



(11) **EP 4 407 117 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
31.07.2024 Bulletin 2024/31

(21) Application number: **24154814.8**

(22) Date of filing: **30.01.2024**

(51) International Patent Classification (IPC):
E04F 13/076 ^(2006.01) **E04F 13/077** ^(2006.01)
E04F 13/08 ^(2006.01) **E04F 13/09** ^(2006.01)
E04F 13/12 ^(2006.01) **E04F 13/14** ^(2006.01)
E04F 13/24 ^(2006.01)

(52) Cooperative Patent Classification (CPC):
E04F 13/076; E04F 13/077; E04F 13/0803;
E04F 13/0805; E04F 13/0862; E04F 13/0864;
E04F 13/0871; E04F 13/0873; E04F 13/088;
E04F 13/09; E04F 13/123; E04F 13/142;
E04F 13/24

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(30) Priority: **30.01.2023 CN 202320142516 U**
30.01.2023 CN 202310074652

(71) Applicant: **Haoheng (Fujian) Building Materials**
Technology Co., Ltd.
363000 Zhangzhou, Fujian (CN)

(72) Inventors:
• **HONG, Qiuyao**
Zhangzhou, 363000 (CN)
• **SU, Yongrun**
Zhangzhou, 363000 (CN)
• **SHUI, Sijun**
Zhangzhou, 363000 (CN)

(74) Representative: **Chung, Hoi Kan**
Mandarin IP Limited
7 Cherry Trees
Great Shelford
Cambridge CB22 5XA (GB)

(54) **CERAMIC TILE HANGING SYSTEM**

(57) A tile hanging system attached to an installation surface, including mounting components fixed to the installation surface and tiles attached to the mounting component. The mounting component includes fitting members extending upward from top surface of the mounting component. The fitting members are integrally formed with the mounting components. The tiles are abutted against to each other, and each tile has an inclined groove. The inclined groove is attached to the fitting

member. The inclined groove includes a first mounting portion arranged on side of the tile away from the decorative surface and a second mounting portion extending from the first mounting portion into the interior of the tile. The fitting member includes a first connecting portion extending upward from the mounting component. The first connecting portion abuts the first mounting portion, and a second connecting portion extending from the first connecting portion into the second mounting portion.

EP 4 407 117 A2

Description

TECHNICAL FILED

[0001] The present invention relates to a building brick mounting system, particularly to a ceramic tile hanging system.

BACKGROUND

[0002] Ceramic tiles are typically produced by high-temperature firing, using high-quality clay, purple sand clay, and other materials. Compared to traditional clay bricks, ceramic tiles have a finer texture, more stable color, and elegant lines. They serve as an energy-efficient and environmentally friendly building facade material, being pollution-free, lightweight, high-strength, corrosion-resistant, with good seismic and freeze resistance, and sound insulation. This cleverly combines traditional ceramic culture with modern architecture, meeting national requirements for building energy efficiency.

[0003] In the formation of facades with ceramic tiles, the conventional approach involves grooving on the back of the tiles. Subsequently, attachment components are attached to the grooves, and hangers are suspended on connecting components. Finally, the connecting components are fixed on the keel, completing the rapid mounting process.

[0004] However, existing grooving methods either directly create deep grooves on the inner side of ceramic tiles to enhance attachment effects, or employ complex attachment structures with various styles to improve attachment force through stacked structures. While directly creating deep grooves for secure coupling ensures sufficient attachment force, it results in thinning the solid part of the tile, making it prone to damage or breakage. On the other hand, employing numerous attachment structures, whether during mounting or replacement, necessitates complex procedures. In elevated locations, construction becomes challenging, reducing mounting efficiency. Moreover, a plethora of attachment structures increases the overall mounting cost of the facade, making cost control inconvenient for the construction party.

SUMMARY

[0005] Therefore, the present invention aims to provide a low-cost ceramic tile hanging system with a simple attachment structure that can stably deliver attachment force.

[0006] The present invention provides a ceramic tile hanging system that effectively addresses the aforementioned issues.

[0007] The present invention is implemented as follows:

A ceramic tile hanging system, firmly attached to an installation surface, including mounting components and ceramic tiles.

[0008] The mounting components are securely fixed on the installation surface. The mounting components include several fitting members extending upward from the top surface of the mounting components, and the fitting members are integrally formed with the mounting components;

[0009] The ceramic tiles are hung on and attached to the mounting components, with the sides of the ceramic tiles being abutted against each other. Each of the ceramic tiles has an inclined groove, and the inclined groove is hooked onto and attached to the fitting members.

[0010] The inclined groove includes a first mounting portion arranged on the side away from the ceramic tile decorative surface, and a second mounting portion extending from the first mounting portion into the interior of the ceramic tile.

[0011] Each of the fitting members includes a first connecting portion extending upward from the mounting components. The first connecting portion is abutted against the first mounting portion, and a second connecting portion extending from the first connecting portion into the second mounting portion.

[0012] In some embodiments, the first mounting portion is inclined. The second mounting portion is in communication with and level with the horizontal plane. The first connecting portion is fitted into the first mounting portion, and the second connecting portion is fitted into the second mounting portion.

[0013] In some embodiments, each of the fitting members further includes a third connecting portion extending from the second connecting portion into the second mounting portion.

[0014] In some embodiments, one end of the inner side of the first mounting portion is linear, and the other end is slanted. The second mounting portion is in communication with and level with the horizontal plane. The first connecting portion is perpendicular to and abuts against the linear inner side of the first mounting portion. The second connecting portion is perpendicular to the first connecting portion. The third connecting portion is slanted upward from the second connecting portion, or alternatively, the third connecting portion is slanted downward from the second connecting portion.

[0015] In some embodiments, one end of the inner side of the first mounting portion is linear, and the other end is slanted. The second mounting portion is in communication with and level with the horizontal plane. The first connecting portion is perpendicular to and abuts against the linear inner side of the first mounting portion. The second connecting portion is slanted downward from the first connecting portion. The third connecting portion is slanted upward from the first connecting portion.

[0016] In some embodiments, one end of the inner side of the first mounting portion is linear, and the other end is slanted. The second mounting portion is in communication with and level with the horizontal plane. The first connecting portion is perpendicular to and abuts against the linear inner side of the first mounting portion. The

second connecting portion is slanted downward from the first connecting portion. The third connecting portion is slanted downward from the first connecting portion.

[0017] In some embodiments, the first mounting portion is inclined, the second mounting portion tilts downward/upward from the first mounting portion. The first connecting portion is fitted into the first mounting portion. The second connecting portion is connected to and level with the horizontal plane. The third connecting portion is connected to upper portion or lower portion of the second connecting portion.

[0018] In some embodiments, the first mounting portion is inclined, the second mounting portion is slanted downward/upward from the first mounting portion. The first connecting portion is fitted into the first mounting portion. The second connecting portion is slanted downward from the first connecting portion. The third connecting portion is connected to upper portion or lower portion the second connecting portion.

