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(54) Sound-insulating concrete wall

(57) A concrete panel (605) according to the present invention is obtained by removing a concrete material into a form, pressing the concrete material to form a formed body having an uneven surface, and putting the formed body out of the form. The concrete material for the concrete panel comprises a cement, a fine aggregate, a dispersing agent, reinforcing fibers, and water. The amount of water included in the mixing concrete material is previously reduced by the dispersing agent. The fine aggregate comprises a component consisting of cinder or fly-ash, each of which have a high water permeability ratio and enables the formed body to be compacted so that the formed body can retain its shape even if the formed body is removed from the form quickly after the pressure step.

FIG.6

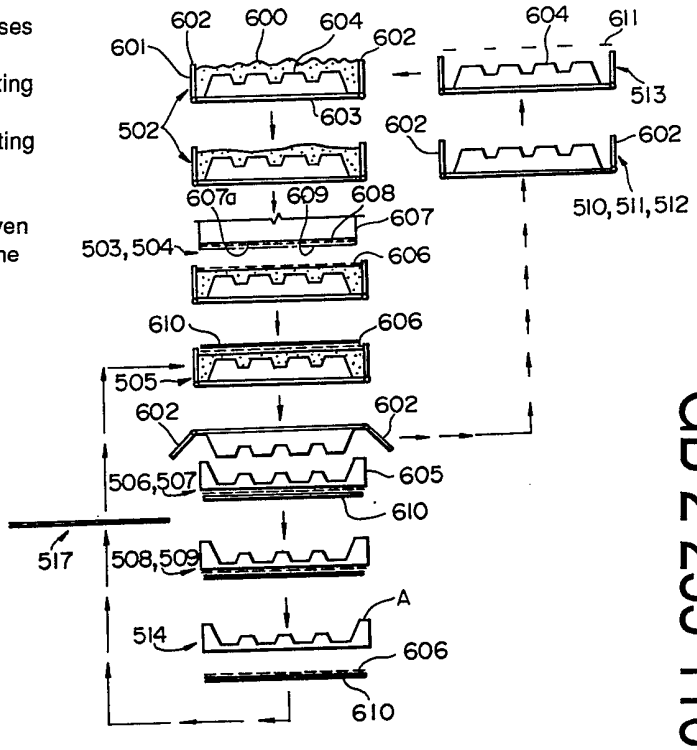

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FIG.1

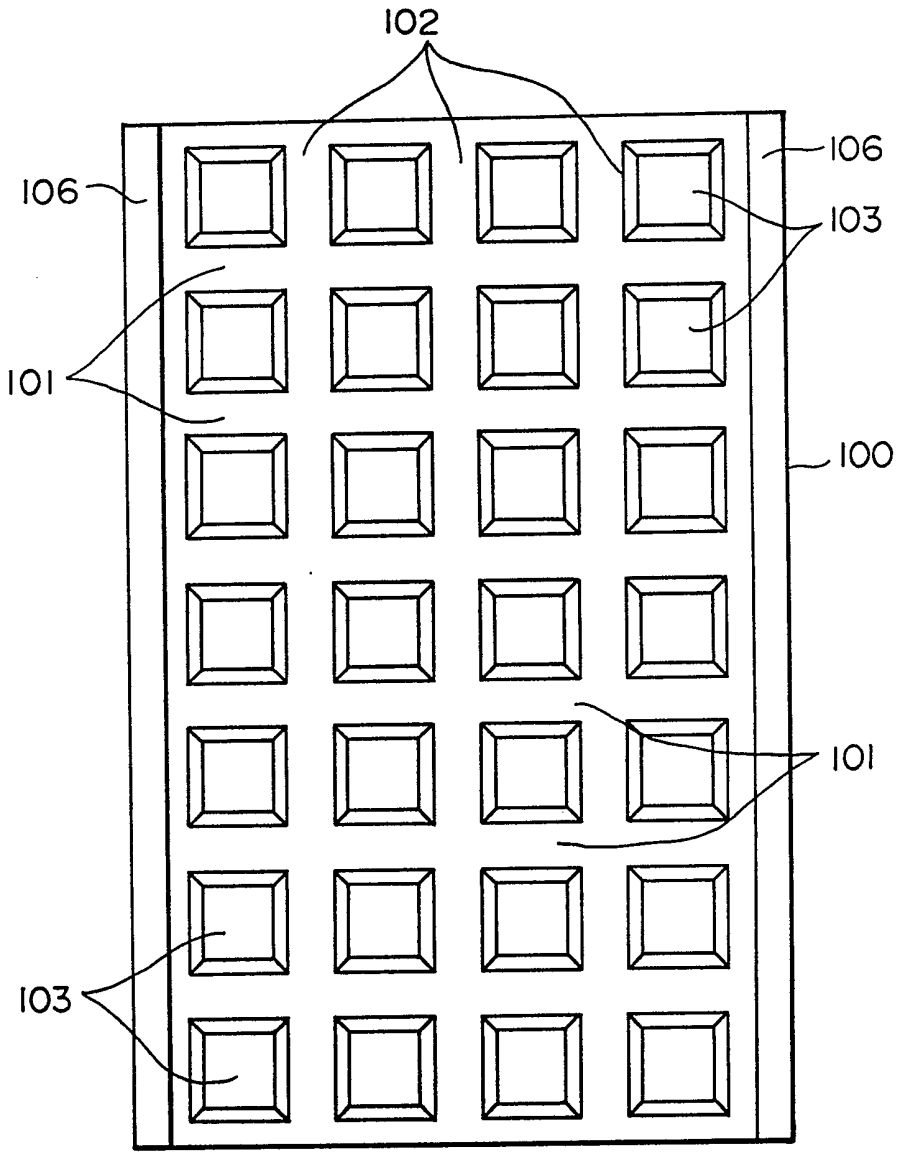


FIG.2

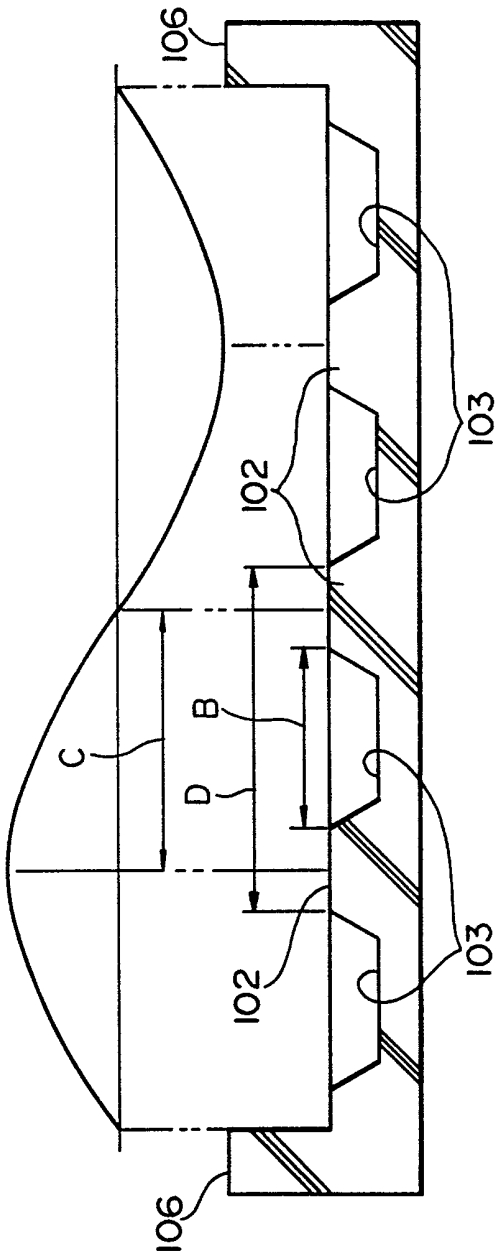


