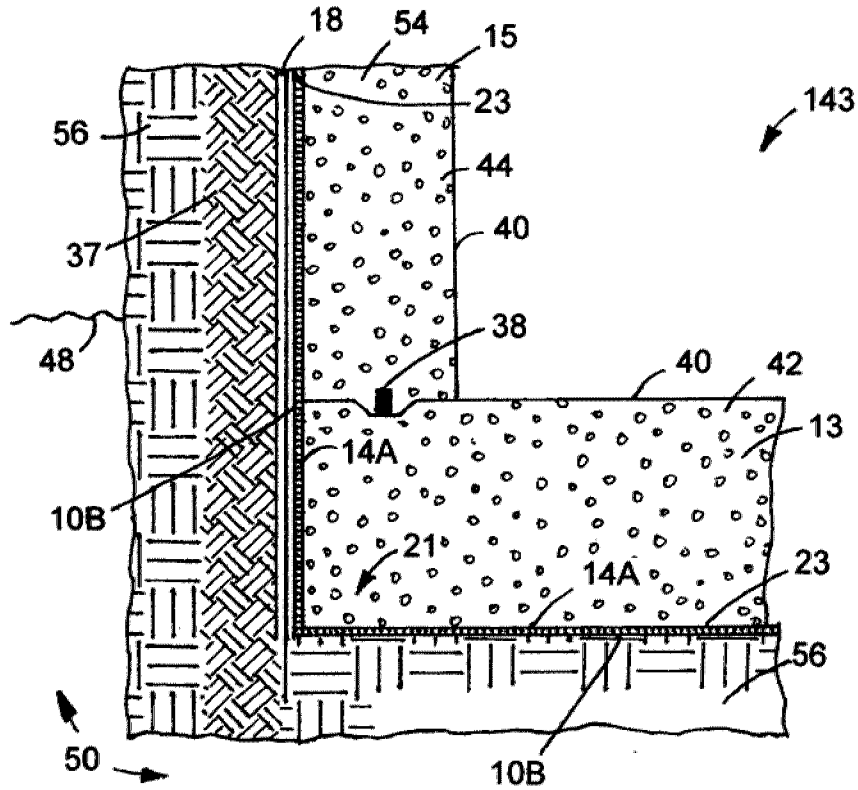


FIG. 12

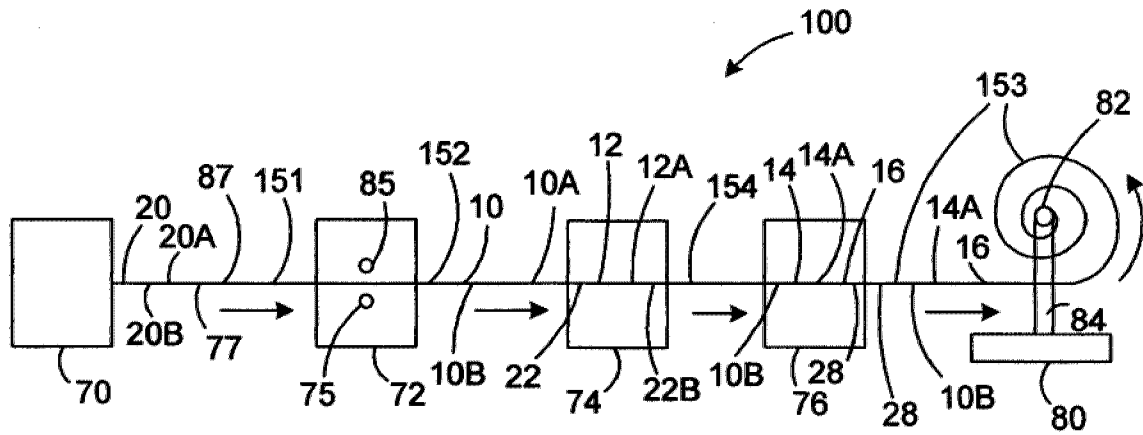


FIG. 13