[0019] In some embodiments, the mounting component is C-shaped steel, and several fitting members are evenly spaced along the C-shaped steel. The C-shaped steel is securely fixed to the keel, and the keel is securely fixed to the installation surface.

[0020] In some embodiments, the mounting components are mounting baseplates, and several fitting members are arranged on the mounting baseplates. The mounting baseplates are securely fixed to the installation surface, or alternatively, the mounting baseplates are securely fixed to the keel, and the keel is securely fixed to the installation surface.

[0021] The advantages of the present invention are as follows.

[0022] The present invention achieves a stable hanging of ceramic tiles by the design of inclined grooves on the tiles and corresponding fitting members on the mounting components. With only one inclined groove on each ceramic tile, the corresponding mounting part and fitting part can be matched by vertical or horizontal insertion. This ensures that at least two pivot points on the inclined groove inside the ceramic tile coordinate with the fitting members on the mounting components. The result is a simple structure that achieves secure hanging of the ceramic tiles. Once fixed, the ceramic tiles are restricted by the mounting components in the vertical/horizontal direction, promoting mutual adherence between adjacent tiles in the horizontal/vertical direction. During mounting, workers only need to secure and lock the mounting components first, followed by stacking layer by layer of ceramic tiles. This significantly accelerates both the mounting and removal processes. Additionally, due to the simplicity of the hanging structure, the overall cost is substantially reduced, making it more competitive in the market.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] To further clarify the technical solution of the

embodiments of the present invention, the following brief introduction will be made to the drawings required for the embodiments. It should be understood that the following drawings only illustrate some embodiments of the present invention and should not be construed as limiting the scope. Ordinary skilled artisans in this field can obtain other relevant drawings based on these drawings without creative effort.

FIG. 1 is a schematic diagram (first perspective) illustrating the ceramic tile hanging system provided by the present invention.

FIG. 2 is a schematic diagram (second perspective) illustrating the ceramic tile hanging system provided by the present invention.

FIG. 3 is a schematic diagram illustrating a mounting baseplate provided by the present invention.

FIG. 4 is a front view schematic diagram of the ceramic tile hanging system provided in the Embodiment 4 of the present invention.

FIG. 5 is a front view schematic diagram of the ceramic tile provided in Embodiments 1-4.

FIG. 6 is a front view schematic diagram of the ceramic tile provided in Embodiments 5-6 (second mounting portion tilting downward).

FIG. 7 is a front view schematic diagram of the ceramic tile provided in Embodiments 5-6 (second mounting portion tilting upward).

FIG. 8 is a schematic diagram of a fitting member provided in Embodiment 1 of the present invention.

FIG. 9 is a schematic diagram of a fitting member provided in the Embodiment 2 of the present invention (third connecting portion tilting downward).

FIG. 10 is a schematic diagram of a fitting member provided in the Embodiment 2 of the present invention (third connecting portion tilting upward).

FIG. 11 is a schematic diagram of a fitting member provided in the Embodiment 3 of the present invention.

FIG. 12 is a schematic diagram of a fitting member provided in the Embodiment 4 of the present invention.

FIG. 13 is a schematic diagram of a fitting member provided in the Embodiment 5 of the present invention (third connecting portion connected below the second connecting portion).

FIG. 14 is a schematic diagram of a fitting member provided in the Embodiment 5 of the present invention (third connecting portion connected above the second connecting portion).

FIG. 15 is a schematic diagram of a fitting member provided in the Embodiment 6 of the present invention (third connecting portion connected above the second connecting portion).

FIG. 16 is a schematic diagram of a fitting member provided in the Embodiment 6 of the present invention (third connecting portion connected below the second connecting portion).

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0024] In order to include all embodiments within the scope of protection of the present invention, the detailed description of the embodiments of the present invention provided in the drawings below is not intended to limit the scope of the claimed invention but merely represents selected embodiments of the present invention. Based on the embodiments disclosed in the present invention, all other embodiments obtained by ordinary skilled artisans in this field without creative effort also fall within the scope of protection of the present invention.

[0025] In the description of the present invention, the terms "first" and "second" are used for descriptive purposes only and should not be construed as indicating the purpose, technical solution, and advantages of the embodiments more clearly. Below, the technical solutions in the embodiments of the present invention will be described clearly and completely with reference to the accompanying drawings. It is evident that the described embodiments are part of the embodiments of the present invention, not all embodiments. Based on the embodiments of the present invention, all other embodiments obtained by ordinary skilled artisans without creative effort may indicate the relative importance or imply the quantity of the indicated technical features. Thus, features defined as "first" and "second" may include one or more of those features, explicitly or implicitly. In the description of the present invention, the meaning of "multiple" is two or more unless otherwise specifically limited.

[0026] In the context of construction requirements, dry hanging methods are gradually replacing wet hanging methods, and various dry hanging structures are emerging. However, existing dry hanging structures constantly add various mounting and locking structures to ensure safety, such as using bolts, adhesives, and bonding agents to form a stable structure between ceramic tiles and hanging members. Although this indeed secures the mounting of ceramic tiles, the mounting phase requires a lengthy process. Workers face long periods and high costs. Additionally, once a tile is damaged or undergoes functional degradation and needs replacement, the replacement process is complex, imposing a high labor intensity on workers. High-altitude operations become more dangerous with each additional moment. To address these technical issues, the following technical solution is proposed:

[0027] Referring to FIGS. 1-16, a ceramic tile hanging system, securely attached to an installation surface. The ceramic tile hanging system includes mounting components 1, mounting ear plate 2, and ceramic tiles 3. The mounting components 1 are securely fixed to the installation surface, including several fitting members 11 extending upward from the top surface of the mounting component 1, wherein the fitting members 11 are integrally formed with the mounting component 1. The mounting ear plate 2 is welded to the outer side of the mounting component 1. The ceramic tiles 3 are hung on and at-

tached to on the mounting component 1. The ceramic tiles 3 are abutted to each other on their sides, and each ceramic tile 3 has an inclined groove 31 arranged on one side. The inclined groove 31 is hung on and attached to the fitting member 11. The inclined groove 31 includes a first mounting portion 311 arranged on the side away from the decorative surface of the ceramic tile 3 and a second mounting portion 312 extending from the first mounting portion 311 towards the interior of the ceramic tile 3. The fitting member 11 includes a first connecting portion 111 extending upward from the mounting component 1 and a second connecting portion 112 extending from the first connecting portion 111 into the second mounting portion 312. The first connecting portion 111 is abutted against the first mounting portion 311.

[0028] First, during installation, the mounting component 1 can be directly mounted not only on conventional keels but also on uneven installation surfaces. For example, in some uneven brick wall structures, the mounting component 1 can be directly secured to the uneven installation surface without the need for an intermediate keel framework. This makes the mounting more flexible.

[0029] In the actual installation process, the ceramic tiles 3 may be hung vertically or horizontally by adjusting the positions of the corresponding fitting members 11 according to user needs.