FIG.3

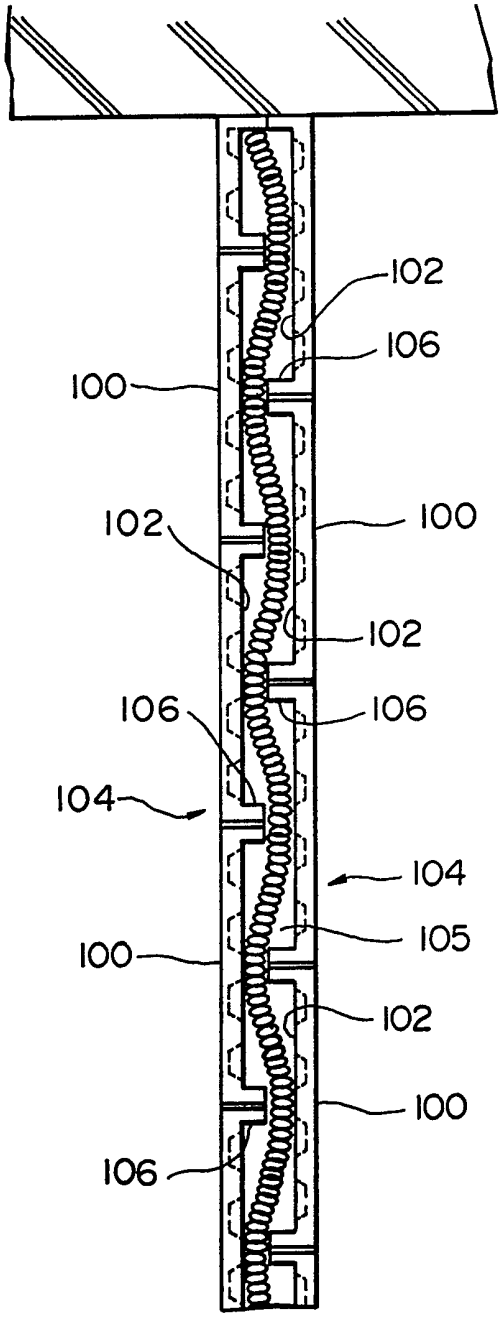


FIG.4

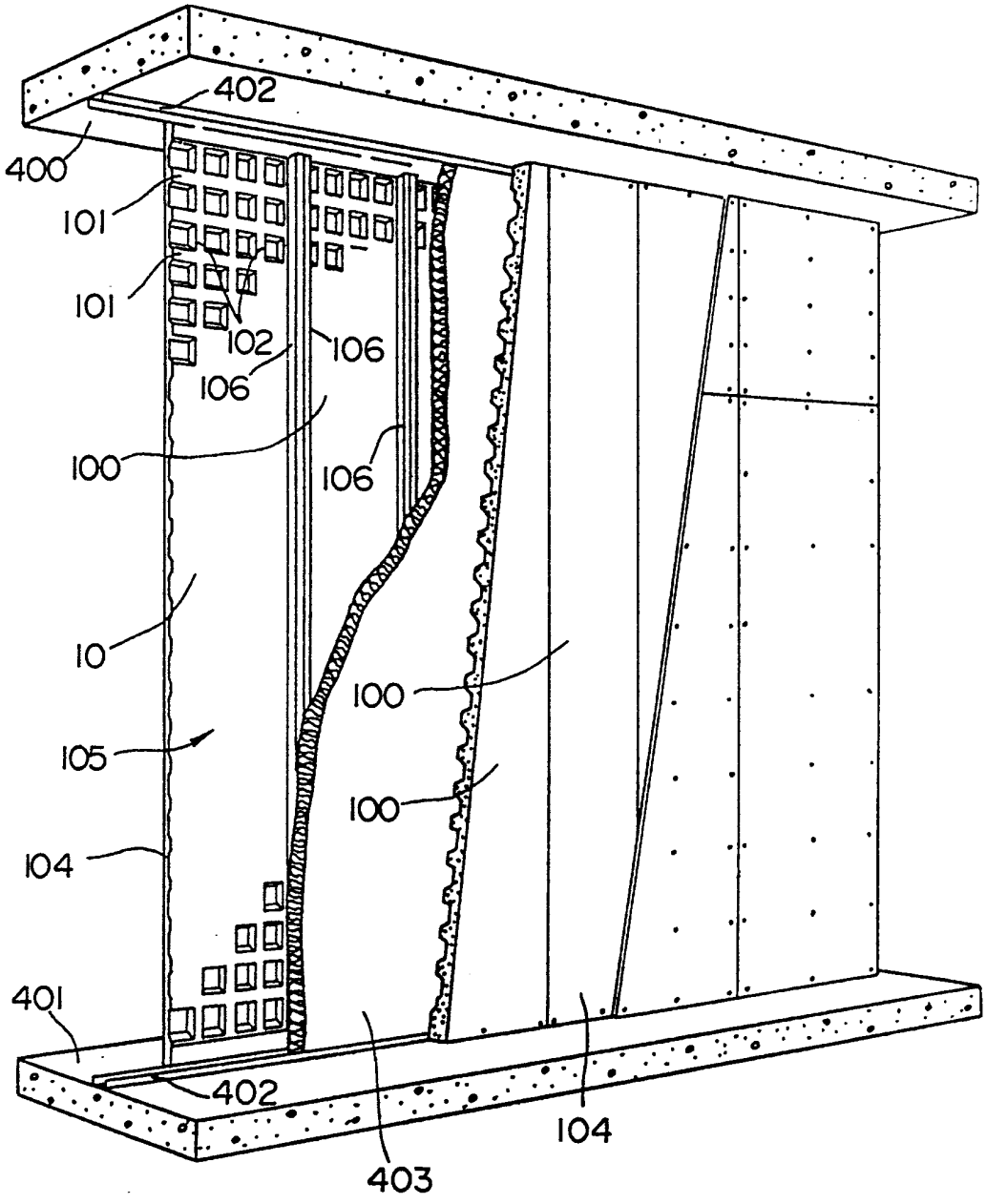

402
400
101
101
102
106
106
100
106
10
100
105
100
104
401
402
104
403

FIG.5

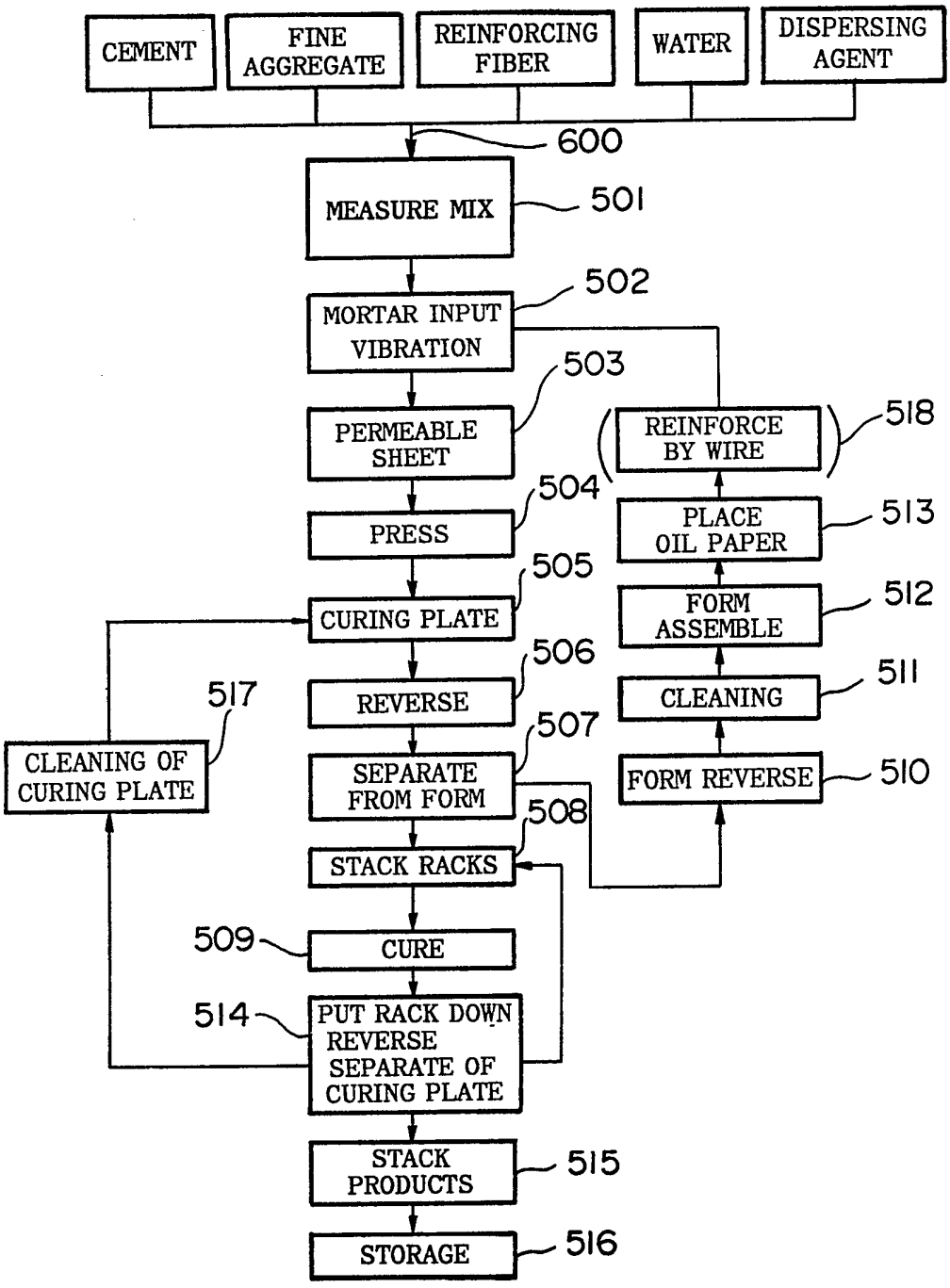
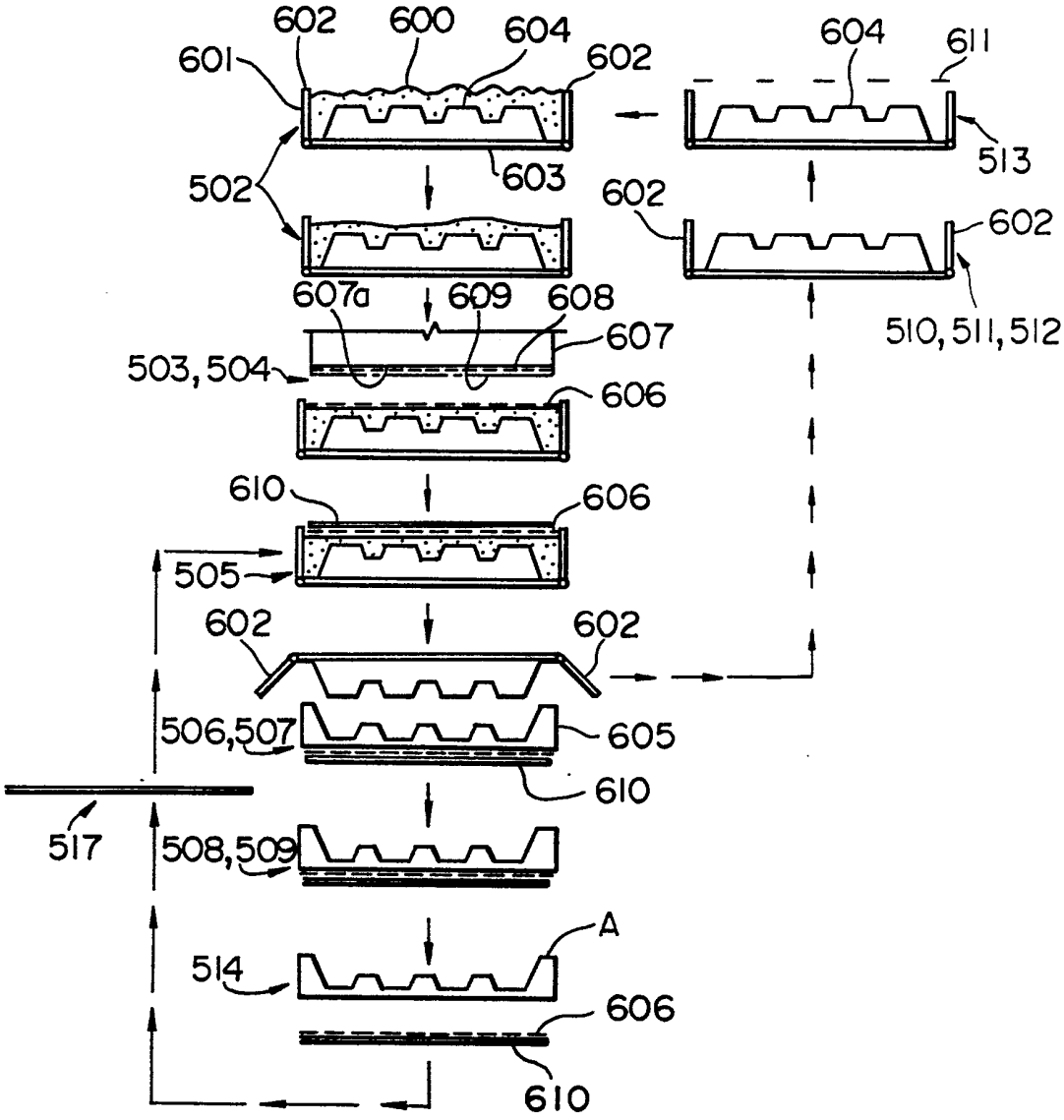

