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(54) **ALUMINUM FIRE-RESISTANT HONEY
COMB-SHAPED PLATE AND ITS
MANUFACTURING METHOD**

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(57) **ABSTRACT**

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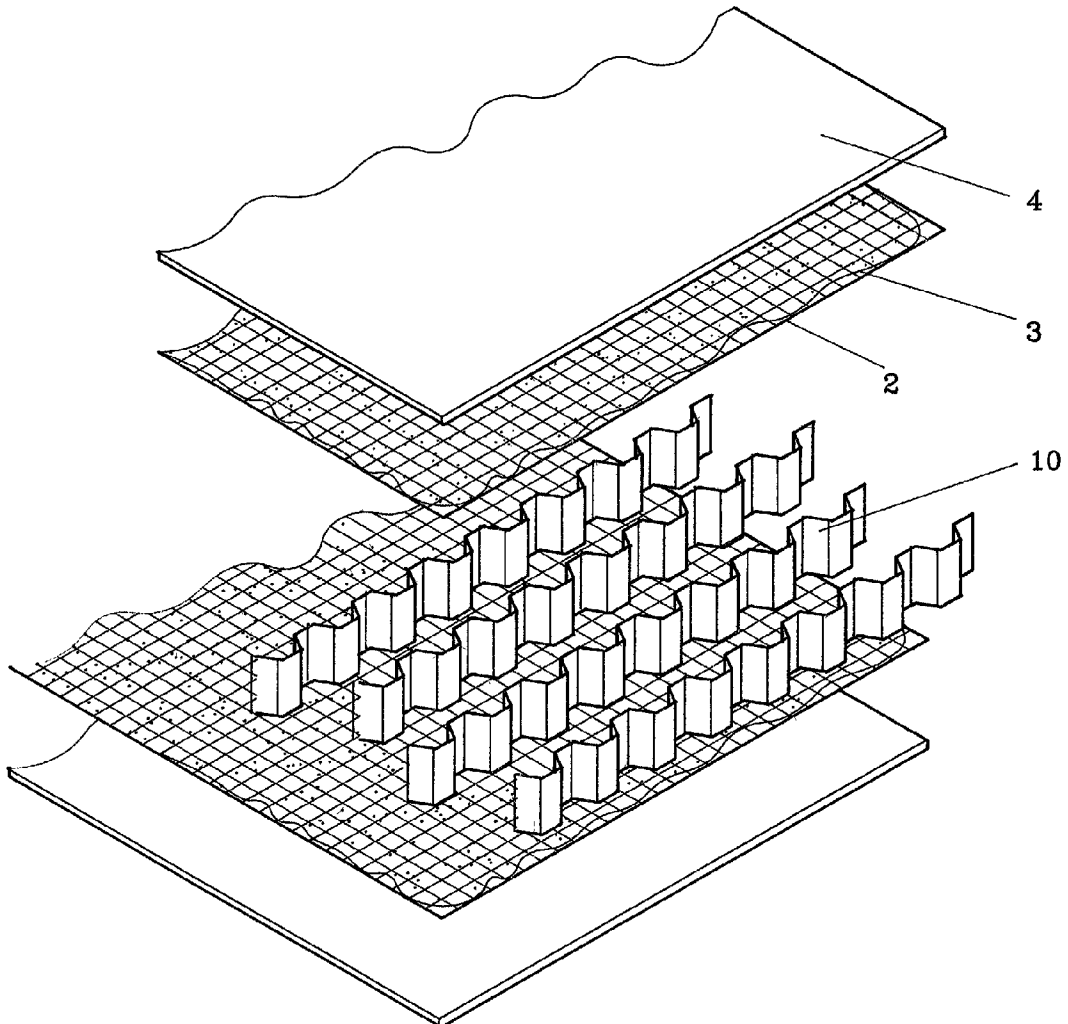
An aluminum fire-resistant honeycomb-shaped plate and its manufacturing method includes an aluminum intermediate honeycomb-shaped layer, a layer of gauze adhered respectively on an upper and a lower surface of the intermediate honeycomb-shaped layer, an outer solid aluminum plate adhered respectively on an outer surface of each layer of gauze. The gauze endures high temperature and percolates air. Then the outer surface of each outer solid aluminum plate is anodized with a layer of a chemical to prevent it from getting rusted and then sprayed with a layer of silicon glue to increase hardness of the outer surfaces and beautiful appearance.