[0030] In this embodiment, the fitting members 11 do not need to be separately welded to the mounting component 1 or locked onto the mounting component 1. Instead, they are an integral part of the mounting component 1. In this embodiment, the mounting component 1 may have a conventional structure. Before leaving the factory, the manufacturer can assemble the fitting members 11 according to the requirements of the building facade to be installed. For example, knowing the spacing between the tiles, the manufacturer can determine the specific layout of the fitting members 11. Before leaving the factory, the fitting members 11 are cut into shape using a cutting machine. Subsequently, the fitting members 11 are rolled into a shape suitable for the tile hanging groove using a rolling machine. This ensures that the tile hanging system can be used immediately on-site without the need for on-site processing by professionals.

[0031] In this embodiment, the ceramic tiles 3 are grouped into an outer decorative brick layer 32 and an outer connecting brick layer 33. Both layers are made of fired clay and demonstrate good thermal insulation capabilities when installed as a curtain wall or other decorative surface.

[0032] The outer decorative brick layer 32 may be colored or engraved with different patterns based on its purpose and the mounting environment, without specific limitations.

[0033] The thickness of the outer connecting brick layer 33 should be at least 2-3 cm longer than the inclined groove 31 to ensure the overall strength of the outer connecting brick layer 33.

[0034] In this embodiment, to ensure the mounting

strength of the individual ceramic tile 3, the outer connecting brick layer 33 on each ceramic tile 3 is provided with two inclined grooves 31. This ensures that the hanging component can provide sufficient hanging force to hold both the outer decorative brick layer 32 and the outer connecting brick layer 33.

[0035] Since vertical hanging force needs to be provided, the inclined grooves 31 are inclined. If the inclined grooves 31 are arranged as straight grooves or T-shaped grooves, it would require changing the fitting member 11, making it more complex and increasing the cost.

[0036] Using a single-point fixation could result in the ceramic tile 3 easily falling off if deformed under external interference at that single point. Therefore, in this embodiment, the inclined grooves 31 are at least provided with a first mounting portion 311 and a second mounting portion 312. Correspondingly, the fitting member 11 is provided with at least a first connecting portion 111 and a second connecting portion 112. The first connecting portion 111 and the second connecting portion 112 are fitted into the first mounting portion 311 and the second mounting portion 312, forming at least two fixed nodes. This way, even if one node deforms and loses its binding effect, the other node can still provide fixation.

[0037] However, in cases where the ceramic tile has a heavier base weight or the mounting environment is harsh, relying solely on two fixed nodes may not provide sufficient fixation, and there is still a risk of the ceramic tile 3 falling off. Therefore, the fitting member 11 further includes a third connecting portion 113 extending from the second connecting portion 112 into the second mounting portion 312. The third connecting portion 113 forms a third fixed node within the second mounting portion 312. With three fixed nodes in the inclined groove 31, a three-layer fixation effect is achieved, similar to complex hanging structures. However, in terms of disassembly, mounting, and cost control, this method is superior to complex hanging structures.

[0038] Moreover, this embodiment utilizes a mechanical hanging, clamping, abutting, and fitting method, without using bolts throughout the hanging process. Even when installed at higher heights, workers can easily carry out the mounting without the need for prolonged pauses to tighten screws. Adhesives or glue are not used in this entire process, avoiding difficulties in disassembly due to the fixed effect of glue during replacement. In this embodiment, if it is necessary to replace the ceramic tile 3, only the corresponding column of ceramic tiles 3 needs to be taken down layer by layer from the top or side and then sequentially fitted with complete ceramic tiles 3.

[0039] After the hanging process is completed, the ceramic tiles 3 are stacked layer by layer in the vertical direction, being secured by individual fitting members 11. They are fixed vertically by the fitting members 11, while horizontally, the ceramic tiles 3 abut against each other, forming a tight structure with mutual compression, resulting in a complete curtain wall structure. The hanging process mentioned above can also change direction. For ex-

ample, the ceramic tiles 3 may be fixed horizontally by the fitting members 11, while vertically, the ceramic tiles 3 abut against each other.

[0040] In the horizontal position of the ceramic tiles mentioned above, they are fixed by mutual clamping between the ceramic tiles 3. To improve the fitting effect between the outer connecting brick layers 33, one side of the outer connecting brick layer 33 extends a fitting block 3321, and the other side of the outer connecting brick layer 33 has a fitting groove 3322 that is inwardly recessed. Adjacent fitting blocks 3321 and fitting grooves 3322 are clamped and connected to each other. In this way, horizontally, adjacent outer connecting brick layers 33 are sequentially fixed by fitting blocks 3321 and fitting grooves 3322, and vertically, they are firmly held by hanging components, forming a stable facing structure.

[0041] In conventional curtain walls or other decorative wall structures, after fixing ceramic tiles or other tiles, it is necessary to do some caulking to improve the insulation and waterproofing capabilities of the facing wall and enhance overall aesthetics. However, in this embodiment, caulking is achieved directly through the ceramic tile itself. Specifically, the outer decorative brick layer 32 and the outer connecting brick layer 33 are integrally formed. The outer connecting brick layer 33 is at least partially longer than the outer decorative brick layer 32, and the extended part serves as one side of the caulking. The fitting block 3321 extending from the outer connecting brick layer 332 is clamped into the fitting groove 3322. Although it is clamped in the fitting groove 3322, its width is relatively wide, and part of it remains exposed after clamping, serving as the other side of the caulking. The adjacent ceramic tiles thus form caulking on all four sides without the need for a separate caulking construction structure and steps, achieved through the tiles themselves.

[0042] Since different buildings and different mounting positions have different requirements for ceramic tiles 3 and fitting members 11, the settings of the mounting portions in the inclined groove 31 and the settings of the connecting portions in the fitting members 11 will also be adaptively adjusted accordingly. There are several embodiments. Firstly, the case where there is no third connecting portion 113 in the fitting member 11.

EMBODIMENT 1

[0043] In this embodiment, the first mounting portion 311 is inclined, and the second mounting portion 312 is connected to and level with the first mounting portion 311 and the horizontal plane. The first connecting portion 111 is fitted into the first mounting portion 311, and the second connecting portion 112 is fitted into the second mounting portion 312. In this case, both the first mounting portion 311 and the second mounting portion 312 are designed as obtuse angles, and the first connecting portion 111 and the second connecting portion 112 are also designed as obtuse angles. This achieves fixation at two nodes

and is suitable for places with a relatively mild environment and lightweight ceramic tiles.

[0044] In the subsequent embodiments, the fitting member 11 all includes a third connecting portion 113, meaning the fitting member 11 has three fixed nodes inside the inclined groove 31.

