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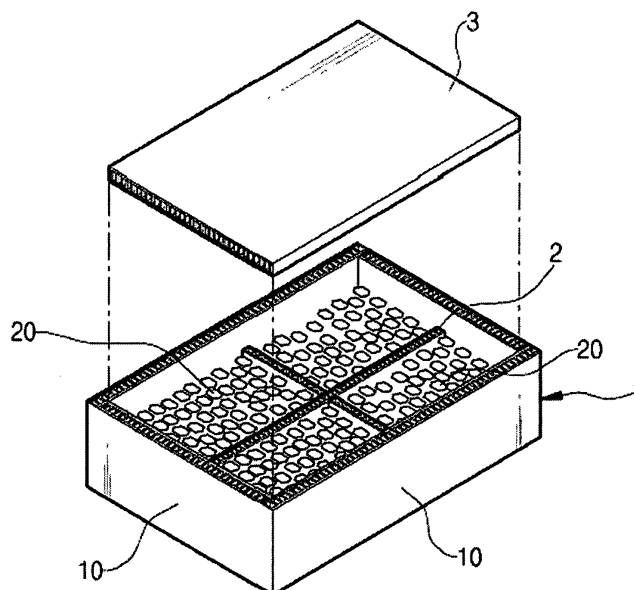
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(54) **Sound insulating panel structure**

(57) To provide a good sound insulating panel structure having a light weight and a simple structure, the present device provides a sound insulating panel structure characterized by being constituted by filling one or more kinds of light filling materials in the inner space (depressed inner space) of a rectangular sound absorbing

box constituted of a sound insulating material of surface plate in the shape of a plate or a side having many holes or slits within, whose one side is open; closing the one side with a cover constituted of a sound insulating material of surface plate; and sealing the one side by pouring bubble including cement coating layer on the cover.

Fig. 1



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Description

[Technical Field]

[0001] The present device relates to a soundproofing wall for silencing the noise by diffusing and interfering with various noises generated from a factory, cars on the road, or general consumer devices.

[Background Art]

[0002] People cannot enjoy comfortable business or living environment, and thus are under stress, due to generation of various noises. To solve this problem, various sound-insulating walls are being invented. However, most of these sound-insulating walls are composed of a simple double wall, and thus cannot sufficiently absorb or insulate the sounds.

[0003] Therefore, means for extinguishing the noise have been invented, but they have very complicated structures, and cannot sufficiently absorb the sound, and therefore, cannot absorb the sound as expected. Also, these conventional means have problems that the manufacturing thereof is very difficult, and has difficulties in being used as a structural wall. Therefore, the present device has been made in view of the above problems.

[Technical Solution]

[0004] It is an object of the present device to provide a sound absorbing wall for completely extinguishing the noise with a simple structure that can be easily constructed as a building material. It is another object of the present device to provide an excellent sound insulating panel structure having a light weight.

[Advantageous Effects]

[0005] The present device has a good sound insulating rate according to the increased volume of the holes formed inside the material constituting the structure such as the sound insulating material of surface plate, light filling material and bubble cement, and thus has excellent noise preventing effects.

[0006] That is, the generated sound or vibration is confined inside the sound insulating panel structure of the present device by the light filling material and the sound insulating material of surface plate, and thereby cannot be transmitted to the outside.

[Description of the Drawings]

[0007] The above and other objects, features and other advantages of the present device will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

Fig. 1 shows the constitution of the present device

constituted of a rectangular sound absorbing box and a cover.

Fig. 2 is a perspective view of the sound insulating panel structure of the present device completed by pouring bubble including cement on the cover.

Fig. 3 is a front view of the sound insulating panel structure of the present device.

Fig. 4 is a diagram of the sound insulating material of surface plate.

Fig. 5 is a magnification of the light filling material.

Explanation of Reference Numerals:

[0008]

1: rectangular sound absorbing box 2: partition

3: cover 4: cement layer

5: support of the cement layer

10: sound insulating material of surface plate 11: surface plate partition

20: light filling material

[Best Mode]

[0009] The present device will be explained in detail with reference with the attached drawings as follows.