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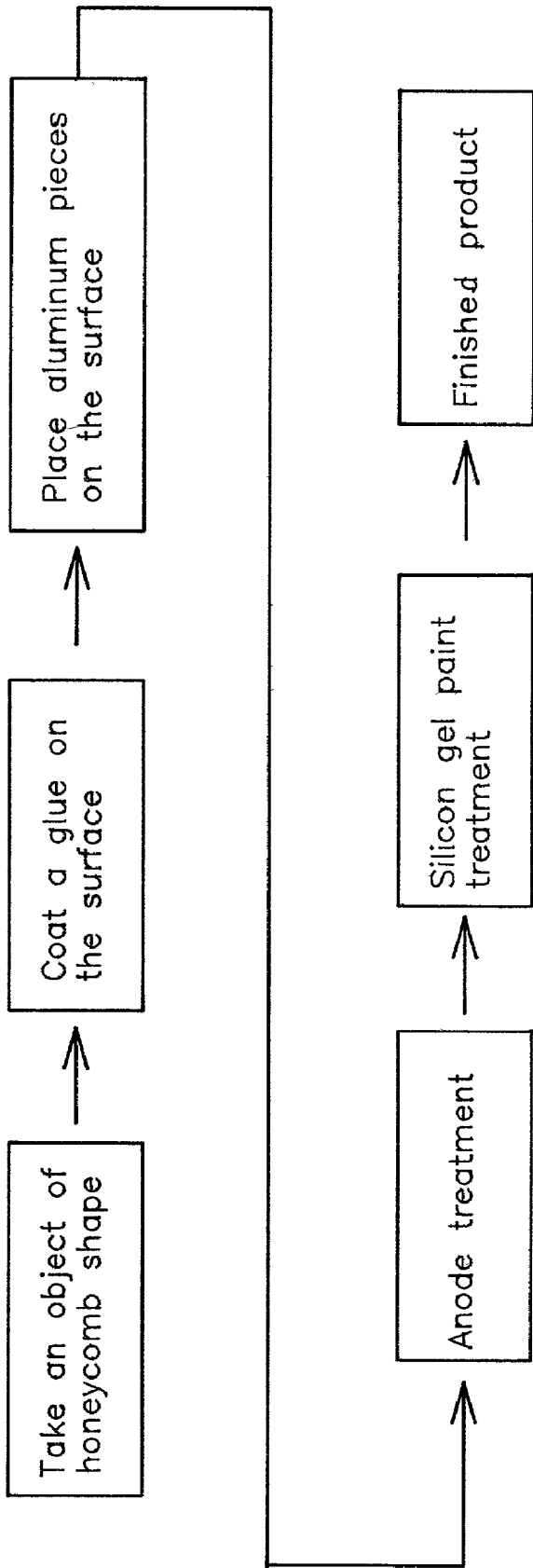
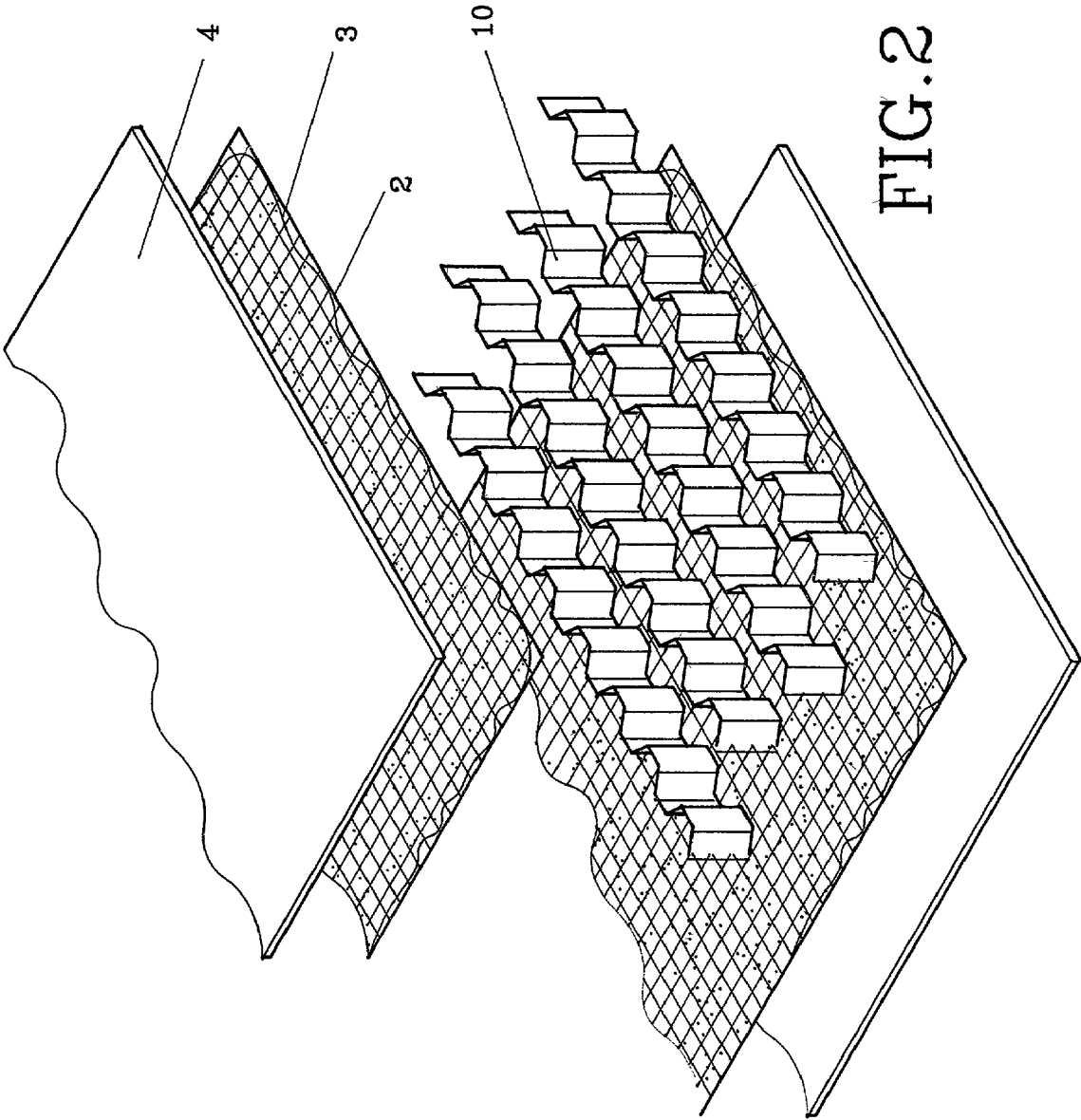