EMBODIMENT 2

[0045] In this embodiment, the inner end of the first mounting portion 311 is a straight line, and the other end of the inner side of the first mounting portion 311 is a slanted line. The second mounting portion 312 is connected to and level with the first mounting portion 311 and the horizontal plane. The first connecting portion 111 is perpendicular to and abuts the straight line on the inner side of the first mounting portion 311, the second connecting portion 112 is perpendicular to the first connecting portion 111, and the third connecting portion 113 is inclined upward or downward from the second connecting portion 112. In this embodiment, both the second connecting portion 112 and the third connecting portion 113 are located on the inner side of the second mounting portion 312, forming two fixed points. Together with the fixation between the first connecting portion 111 and the first mounting portion 311, the cooperation between them is better, and the ceramic tile 3 can be tightly secured.

EMBODIMENT 3

[0046] This embodiment differs from Embodiment 2 in that the second connecting portion 112 is inclined downward from the first connecting portion 111. Specifically: the inner end of the first mounting portion 311 is a straight line, and the other end of the inner side of the first mounting portion 311 is a slanted line. The second mounting portion 312 is connected to and level with the first mounting portion 311 and the horizontal plane. The first connecting portion 111 is perpendicular to and abuts the straight line on the inner side of the first mounting portion 311, and the second connecting portion 112 is inclined downward from the first connecting portion 111, while the third connecting portion 113 is inclined upward from the first connecting portion 111. This achieves the same technical effect as the previous embodiments.

EMBODIMENT 4

[0047] This embodiment differs from embodiment 3 in that the third connecting portion 113 is inclined downward from the first connecting portion 111. Specifically, the inner end of the first mounting portion 311 is a straight line, and the other end of the inner side of the first mounting portion 311 is a slanted line. The second mounting portion 312 is connected to and level with the first mounting portion 311 and the horizontal plane. The first connecting portion 111 is perpendicular to and abuts the straight line on the inner side of the first mounting portion 311, the

second connecting portion 112 is inclined downward from the first connecting portion 111, and the third connecting portion 113 is inclined downward from the first connecting portion 111. This achieves the same technical effect as the previous embodiments.

[0048] In Embodiments 2-4 above, the inner end of the first mounting portion 311 is a straight line, and the other end of the inner side of the first mounting portion 311 is a slanted line. The purpose of this design is, first, the inclined design of the first mounting portion 311 ensures that workers can insert it with a certain angle during mounting, making the mounting smoother. After mounting, the first connecting portion 111 can abut against the straight part of the first mounting portion 311, ensuring that the tiles 3 are closely attached to each other in daily use. Even if some tiles shake, the matching effect between the first connecting portion 111 and the first mounting portion 311 will slow down or even eliminate the shaking force.

[0049] In the above embodiments, the first mounting portion 311 is inclined at one end and straight at the other end. In fact, the first mounting portion 311 can have other styles, for example:

EMBODIMENT 5

[0050] In this embodiment, the first mounting portion 311 is inclined, the second mounting portion 312 is inclined downward/upward from the first mounting portion 311, the first connecting portion 111 is fitted into the first mounting portion 311, the second connecting portion 112 is connected to the first connecting portion 111 and level with the horizontal plane, and the third connecting portion 113 is connected to upper portion/lower portion of the second connecting portion 112. The inclined arrangement of the first connecting portion 111 and the first mounting portion 311 corresponds to each other, while the second connecting portion 112 and the third connecting portion 113 are fixed inside the second mounting portion 312. This completes the fixation with three nodes in a single groove, providing a fixation effect that is at least equal to or surpasses similar products with complex groove styles in traditional brick structures.

EMBODIMENT 6

[0051] This embodiment differs from Embodiment 5 in that the second connecting portion 112 is inclined downward from the first connecting portion 111. Specifically, the first mounting portion 311 is inclined, the second mounting portion 312 is inclined downward/upward from the first mounting portion 311, the first connecting portion 111 is fitted into the first mounting portion 311, the second connecting portion 112 is inclined downward from the first connecting portion 111, and the third connecting portion 113 is connected to lower portion/upper portion of the second connecting portion 112. In this embodiment, since the second connecting portion 112 is inclined

downward from the first connecting portion 111, there is a bending force between the first connecting portion 111 and the second connecting portion 112, and there is another bending force between the third connecting portion 113 and the second connecting portion 112. This significantly improves the bending resistance and tensile strength of the entire fitting member 11. When combined with the inclined setting of the first connecting portion 111 and the first mounting portion 311, it effectively secures the tile 3.

[0052] In practical use, for simple walls or decorative surfaces with fewer hanging tiles 3, workers can fix the mounting members 1 one by one. However, in the construction of a large-width and large-height curtain wall on the front side, if workers still tighten each mounting member 1 one by one, it will be troublesome for both workers and the construction period. Therefore, the following two embodiments are introduced in this invention:

Embodiment 7

[0053] The mounting member 1 is a C-shaped steel 1A. Multiple of fitting members 11 are evenly spaced on the C-shaped steel 1A. The C-shaped steel 1A is fixed to the keel and the keel is fixed to the installation surface. In small buildings or local installation surfaces, the fixing method of C-shaped steel 1A may be used. As mentioned above, the factory arranges the corresponding positions and spacing of the fitting members 11 according to the size of the customer's tiles 3 and transports them to the site for direct clamping to the keel or the installation surface. Then, the tiles 3 are gradually hung one by one.

[0054] The style of the fitting members 11 opened on the C-shaped steel 1A may be any style mentioned in the above embodiments, and the style of the inclined groove 31 of the tiles 3 corresponding to them may also be any style mentioned in the above embodiments, which can be combined.

Embodiment 8

[0055] This embodiment differs from Embodiment 7 in that the mounting member 1 is a mounting baseplate 1B. Specifically, the mounting member 1 is a mounting baseplate 1B with multiple of fitting members 11 arranged on it. The mounting baseplate 1B is fixed to the installation surface or fixed to the keel. When it is necessary to hang tiles 3 on a large area of a wall, for example, when a whole curtain wall needs to be hung, if one by one mounting of C-shaped steel 1A in each row is used, it is relatively troublesome for the workers. Although the hanging effect is the same, both the construction period and the labor cost have increased more than twice. However, if horizontal bars and vertical bars are directly fitted into the keel and then the entire mounting baseplate 1B is directly installed on the horizontal bars and vertical bars of the keel, the overall span is large, and due to the support of the spaced horizontal bars and vertical bars, the mount-

ing baseplate 1B is sufficiently stressed.

[0056] On the mounting baseplate 1B, the style of the fitting members 11 may be any style mentioned in the above embodiments, and the style of the inclined groove 31 of the tiles 3 corresponding to them can also be any style mentioned in the above embodiments, which can be combined.

[0057] Whether it is C-shaped steel 1A or mounting baseplate 1B, it is reinforced with reinforcing ribs to increase the overall strength when subjected to shaking force or vibration force.

[0058] The above-described embodiments are merely preferred embodiments of the present invention and are not intended to limit the scope of the invention. For those skilled in the art, various changes and modifications can be made to the invention. Any modifications, equivalent substitutions, improvements, etc., made within the spirit and principles of the present invention should be included within the scope of protection of the present invention.

