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(54) **Sound-damping wall for arrangement alongside a railroad or highway**

Lärmschutzwand zum anordnen entlang einer Eisenbahn oder Autobahn

Mur anti-bruit pour arrangement à coté d'un chemin de fer ou autoroute

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Description

[0001] The invention relates to a sound-damping wall for arrangement alongside a railroad or highway as described in the preamble of claim 1.

[0002] Such a sound-damping wall is known by DE-A-40 07 990. In case of this known wall the receiving as well as the protruding portion of the transverse walls are in the shape of a trapezoid.

[0003] Now the object of the invention is to obtain a more stable construction of such a wall which is composed of rectangular panels.

[0004] According to the invention this is obtained by using the features indicated in the characterizing portion of claim 1.

[0005] By executing the receiving portion and the protruding portion in the way as indicated the protruding portion is fixedly received in the C-shaped portion. Owing to this said panels can not be pulled apart. Nevertheless it is possible that the longitudinal planes of subsequent panels are making an angle with each other.

[0006] By providing the transverse walls of a panel with aligned openings through which an elongated member can be slid the panels can offer more resistance to the wind load or another load.

[0007] In this case in particular the features according to claim 2 can be applied.

[0008] It is referred to DE 80 23 207 U showing a sound-damping wall comprised of panels the transverse walls of which each are provided with protruding portions which are not shaped such that a stiff connection between subsequent panels can be obtained. The protruding portions only embrace each other partly.

[0009] For stiffening the longitudinal walls of a panel so that it can have a considerable width, one can mount at least one secondary transverse wall between the transverse walls being square to the longitudinal walls and being connected with them.

[0010] According to an embodiment, the transverse walls can form an angle between 2 and 10° to a plane square to the longitudinal walls, in such a way that they enclose a sharp angle between each other. In particular, the angle between a transverse wall and the plane square to the longitudinal walls will be approximately 5°.

[0011] In this way, it is achieved that in one position, a normal flat wall will arise in that the angular rotations of the transverse walls compensate each other. In the other position, the longitudinal walls of subsequent panels will enclose an angle. Due to this, a bent screen can be obtained.

[0012] If one standard panel would be applied, it will be necessary that both longitudinal walls are provided with a perforation. If one wishes that only one transverse wall will be provided with a perforation, two differently executed panels will have to be applied. Naturally, this will have to be taken into account on mounting.

[0013] As already remarked for obtaining a firm connection between the mutually connected panels, the

subsequent transverse walls are provided with a number of aligned openings through which an elongated member being square to said transverse walls can be slid.

5 **[0014]** Preferably, the openings will be in the shape of slots being transversely to the longitudinal direction of the transverse wall and extending up to the longitudinal walls of the panel and the elongated member will be a strip. The strip will then almost lie against the inner side of the longitudinal walls.

10 **[0015]** The strips will cause the subsequent panels to lie exactly in one plane. Therefore, the tolerances in the dimensions of the engaging portions of the panels can be accommodated. At the same time the strips will serve for absorbing the transverse forces, such as exerted by the wind, acting on the panels. Due to this, overload of the connecting elements of said panels and bending of an assembly of sheets can be prevented.

15 **[0016]** By applying the strips also the upper edges of a number of mutually connected panels are aligned so that an esthetic unity is obtained. The position of such an assembly can also be adapted when the foundation of a number of such assemblies on one location would be slightly more subsided than on another location.

20 **[0017]** For securing a vertical wall to the ground, one can use posts which are anchored to the ground and which are designed such that they can be received in the cavity of a panel. The posts will generally be made of metal and are, after mounting panels thereon, invisible from the outside and protected against weather influences. Due to this, grounding of the metal parts may be unnecessary.

25 **[0018]** Apart from extending in longitudinal direction, the panels can also extend in horizontal direction such as for establishing a sound screen over a railroad or highway, in which the sound screen is curved upwards over a road. In that case, the transverse walls of the panels will have to be supported by constructional elements enclosing them. Said elements can be anchored to the ground.

30 **[0019]** According to an embodiment of the invention, the panels can be partly or completely filled with a sound-absorbing material, such as in the form of mineral wool.

35 **[0020]** When the one longitudinal wall of a panel is not provided with perforations, the sound-absorbing material can be applied on this wall.

40 **[0021]** The sound-absorbing material can also be a substrate suitable for having plants grown therein. This can improve the appearance of the screen.