FIG.1



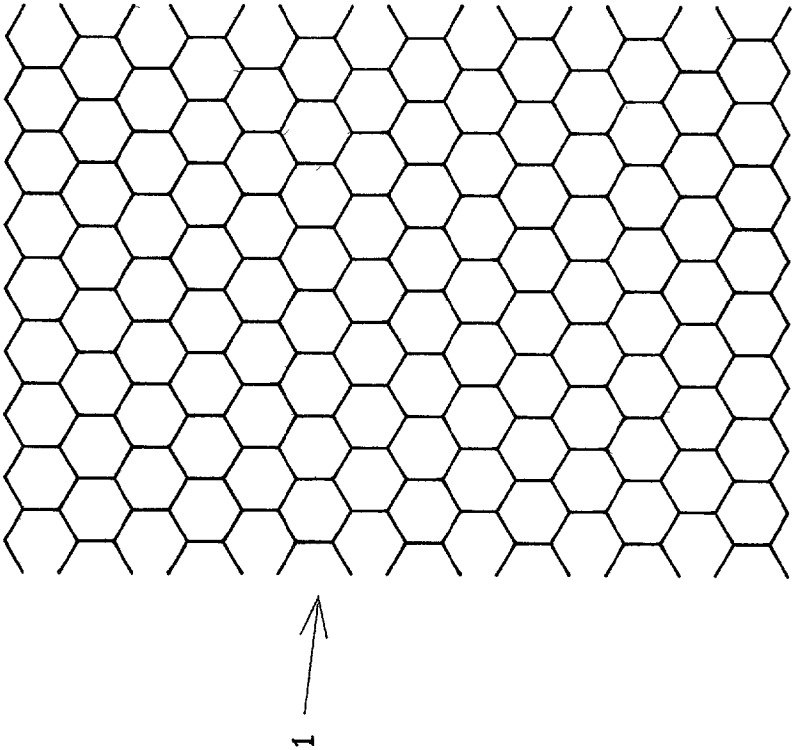


FIG. 3

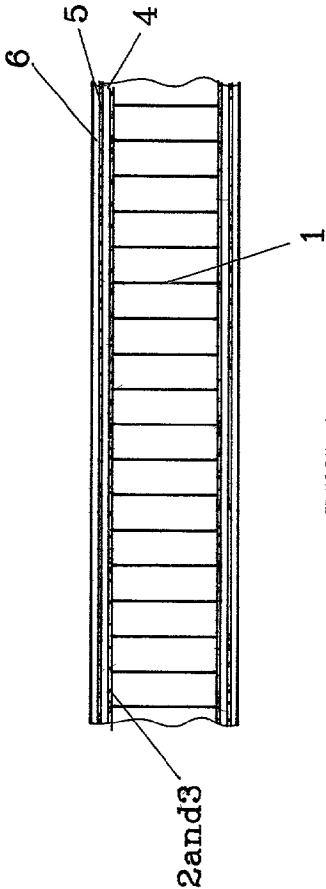


FIG. 4

ALUMINUM FIRE-RESISTANT HONEYCOMB-SHAPED PLATE AND ITS MANUFACTURING METHOD

BACKGROUND OF THE INVENTION

[0001] This invention relates to an aluminum fire-resistant honeycomb-shaped plate and its manufacturing method, particularly to one having light, rustproof, fire-resistant, sound-insulating, hitting-enduring, and vibration-enduring properties, possible to be applied to separating walls of buildings, houses, etc.

[0002] The aluminum fire-resistant honeycomb-shaped plate in the invention has a certain toughness and hardness in spite of lightness, and can endure vibration of an earthquake and not collapse or break down even if used in walls of high-rise buildings, keeping people therein from wounded, injured or died. But traditional plastic or wood used for separating walls cannot endure long or resist fires as the aluminum plate in the invention. In addition, much forests have to be destroyed to get wood, worsening largely ecological environment, and as for plastic, it gives out toxic to pollute air when burned, and not biodegradable if it is discarded and buried in the ground, also bad to our living environment. On the contrary, aluminum can be recycled, helpful to maintain our living environment clean, and also lower possibility of fires from happening much less frequent than wood or plastic.

SUMMARY OF THE INVENTION

[0003] This invention has been devised to offer an aluminum fire-resistant honeycomb plate and its manufacturing method, made of two aluminum plates sandwiching a honeycomb-shaped aluminum layer between, reducing its weight 85% less than common solid aluminum plates, resulting in lower cost. Its manufacturing method produces it with automation, lessening the number of workers needed as less as possible.

[0004] So expenditure for using the material in the invention as separating walls in buildings may be almost the same as using wood for separating walls.

[0005] One feature of the invention is two outer layers of aluminum fire-resistant plates treated with anodizing process so that the two outer layers may not drop off or erode even if they receive rain or daylight frequently.

[0006] Another feature of the invention is an intermediate honeycomb-shaped aluminum layer sandwiched between the two outer solid aluminum plates so as to lighten the weight of the whole aluminum plate, having strong structure, hitting-enduring earthquake-enduring, fire-resistant, enduring and sound-insulating properties.

[0007] The manufacturing method of the aluminum fire-resistant honeycomb plate includes several steps shown below.

[0008] Step 1 of making a honeycomb-shaped layer: Place innumerable small aluminum wave-bent elongate strips into a machine to make an aluminum honeycomb-shaped layer.

[0009] Step 2 of coating a layer of glue: Place a layer of gauge on the two outer surface of the honeycomb layer, and then add a layer of adhesive on the layer

of gauge so as to completely adhere the layer of gauge on the honeycomb-shaped layer.

[0010] Step 3 of placing two aluminum plates: place and adhere two solid aluminum plates on the two side surfaces of the honeycomb layer by using the same process used in the step 2.

[0011] Step 4 of anodizing treatment: anodize the outer surfaces of the two outer aluminum plates with a chemical, preventing them from getting rusted.

[0012] Step 5 of spraying a layer of silicon glue: Spray a layer of colored silicon glue on the outer surfaces of the aluminum plate finished the step 4, increasing hardness of its outer strength and beauty.