CEMENT
FINE AGGREGATE
REINFORCING FIBER
WATER
DISPERSING AGENT
600
MEASURE MIX
501
MORTAR INPUT VIBRATION
502
PERMEABLE SHEET
503
PRESS
504
CURING PLATE
505
REVERSE
506
SEPARATE FROM FORM
507
STACK RACKS
508
CURE
509
PUT RACK DOWN REVERSE SEPARATE OF CURING PLATE
514
STACK PRODUCTS
515
STORAGE
516
CLEANING OF CURING PLATE
517
REINFORCE BY WIRE
518
PLACE OIL PAPER
513
FORM ASSEMBLE
512
CLEANING
511
FORM REVERSE
510

FIG.6


602
600
604
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607a
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503,504
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505
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506,507
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508,509
A
514
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610
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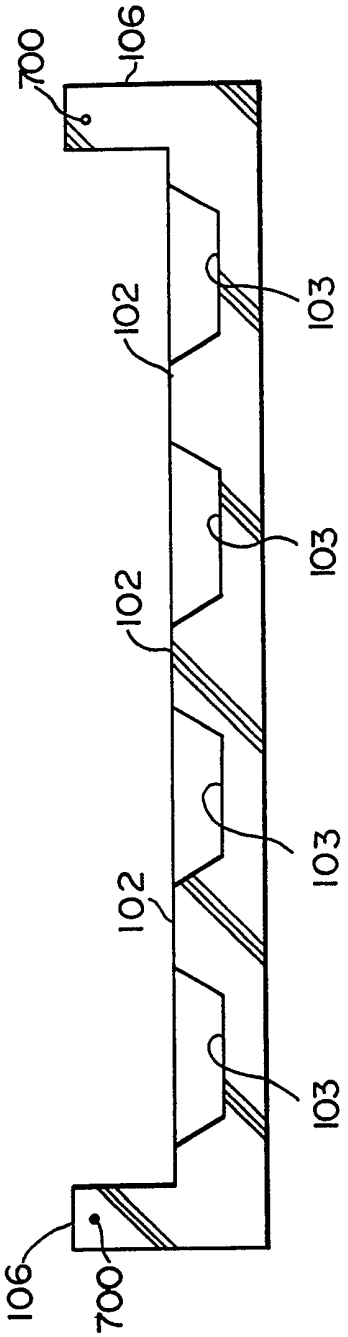
510,511,512

FIG.7



CONCRETE PANEL AND METHOD OF MANUFACTURE THEREFOR

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a concrete panel used as a partition wall in a construction made of concrete, an external wall of building, or an ordinary fence or wall. In particular, the present invention relates to a concrete panel which is effective for use as a sound insulation wall. Furthermore, the present invention relates to a method of manufacturing a concrete panel, which is effective to manufacture a concrete panel having a thin, uneven and complicated shape.

Related Art

Generally, a cast-in-place concrete wall, or a sound insulation wall comprising two sets of comparatively thin concrete panels provided with a hollowness of some width therebetween, is known for a wall body for a construction made of concrete.

When the thickness of the wall body is increased so as to increase the transmission loss (TL) thereof, a trough portion, which has a TL value less than the theoretical value shown in the massive side, may occur. It is believed that the occurrence of the trough portion is caused by a

resonance phenomenon in which the wavelength of a sound obliquely incident upon the wall surface is coincident with the wavelength of a bending vibration of the plate caused by the sound. Such a phenomenon is called the coincidence effect.

The applicant has proposed a sound insulation concrete panel and a sound insulation wall, as described in Japanese Application No. (Tokugan-Hei) 1-50356 for the purpose of providing a concrete panel which can lower such a coincidence effect in principle and has a light weight and a high strength.