45 **[0022]** It is also possible, to mount a partition wall in a panel, said partition wall being parallel to the longitudinal walls of the panel and being provided with a layer of sound-absorbing material on at least one side.

50 **[0023]** In case of application alongside a railroad or a highway, with loose ground, it may be desirable to damp the vibrations being transmitted to the environment through the ground. In order to achieve this, it is possible

to mount the sound damping screen according to the invention across a certain height into the ground. Then, the downwardly facing cavities of the panels will naturally be sealed-off, so that no ground can penetrate into them. Additionally, it may be desirable to seal off the cavities at the top side to prevent ground from getting into it.

[0024] In that case, the wall can also serve as earth-retaining structure and not be intended only for absorbing vibrations. In general, then only one longitudinal wall will be provided with a perforation.

[0025] The invention is further explained by way of an embodiment, shown in the drawing, in which:

fig. 1 shows a view of a part of a sound-damping wall according to the present invention, formed by a number of panels, with only two of them being shown, one of them partly;

fig. 2 shows a cross-section according to the line II-II of fig. 1 across one single panel; and

fig. 3 shows a side view of the panel of figs. 1 and 2.

[0026] The drawing shows a panel 1 consisting of the longitudinal walls 2 and the transverse walls 3 and 4. The transverse wall 3 is provided with a C-shaped portion 5 in which a protruding portion 6 connected to said transverse wall 4 can be fittingly received. Owing to this, said elements can not be pulled apart.

[0027] The transverse walls 3 and 4 are not square to the longitudinal walls 2, but can enclose an angle α with a plane 7 being square to the longitudinal walls. Due to this, the transverse walls will enclose an angle twice as large. The angle α will preferably be about 5° , but can of course also have another value, depending on the application of the panels 1.

[0028] The longitudinal walls 2 are additionally supported in relation to each other by one or more intermediate transverse walls 8. At least one of the longitudinal walls 2 is provided with perforations 9. The dimensions of the openings concerned can be adapted to the purpose. Generally, however, one and the same perforation can be used for various purposes.

[0029] As shown in the figs. 1 and 2, a panel 1 can be slid onto a post 10 which is anchored to the ground 12 by means of a baseplate 11. A number of panels can then be mutually connected and the last panel of a series can be mounted on a post 10.

[0030] For supporting the series of panels, slots 13 have been provided in the transverse walls 3, 4 and 8, in which strips 14 can be received, which then almost contact the longitudinal walls 2. The series of panels 1 can then offer more resistance to the wind load or another load.

[0031] Within the panel, a dividing wall 16 being provided with a sound-absorbing material 17 such as mineral wool, for example, can be mounted in its cavity 15. This material will be situated at a longitudinal wall 2 provided with perforations 9. Naturally, the other longitudinal wall of a panel 1 can be provided with perforations

too and then the other side of the dividing wall 16 can be provided with a sound-absorbing material. In this case, the wall will be double-acting. In order to fix the dividing wall 16 in its place, slots 18 have been provided in the transverse walls 18.

[0032] When one of the posts 10 of a wall would slightly subside, the assembly of panels 1 situated there might be raised and be supported at this level so that the upper edges of all panels again form a straight line. Here, the strips 14 mounted in the panels play an important part.

[0033] It will be obvious, that only one possible embodiment of a sound-damping wall according to the invention has been illustrated in the drawing and described above and that many changes can be made without leaving the inventive idea, as it is indicated in the enclosed claims.

Claims

1. A sound-damping wall for arrangement alongside a railroad or highway, wherein the wall is composed of rectangular panels (1), each of which comprising longitudinal walls (2) and transverse walls (3,4), the panels having a rectangular cross-section, the one transverse wall (3) of a panel having a longitudinally extending receiving portion (5) and the other transverse wall (4) being provided with a protruding portion (6) which can be engaged in the receiving portion (5) of a subsequent panel (1), at least one longitudinal wall (2) of a panel (1) being provided with a perforation (9), **characterized in that** said receiving portion (5) is C-shaped and the protruding portion (6) being shaped such that it is matingly received in said C-shaped portion, subsequent transverse walls (3,4, 8) of a panel (1) being provided with a number of aligned openings (13) through which an elongated member (14) being square to said transverse walls can be slid.
2. Sound-damping wall according to claim 1, **characterized in that** the openings are in the shape of slots (13) being transversely to the longitudinal direction of the transverse walls (3,4,8) and substantially extending up to the longitudinal walls (2) of the panel (1), said elongated member being a strip (14) which is substantially lying against the inner side of the longitudinal walls (2).
3. Sound-damping wall according to claim 1 or 2, **characterized in that** the transverse walls (3,4) form an angle (α) between 2° and 10° to a plane (7) being square to the longitudinal walls (2) of the panel.
4. Sound-damping wall according to claim 3, **characterized in that** the angle (α) between a transverse wall (3, 4) and the plane (7) being square to the lon-

gitudinal walls (2) substantially is 5°.