[0010] Fig. 1 shows the constitution of the present device. The present device provides a sound insulating material characterized by filling one or more kinds of light filling materials (20) in the inner space (depressed inner space) of a rectangular sound absorbing box (1), in which the side wall and the bottom surface are constituted of a sound insulating material of surface plate (10) in the shape of a plate or a side having many holes or slits formed therein, and one side of the cover surface is open; closing the one side with a cover (3) constituted of a sound insulating material of surface plate (10); and sealing the one side by pouring bubble including cement coating layer (4) on the cover (3)

[0011] The sound insulating material of surface plate (10) has many slits formed inside, and thus has an air layer preventing the transmission of the sound or vibration formed in itself, and therefore, can become an excellent material having good durability and a low density. Since the present device is constituted of such a sound insulating material of surface plate, it can be used as a hard building material preventing the transmission of the sound or vibration.

[0012] It is preferable that the inner space of the sound insulating panel structure be divided by partitions (2). Also, it is preferable that plural partitions (2) be installed inside the rectangular sound absorbing box (1) and thereby many cells be formed inside the sound insulating panel structure of the present device, as shown in Fig. 1. Such a constitution provides durability for the sound insulating panel structure and prevents the transmission of the sound or vibration. That is, the generated sound or vibration collides with the partitions (2) and thereby is con-

fined within the cell and cannot go out of the cell.

[0013] Fig. 2 shows the sound insulating structure completed by forming a cement layer (4) by pouring cement after covering with a cover (3). The bubble including cement includes porous bubbles and thus is light, is manufactured as a mortar and is poured on one side of the sound absorbing material to improve the sound insulating capacity. When the rectangular sound absorbing box is closed with the cover (3), the cover should be pushed down from the above to make the cover be pushed downward from the upper end of the side wall of the rectangular sound absorbing box (1) in a predetermined depth. Then, the bubble including cement is poured up to the height of the side wall of the sound absorbing box (1), making the upper end of the cement layer conform to the upper end of the side wall, and thereby one sound insulating panel structure is sealed and completed simultaneously.

[0014] The sound insulating panel structures of the present device completed in this manner is constructed in a building by being arranged successively, when used practically, as shown in Fig. 2. When the sound insulating panel structures are constructed in this manner, the cells confining generated sound or vibration inside the sound insulating panel are consecutively arranged as shown in Fig. 1, and thereby sound insulating effects of numberless steps can be achieved.

[0015] Fig. 3 is a front view of the sound insulating panel structure, and shows how the cover (3) and the cement layer (4) are formed. Also, Fig. 3 shows a support (5) for supporting the cement layer. An iron wire is laid on the bottom surface of the rectangular sound absorbing box (1) through a hole formed in the sound insulating material of surface plate constituting the bottom surface, passes through the inside of the rectangular sound absorbing box (1) filled with light member (20), passes through the hole covered in the cover (3) and is concealed inside the cement layer. Such a constitution prevents the cement layer (4) formed on the cover from being separated and broken away from the completed sound insulating panel structure.

[0016] Fig. 4 is a diagram of the sound insulating material of surface plate (10). The inner space of the sound insulating material of surface plate is divided by many surface plate partitions (11), preferably long and thin, and thereby holes or slits are formed in the surface plate itself. It is preferable that the rectangular sound absorbing box (1) and the cover (3) constituting the present device are all composed of such a sound insulating material of surface plate.

[0017] Fig. 5 is one embodiment of the light filling material (20) filled inside the rectangular sound absorbing box (1), and shows a fragment in the shape of a ground cherry cut off from a PVC pipe. The PVC pipe fragment is obtained by cutting off a synthetic resin pipe such as a PVC. If the pipe is pressurized and pushed, right before being cut off, the air inside the pipe is pushed, and thereby light pipe fragments having air filled inside are formed. The process of cutting off a pipe is performed right after

the production line of the pipe, to make it easy to pressurize and push the pipe. The pipe fragments in the shape of a ground cherry produced in this manner has a low density and is excellent durability against the external shock, since the inside thereof is fully filled with air pressure.

[0018] As light filling material, not only the aforesaid synthetic resin pipe fragments in the shape of a ground cherry, but also the materials that have a light weight and can intercept the transmission of the sound, by including bubbles within can be used.

[0019] It is preferable that the light filling materials be fully filled inside the rectangular sound absorbing box (1), without leaving any space. Then, after the rectangular sound absorbing box is closely closed with a cover (3), cement is poured thereon.