Claims

1. A ceramic tile hanging system, firmly attached to an installation surface, comprising mounting components and ceramic tiles; **characterized in that**

the mounting components are securely fixed on the installation surface; the mounting components include a plurality of fitting members extending upward from the top surface of the mounting components, and the fitting members are integrally formed with the mounting components;

the ceramic tiles are hung on and attached to the mounting components, with the sides of the ceramic tiles being abutted against each other; each of the ceramic tiles has an inclined groove, and the inclined groove is hooked onto and attached to the fitting members;

the inclined groove includes a first mounting portion arranged on the side away from the ceramic tile decorative surface, and a second mounting portion extending from the first mounting portion into the interior of the ceramic tile;

each of the fitting members comprises a first connecting portion extending upward from the mounting components; the first connecting portion is abutted against the first mounting portion, and a second connecting portion extending from the first connecting portion into the second mounting portion;

2. The system according to claim 1, **characterized in that** the first mounting portion is inclined; the second mounting portion is in communication with and level with the horizontal plan; the first connecting portion is fitted into the first mounting portion, and the second

connecting portion is fitted into the second mounting portion.

3. The system according to claim 1, **characterized in that** each of the fitting members further includes a third connecting portion extending from the second connecting portion into the second mounting portion. 5
4. The system according to claim 3, **characterized in that** one end of the inner side of the first mounting portion is linear, and the other end is slanted; the second mounting portion is in communication with and level with the horizontal plane; the first connecting portion is perpendicular to and abuts against the linear inner side of the first mounting portion.; the second connecting portion is perpendicular to the first connecting portion; the third connecting portion is slanted upward from the second connecting portion, or alternatively, the third connecting portion is slanted downward from the second connecting portion. 10 15 20
5. The system according to claim 3, **characterized in that** one end of the inner side of the first mounting portion is linear, and the other end is slanted; the second mounting portion is in communication with and level with the horizontal plane; the first connecting portion is perpendicular to and abuts against the linear inner side of the first mounting portion; the second connecting portion is slanted downward from the first connecting portion; the third connecting portion is slanted upward from the first connecting portion. 25 30
6. The system according to claim 3, **characterized in that** one end of the inner side of the first mounting portion is linear, and the other end is slanted; the second mounting portion is in communication with and level with the horizontal plane; the first connecting portion is perpendicular to and abuts against the linear inner side of the first mounting portion; the second connecting portion is slanted downward from the first connecting portion; the third connecting portion is slanted downward from the first connecting portion. 35 40 45
7. The system according to claim 3, **characterized in that** the first mounting portion is inclined, the second mounting portion tilts downward/upward from the first mounting portion; the first connecting portion is fitted into the first mounting portion; the second connecting portion is connected to and level with the horizontal plane; the third connecting portion is connected to upper portion or lower portion of the second connecting portion. 50 55
8. The system according to claim 3, **characterized in that** the first mounting portion is inclined, the second

mounting portion is slanted downward/upward from the first mounting portion; the first connecting portion is fitted into the first mounting portion; the second connecting portion is slanted downward from the first connecting portion; the third connecting portion is connected to upper portion or lower portion the second connecting portion.

9. The system according to claim 1, **characterized in that** the mounting component is C-shaped steel, and several fitting members are evenly spaced on the C-shaped steel; the C-shaped steel is securely fixed to the keel, and the keel is securely fixed to the installation surface.
10. The system according to claim 1, **characterized in that** the mounting component is a mounting baseplate, and several fitting members are arranged on the mounting baseplate; the mounting baseplates are securely fixed to the installation surface, or alternatively, the mounting baseplates are securely fixed to the keel, and the keel is securely fixed to the installation surface.