Patentansprüche

1. Schallschutzmauer zur Anordnung entlang einer Eisenbahnstrecke oder Landstraße, welche Schallschutzmauer aus rechteckigen Paneelen (1) zusammengesetzt ist, die jeweils Längswände ((2) und Querwände (3,4) umfassen und einen rechteckigen Querschnitt besitzen, wobei die eine Querwand (3) eines Paneels einen sich längs erstreckenden Aufnahmebereich (5) besitzt und die andere Querwand (4) mit einem vorragenden Bereich (6) versehen ist, der mit dem Aufnahmebereich (5) eines sich anschließenden Paneels (1) verbunden werden kann, und wobei wenigstens eine Längswand (2) eines Paneels mit einer Perforation (9) versehen ist, **dadurch gekennzeichnet, dass** der Aufnahmebereich (5) C-förmig ist und dass der vorragende Bereich (6) so geformt ist, dass er kompatibel in dem C-förmigen Bereich aufgenommen wird, wobei nachfolgende Querwände (3,4,8) eines Paneels (1) mit einer Anzahl in Reihe liegender Öffnungen (13) versehen sind, durch die ein längliches Element (14), das im rechten Winkel dazu steht, einschiebbar ist.
2. Schallschutzmauer nach Anspruch 1, **dadurch gekennzeichnet, dass** die Öffnungen die Gestalt von Schlitz (13) haben, die quer zur Längsrichtung der Querwände (3,4,8) angeordnet sind und sich im wesentlichen bis hinauf zu den Längswänden (2) des Paneels (1) erstrecken, wobei das längliche Element als ein Streifen (14) gestaltet ist, der im wesentlichen gegen die Innenseite der Längswände (2) anliegt.
3. Schallschutzmauer nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Querwände (3,4) einen Winkel (α) zwischen 2° und 10° zu einer Ebene (7) bilden, die senkrecht zu den Längswänden (2) des Paneels steht.
4. Schallschutzmauer nach Anspruch 3, **dadurch gekennzeichnet, dass** der Winkel (α) zwischen einer Querwand (3,4) und der Ebene (7), die senkrecht zu den Längswänden (2) des Paneels steht, im wesentlichen 5° beträgt.

Revendications

1. Mur anti-bruit pour mise en place le long d'une voie de chemin de fer ou d'une autoroute, dans lequel le mur est composé de panneaux rectangulaires (1), dont chacun comprend des parois longitudinales (2) et des parois transversales (3,4), les panneaux

ayant une section transversale rectangulaire, l'une des parois transversales (3) d'un panneau ayant une portion de réception s'étendant longitudinalement (5) et l'autre paroi transversale (4) étant dotée d'une portion en saillie (6) qui peut être engagée dans la portion de réception (5) d'un panneau consécutif (1), au moins une paroi longitudinale (2) d'un panneau (1) étant munie d'une perforation (9), **caractérisé en ce que** ladite portion de réception (5) est en forme de C et la portion de saillie (6) est formée de telle sorte qu'elle peut s'encastrer dans ladite portion en C, des parois transversales consécutives (3,4,8) d'un panneau (1) étant munies d'un certain nombre d'ouvertures alignées (13) à travers lesquelles peut coulisser un élément allongé (14) perpendiculaire auxdites parois transversales.

2. Mur anti-bruit selon la revendication 1, **caractérisé en ce que** les ouvertures sont sous la forme de fentes (13) transversales à la direction longitudinale des parois transversales (3,4,8) et s'étendant sensiblement jusqu'aux parois longitudinales (2) du panneau (1), ledit élément allongé étant une bande (14) qui repose sensiblement en appui contre le côté intérieur des parois longitudinales (2).
3. Mur anti-bruit selon la revendication 1 ou 2, **caractérisé en ce que** les parois transversales (3,4) forment un angle (α) entre 2° et 10° par rapport à un plan (7) perpendiculaire aux parois longitudinales (2) du panneau.
4. Mur anti-bruit selon la revendication 3, **caractérisé en ce que** l'angle (α) entre une paroi transversale (3,4) et le plan (7) qui est perpendiculaire aux parois longitudinales (2) est sensiblement de 5°.