BRIEF DESCRIPTION OF DRAWINGS

[0013] This invention will be better understood by referring to the accompanying drawings, wherein:

[0014] FIG. 1 is a block diagram of a manufacturing method of an aluminum fire-resistant honeycomb-shaped plate in the present invention:

[0015] FIG. 2 is an exploded perspective view of the aluminum fire-resistant honeycomb-shaped plate in the present invention:

[0016] FIG. 3 is an upper view of an aluminum honeycomb-shaped layer in the present invention:

[0017] FIG. 4 is a side view of the aluminum fire-resistant honeycomb-shaped plate in the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0018] A preferred embodiment of an aluminum fire-resistant honeycomb plate in the present invention, as shown in FIGS. 1-4, includes an aluminum intermediate honeycomb shaped layer 1, two layers of gauge 2 respectively adhered on two side surfaces of the intermediate honeycomb shaped layer 1, and two outer solid aluminum plates 4 respectively adhered on the two gauge layers.

[0019] The aluminum intermediate honeycomb-shaped layer 1 is made of a plurality of wave-bent elongate aluminum strips 10 adhered with one another in separated points mode with an automatic machine.

[0020] The two gauge layers 2 are respectively adhered on an upper and a lower side of the intermediate honeycomb shaped layer 1, having high-temperature-resistant and percolating property.

[0021] The two solid aluminum plates 4 are respectively adhered on an outer surface of each gauge layer 2.

[0022] Further, the outer surfaces of the two solid aluminum plates 4 are coated with a layer of a chemical 5 by means of anodizing to prevent the aluminum plates 4 from getting rusted, and then the whole aluminum fire-resistant honeycomb-shaped plate is sprayed to have a layer of silicon glue 6 of a color to increase hardness of the outer surfaces and the outer beautiful appearance. Then the aluminum fire-resistant honeycomb-shaped plate in the invention has very high fire-resistant property, not liable to get eroded, and large roughness, excellent earthquake enduring buffer strength due to the small elongate aluminum strips forming

a honeycomb shape. In addition, the two outer solid aluminum plates 4 have hard outer surfaces to endure hitting by means of a layer of silicon glue 6.

[0023] Next, the manufacturing method of the aluminum fire-resistant honeycomb-shaped plate has five steps described below.

[0024] A first step is to make an aluminum honeycomb-shaped layer by preparing a plurality of wave-bent elongate aluminum strips and then adhered one another with glue with an automatic machine:

[0025] A second step is to adhere a layer of gauze respectively on an upper and a lower surface of the aluminum honeycomb-shaped layer, said gauze possible to endure high temperature and percolate air.

[0026] A third step is to adhere a solid aluminum plate respectively on the upper and the lower surface of the two layers of gauze.

[0027] A fourth step is to coat a layer of a chemical by means of anodizing process on an outer surface of each of the two solid aluminum plates to prevent them from getting

[0028] A fifth step is to spray a layer of silicon glue of a color on the whole outer surface of the aluminum fire-resistant honeycomb-shaped plate to augment hardness of its outer surface and beautiful appearance.

[0029] While the preferred embodiment of an aluminum fire-resistant honeycomb-shaped plate and its manufacturing method are described above, it will be recognized and understood that various modifications may be made therein and the appended claims are intended to cover all such modifications that may fall within the spirit and scope of the invention.

I claim:

1. An aluminum fire-resistant honeycomb-shaped plate for separating walls comprising:

an aluminum intermediate honeycomb-shaped layer consisting of a plurality of wave-bent elongate aluminum strips adhered with one another:

a layer of gauze adhered respectively on an upper and a lower surface of said aluminum intermediate honeycomb-shaped layer:

a solid aluminum plate adhered respectively on an outer surface of each said layer of gauze:

an outer surface of each said solid aluminum plate anodized and sprayed with a layer of silicon glue so that said aluminum fire-resistant honeycomb-shaped plate may be light, fire-resistant, sound-insulating, hitting-enduring, and earthquake-enduring.

2. A manufacturing method of an aluminum fire-resistant honeycomb-shaped plate for separating walls comprising:

a first step of making an aluminum honeycomb-shaped layer by preparing a plurality of wave-bent elongate aluminum strips and then adhered one another with glue with an automatic machine:

a second step of adhering a layer of gauze respectively on an upper and a lower surface of the aluminum honeycomb-shaped layer, said gauze possible to endure high temperature and percolate air.

a third step of adhering a solid aluminum plate respectively on the upper and the lower surface of the two layers of gauze.

a fourth step of coating a layer of a chemical by means of anodizing process on an outer surface of each of the two solid aluminum plates to prevent them from getting rusted.

a fifth step of spraying a layer of silicon glue of a color on the whole outer surface of the aluminum fire-resistant honeycomb-shaped plate to augment hardness of its outer surface and beautiful appearance.

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