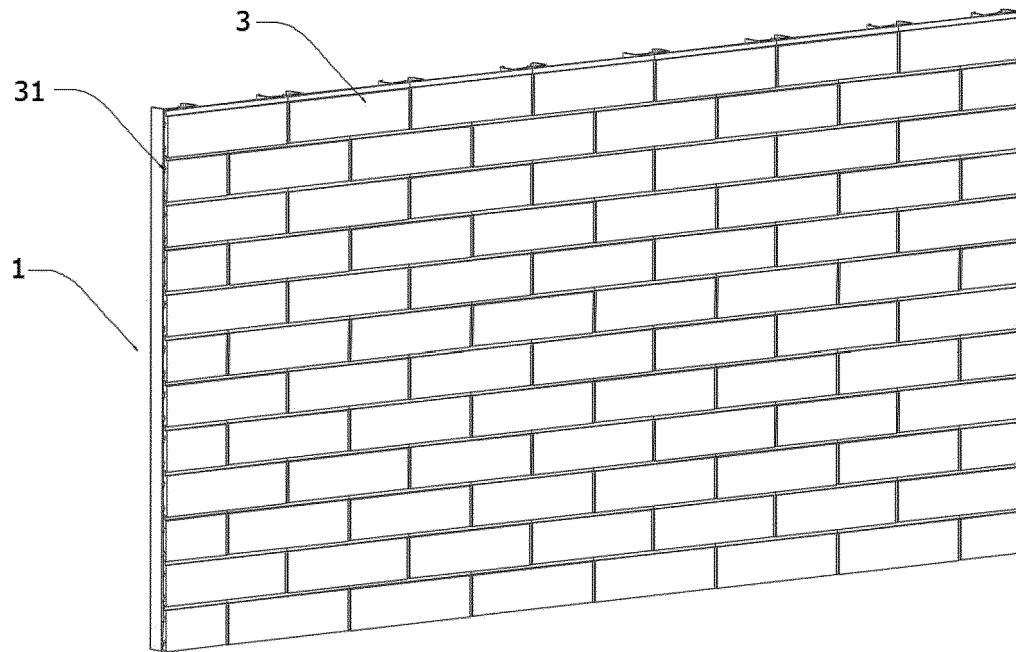


FIG. 1

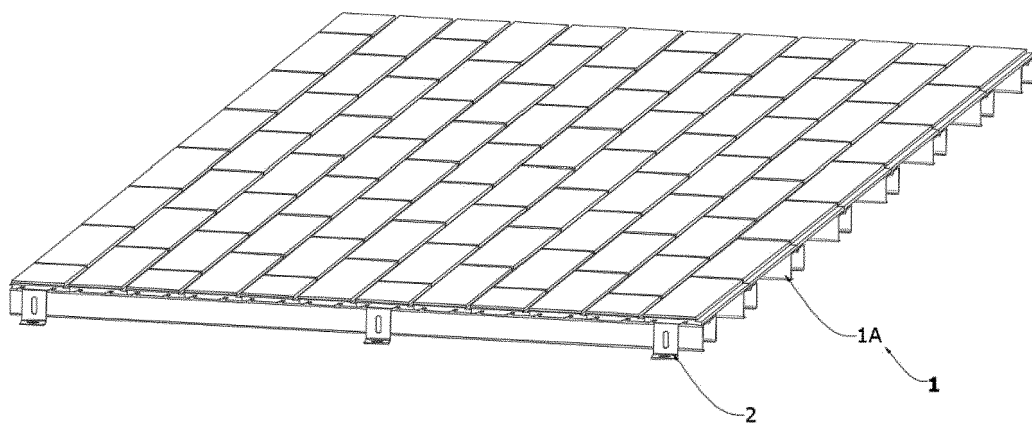


FIG. 2

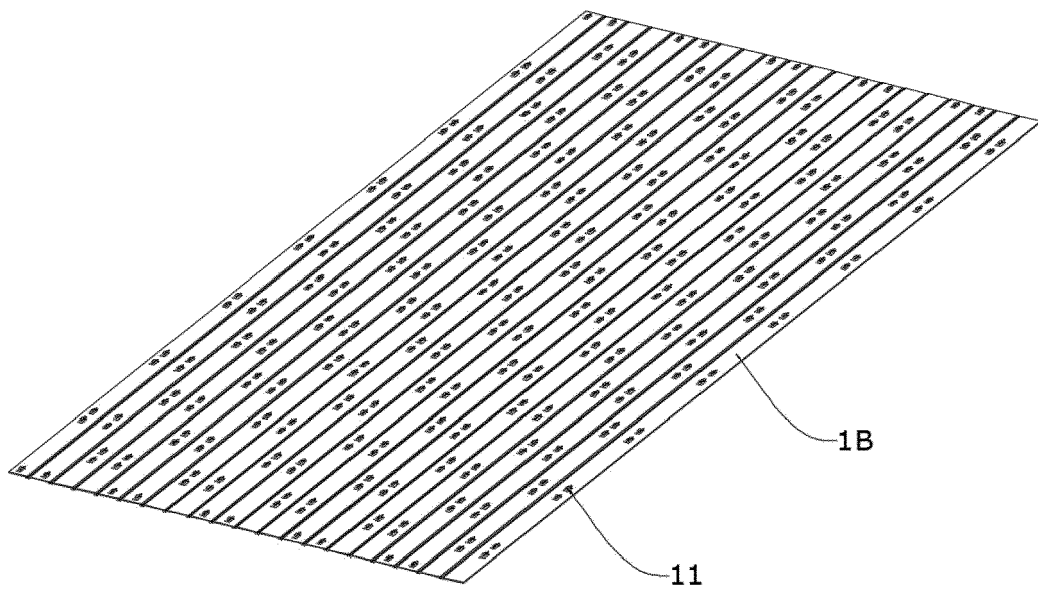


FIG. 3

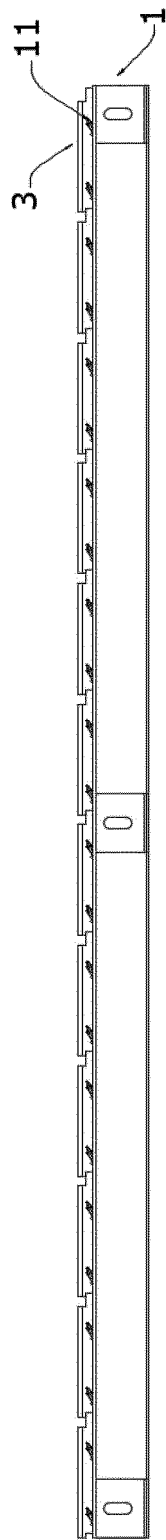


FIG. 4

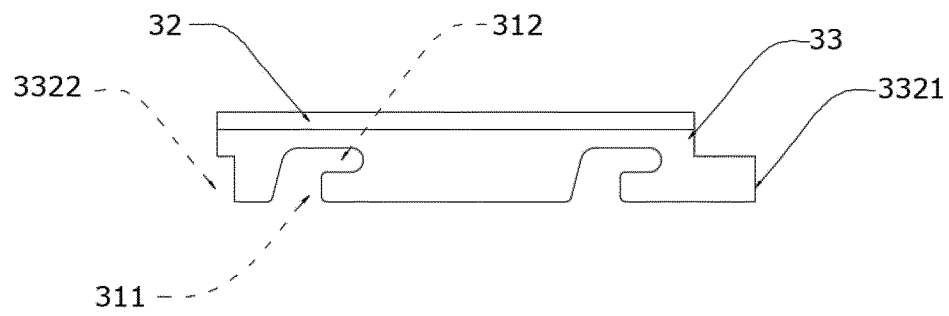


FIG. 5