[0020] On the other hand, the present device provides a constitution that does not include a cover (3) as another embodiment. The cover (3) is used to make it easy to pour cement on the light filling material filled inside the rectangular sound absorbing box. Therefore, if the light filling material is a material having a predetermined shape, it is possible to pour a cement layer on the light filling material without using a cover.

[0021] The sound insulating panel structure of the present device has a density of 15~25Kg/m³.

Claims

1. An sound insulating material **characterized by** filling one or more kinds of light filling materials (20) in the inner space (depressed inner space) of a rectangular sound absorbing box (1), in which the side wall and the bottom surface are constituted of a sound insulating material of surface plate (10) in the shape of a plate or a side having many holes or slits formed within, and one side of the cover surface is open; closing the one side with a cover (3) constituted of a sound insulating material of surface plate (10); and sealing the one side by pouring bubble including cement coating layer (4) on the cover (3).
2. The sound insulating panel structure according to Claim 2, wherein the light filling material (20) is a PVC pipe fragment (20) in the shape of a ground cherry including air inside.
3. The sound insulating panel structure according to Claim 1, wherein the inside of the sound insulating material of surface plate (10) is divided by plural surface plate partitions (11).
4. A sound insulating structure comprising a box having walls whose interiors have multiple spaces, the box containing sound insulating filling material and being closed by a further wall formed of, or sealed by, bubble cement.