The concrete panel 100 is reinforced by a plurality of reinforcing ribs 101 ..., as shown in FIGS. 1 and 2. A plurality of parallel vibration suppressing ribs 102 ... are formed on one surface of the concrete panel 100 and are spaced apart from each other at a predetermined distance. A plurality of reinforcing ribs 101 ... are formed on the surface of the panel 100 so that each of the reinforcing ribs 101 ... is laid across each of the thin portions 103 provided between the parallel vibration suppressing ribs 102. As shown in FIG. 2, each of the shortest distances B between the top portions of the adjacent reinforcing ribs 101 ... is set to value less than the 1/4 wavelength C of the wavelength corresponding to the critical frequency of the coincidence effect. Each of the longest distances D between the edges of the top portions of the adjacent ribs 101 ... is set to have a value larger than the 1/4 wavelength of the wavelength corresponding to the critical frequency of the coincidence effect. The 1/4 wavelength of

the wavelength corresponding to the critical frequency of the coincidence effect may be replaced by 1/8 or 1/12 wavelength thereof.

Furthermore, the sound insulation wall comprises two sets of wall bodies 104 and 104 each of which is constructed by connecting a plurality of the concrete panels A, as shown in FIG. 3. The wall bodies 104 and 104 are provided in parallel apart from each other at a predetermined distance, including a gap portion 105 therebetween. The sound insulation wall is characterized in that a plurality of connecting ribs 106 ..., which project in the same direction as that of the vibration suppressing ribs 102 ..., are provided on both end portions of each concrete panel 100, and concrete panels A are connected to adjacent panels by connections of connecting ribs 106 and 106 on both end portions thereof, when the connection ribs are directed to the gap portion 105.

In such a construction, when a sound wave in the coincidence range is incident upon the concrete panel 100, both the crest and the node of the bending wave travelling inside the concrete panel 100 are simultaneously suppressed by each of the vibration suppressing ribs 102 .... Consequently, a lowering of the transmission loss due to the coincidence effect is suppressed to improve the second insulation efficiency.

The sound insulation concrete panel has a width of 450 mm and a standard length of 2,700 mm. The concrete panel has the thinnest portions with a thickness of 15 mm, and has ribs in a lattice shape with a height of 25 mm and a

width of 30 mm to 50 mm. Generally, such a concrete panel with a thin, long, uneven and complicated shape has been made by a pouring and steam-curing method, so that the manufacturing method thereof is time-consuming.

A form used for formation of a concrete panel or the like is relatively expensive. In particular, manufacturing the concrete panel is time-consuming, since the panel has a complicated shape.

The pouring and steam-curing method requires a form for manufacturing a concrete panel over a long curing period. Therefore, the method has a problem of requiring many forms and high facility costs so as to manufacture many concrete panels in a short time to increase production efficiency.

SUMMARY OF THE INVENTION

In view of the above circumstances, the applicants have invented a method of manufacturing a concrete panel comprising the steps of putting a concrete material into a form, pressing the concrete material to make a formed body, putting the formed body out of the form by reversing the form, pushing the formed body out of the form quickly after pressing, and returning the form to the step of putting concrete material into the form; this is done instead of the conventional pouring and steam-curing method. Accordingly, it is possible to manufacture the concrete panel in short time, and to reduce the number of forms necessary.

However, in order to reduce the necessary number of forms by the above-mentioned method, it is necessary to prepare a concrete material which is easily compressed in the form compactly through a pressure forming and which becomes hard so that the formed body hardly gets out of shape by pressing in a short time.

The present invention was developed in view of the above circumstances.

An object of the present invention is to provide a concrete panel which can be manufactured by being removed the form quickly after pressing for a short time.

Another object of the present invention is to provide a method of manufacturing a concrete panel which enables manufacturing in a short time without many forms, so that the concrete panels may be manufactured continuously.

In order to achieve the above object of the present invention, there is provided a concrete panel obtained by putting a concrete material into a form, pressing the concrete material to form a formed body having an uneven surface, and putting the formed body out of the form, wherein the concrete material comprises a cement, a fine aggregate, a dispersing agent, reinforcing fibers, and water; and the fine aggregate comprises a component selected from the group consisting of cinder and fly-ash.

Since a dispersing agent is included in the concrete material, it is possible to reduce the amount of water for mixing concrete material. The fine aggregate comprises a component selected the group consisting of cinder and fly-ash which enables the formed body to be tightened compactly

in the form and to have a high water absorption ratio. Therefore, it is possible to compact the mixed concrete material in the form in a short time.