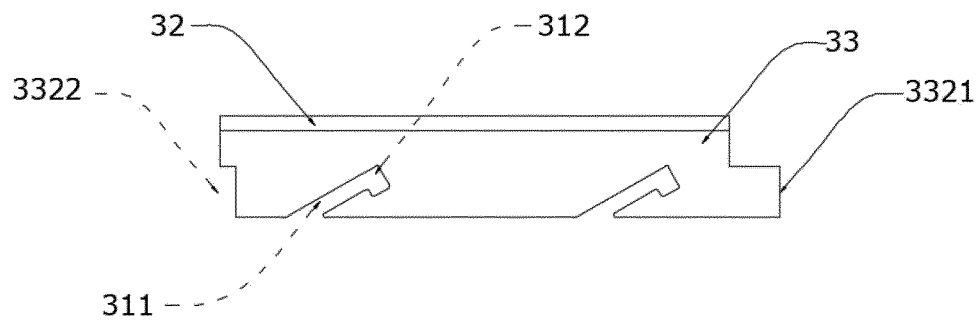


FIG. 6

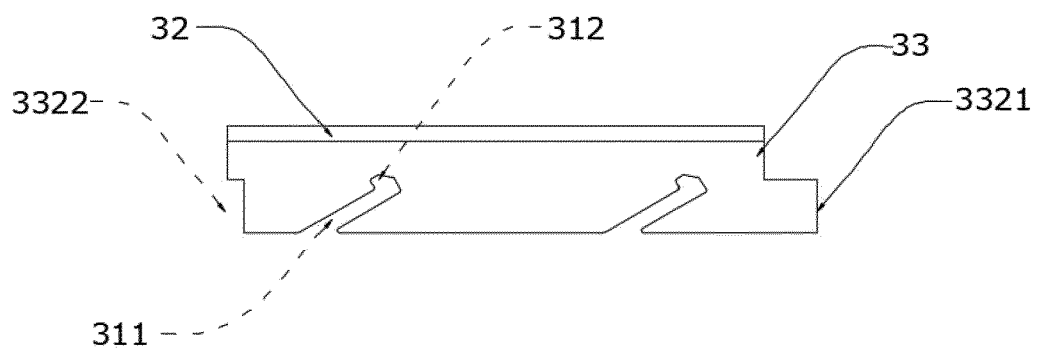


FIG. 7

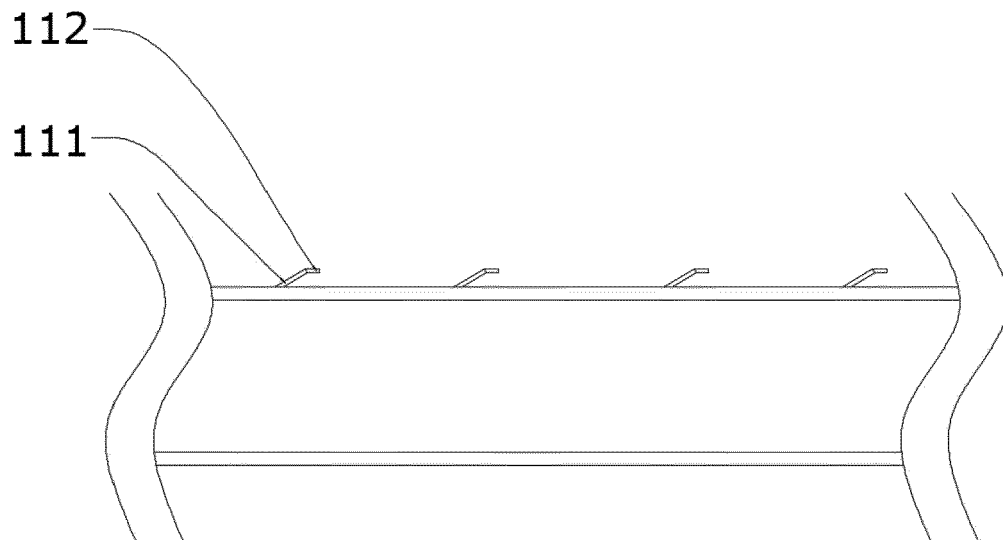


FIG. 8

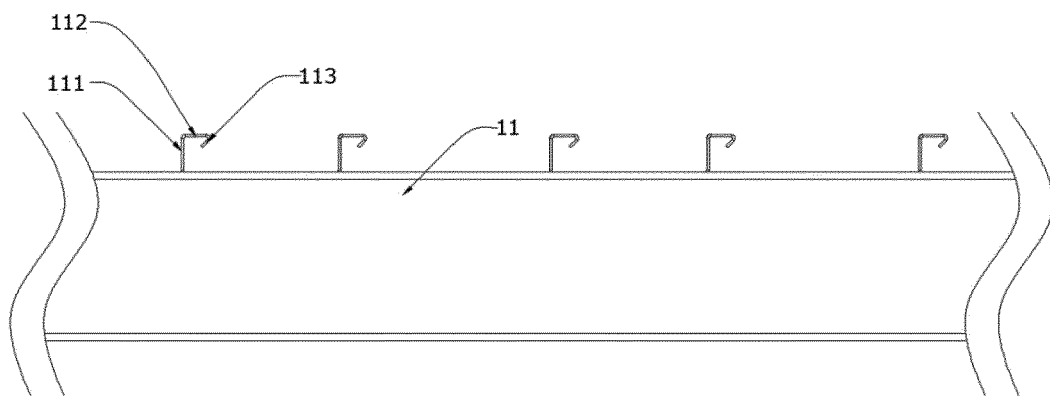


FIG. 9

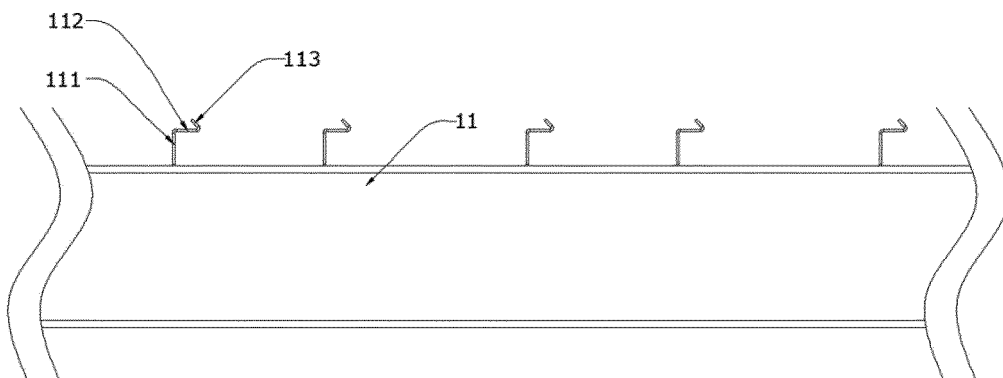


FIG. 10

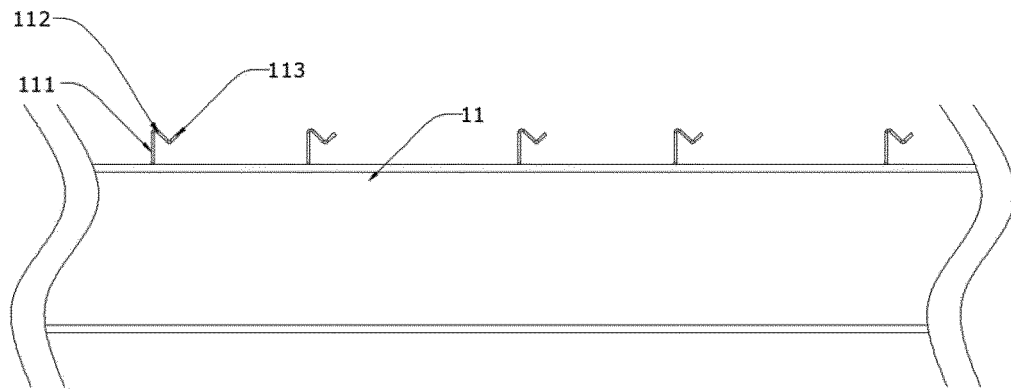