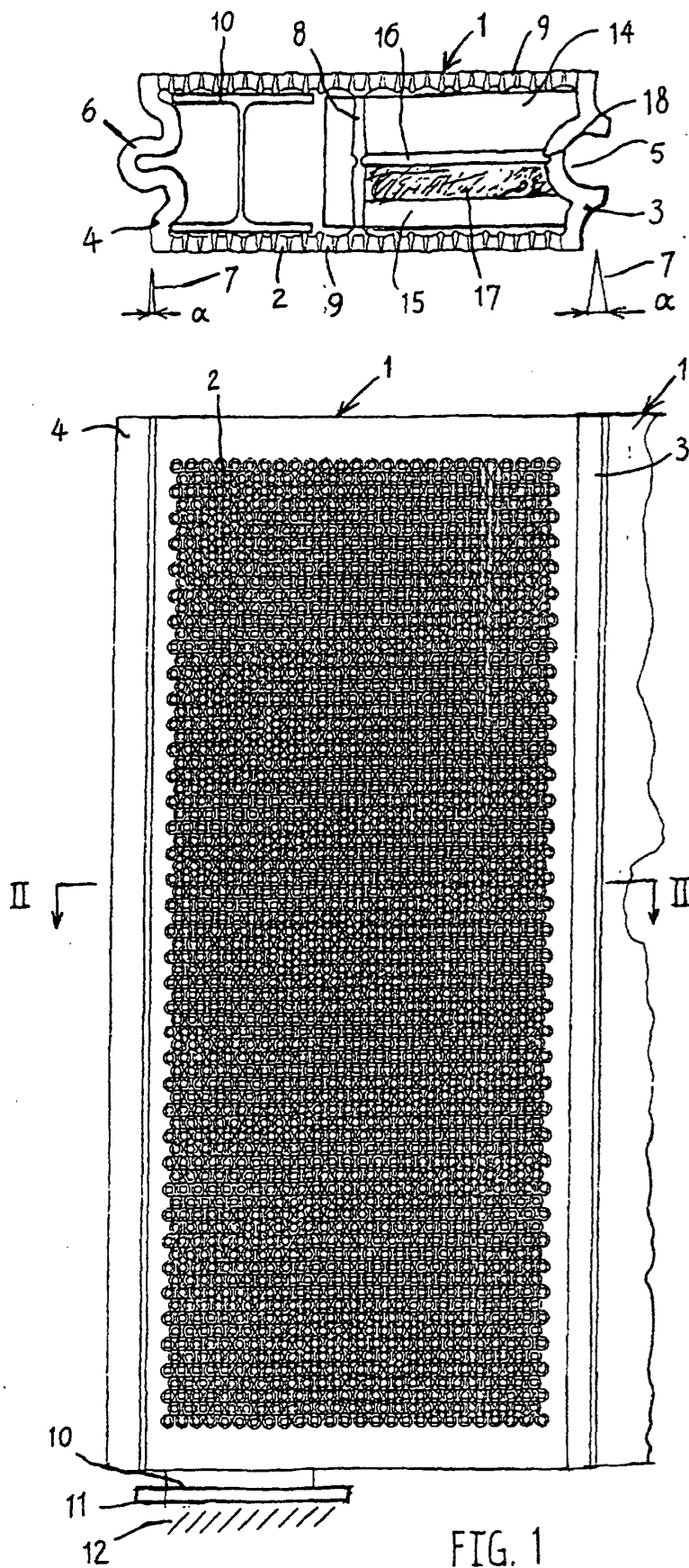


FIG. 2

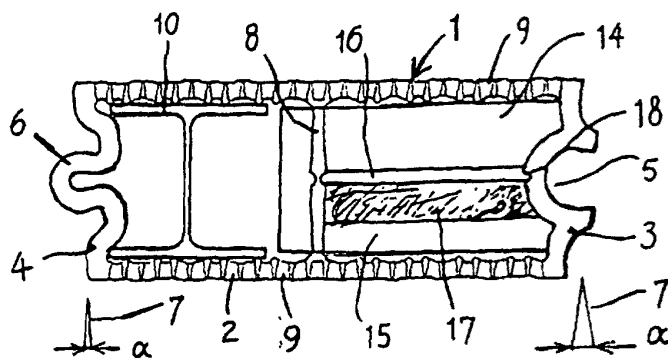


FIG. 3