Fig. 1

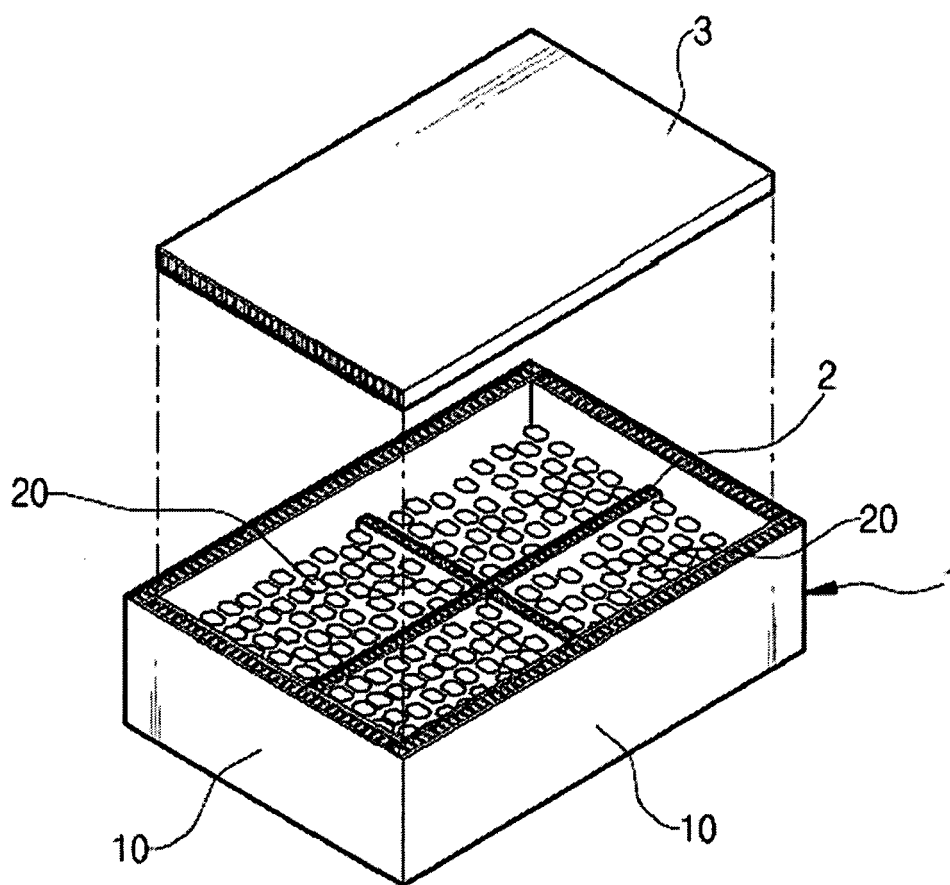


Fig. 2

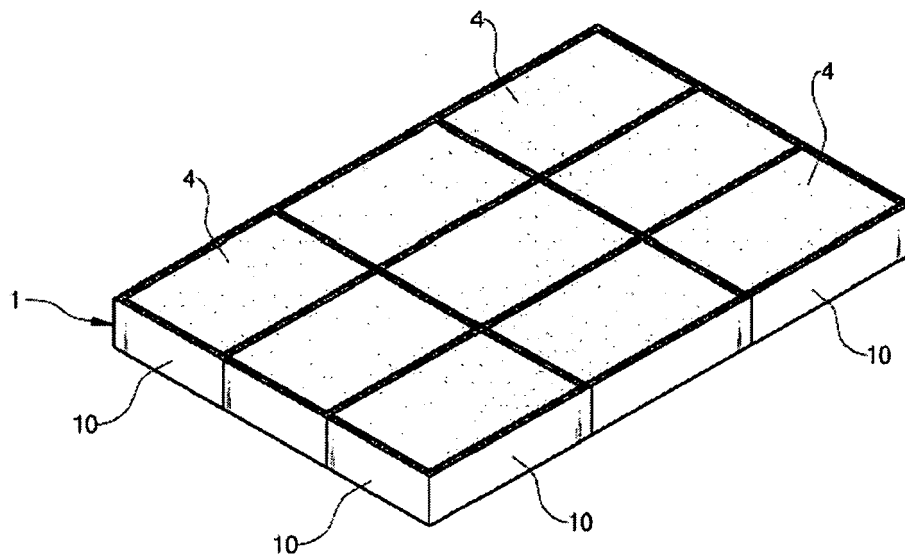


Fig. 3

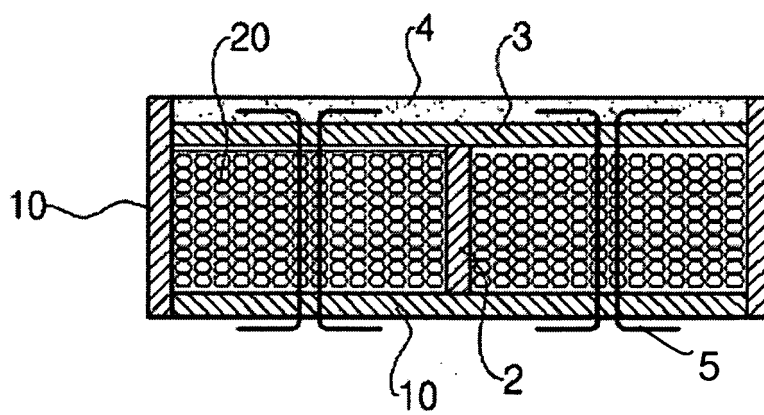


Fig. 4

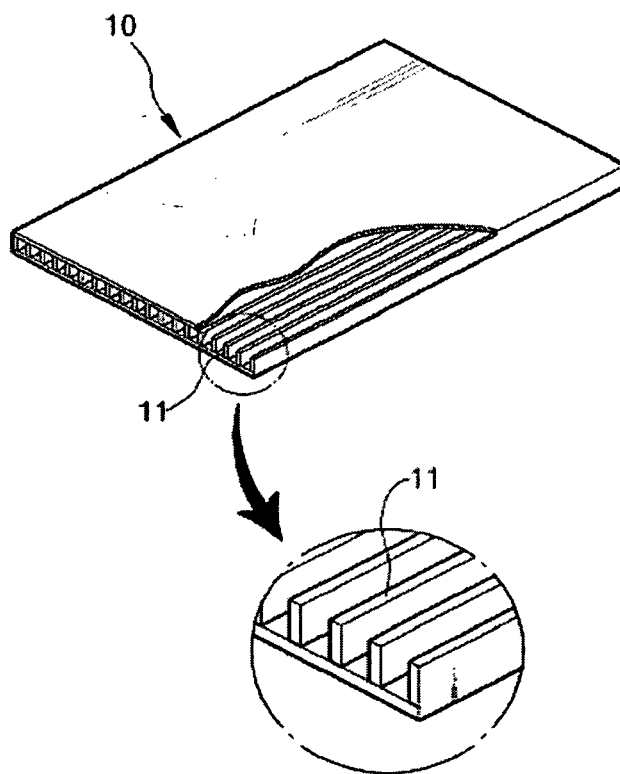


Fig. 5