FIG. 11

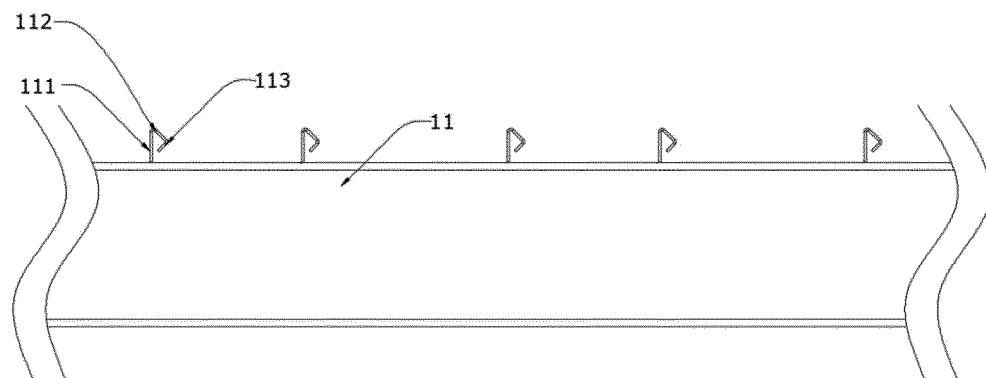


FIG. 12

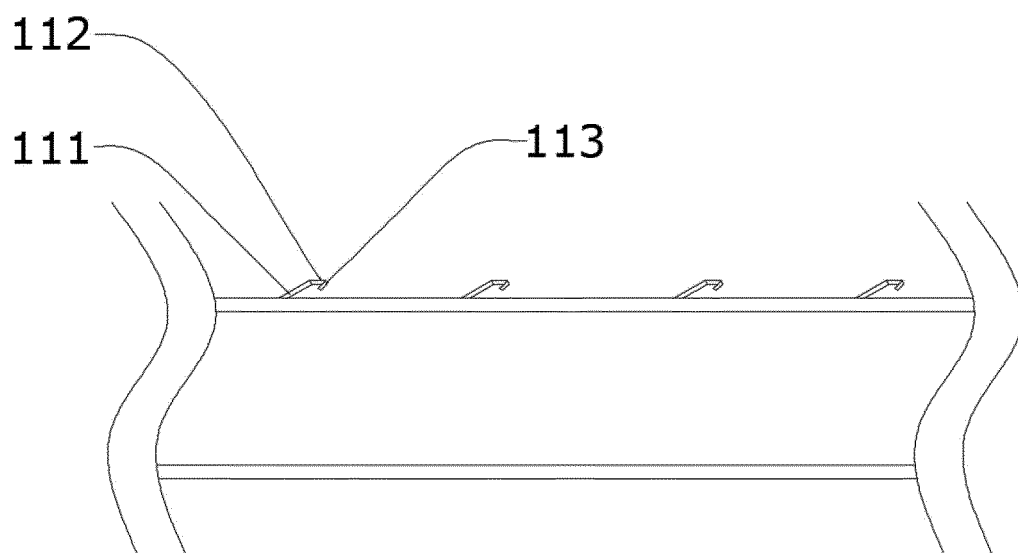


FIG. 13

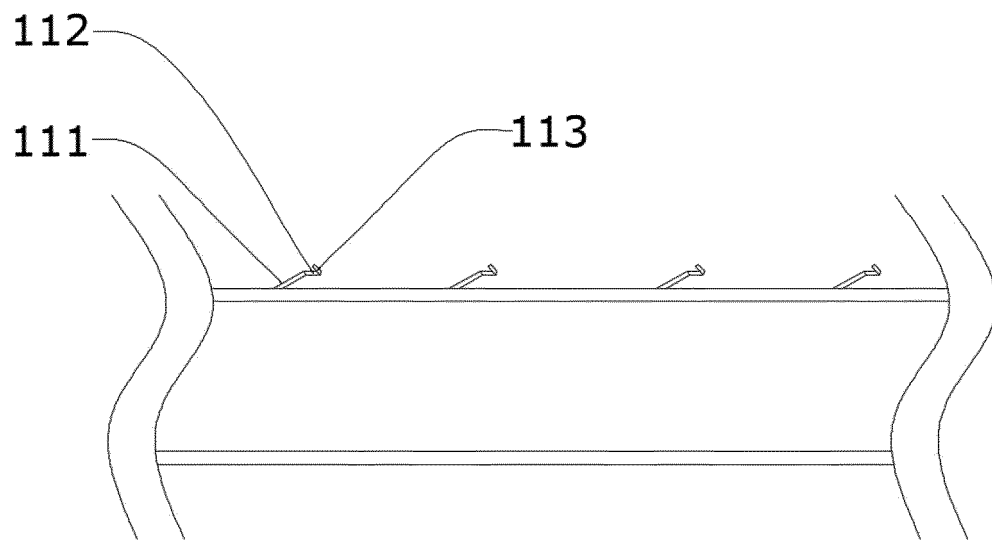


FIG. 14

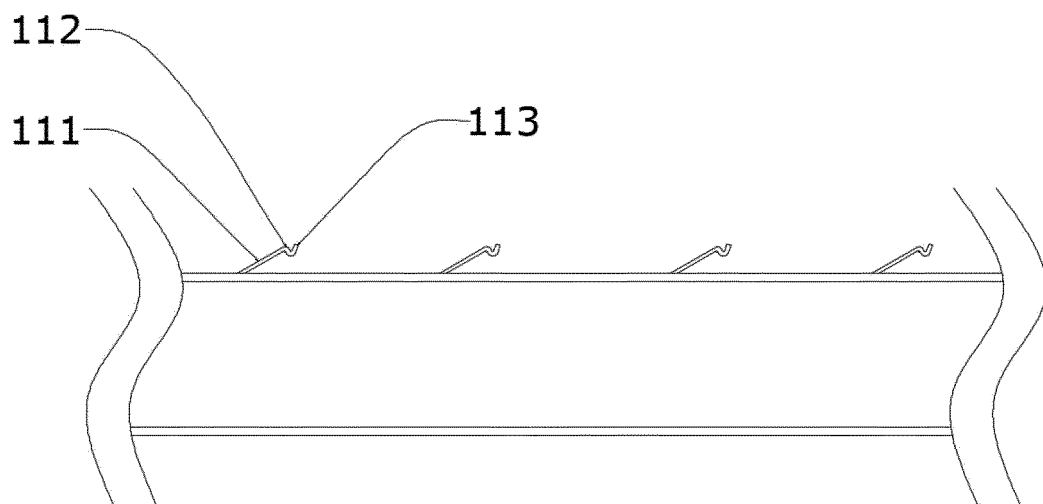


FIG. 15

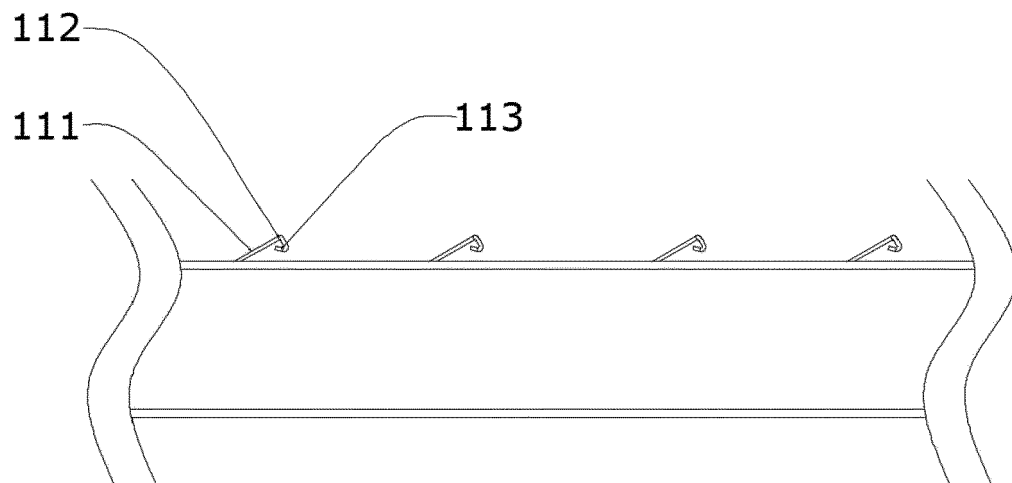


FIG. 16