Furthermore, the concrete panel is characterized in that the concrete material has a rectangular plate shape and connecting ribs, which project to one side, provided on both ends of the concrete panel, the concrete panel being a component of a wall which comprises a plurality of the concrete panels connected to each other through the connecting ribs, in which a reinforcing steel wire is embedded inside each of the connecting ribs in the longitudinal direction thereof.

In this way, a wall body can be constructed by arranging concrete panels made of the above-mentioned concrete material. When connecting ribs for connecting adjacent concrete panels to each other are provided on the concrete panel, embedding reinforcing steel wires inside the connecting ribs can reinforce the concrete panel easily.

The concrete panel is characterized in that the concrete material is formed in a rectangular plate shape, a plurality of parallel vibration suppressing ribs are formed at predetermined intervals on the one side of the concrete panel, and a plurality of parallel reinforcing ribs are formed on the side so that each reinforcing ribs is laid across each of the thin portions between the parallel vibration suppressing ribs.

In this way, forming a vibration suppressing rib and a reinforcing rib on a surface of the concrete panel, which

is made of the above-mentioned concrete material, enables easily forming a panel with a high sound insulation characteristic by similar steps to that of the aforementioned concrete panel.

The method of manufacturing a concrete panel comprises the steps of, putting a mixed and kneaded concrete material into a form, pressing the concrete material using a pressing plate through an upper opening of the form to make a formed body, removing the formed body from the form by reversing the form, and curing the formed body; wherein the concrete material includes a dispersing agent; a water permeable portion is provided at a pressing surface of the pressing plate to allow water to drain out from the form, which was produced by dehydration from the formed body, the step of putting the formed body out of the form is carried out soon after the step of pressing; and the step of curing the formed body is carried out after the step of putting the formed body out of the form.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view showing the shape of a concrete panel.

FIG. 2 is a sectional view showing a horizontal section of the above-mentioned concrete panel.

FIG. 3 is a sectional view showing a sound insulation wall formed by using the above-mentioned concrete panel.

FIG. 4 is a perspective and fragmentary sectional view showing the sound insulation wall.

FIG. 5 is a flow chart showing the steps of manufacturing the concrete panel.

FIG. 6 is a schematic view showing the steps of manufacturing the concrete panel.

FIG. 7 is a sectional view showing the concrete panel having reinforcing steel wires embedded inside connecting ribs.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment of the present invention will be explained according to FIGS. 4-7.

FIGS. 4-7 show a method of manufacturing a sound insulation wall comprising the concrete panels A, or of manufacturing the concrete panel 100. The concrete panel 100 according to the present embodiment is similar to the aforementioned concrete panel 100. Therefore, like reference numerals designate like elements having similar function and the explanations thereof will not be repeated hereunder.

The sound insulation wall is constructed by plural connected concrete panels A, each of which has a rectangular shape, as shown in FIG. 4. On both end portions of the concrete panel 100, connecting ribs 106, which project to one side, are formed. A plurality of parallel vibration suppressing ribs 102 extending to the upper and lower direction and a plurality of parallel reinforcing ribs 101 extending to the right and left directions are provided at predetermined intervals

respectively on the one side of the concrete panel 100. These ribs 101 and 102 cross at right angles to form a lattice.

In the concrete panel 100, the vibration suppressing ribs 102 ... are provided at intervals similar to that defined in the aforementioned prior art. The reinforcing ribs 101 and 101 are provided at intervals similar to that of the vibration suppressing ribs 102 and 102.

Two walls 104 and 104, each of which comprises a plurality of connected concrete panels 100, are provided in parallel at a predetermined interval. The upper and lower ends of each concrete panel 100 are attached to steel liners 402 which are provided on the surface of a ceiling 400 and on the surface of a floor 401 respectively. A heat insulating fiber member 403 is provided in a gap portion 105 between the two walls 104 and 104. The end portions in right and left directions of the adjacent concrete panels 100 are connected by the connecting ribs 106. The ribs 106 on one wall 104 are arranged alternately with the ribs 106 on the other wall 104 facing the one wall 104. Each of these ribs 106 is projected to the gap portion 105.

The concrete material for forming such a concrete panel comprises a cement, a fine aggregate, a dispersing agent, reinforcing fibers, and water, as shown in FIG. 5.

The cement may be a normal Portland cement, a high-early-strength Portland cement, or an A-type of Portland blast furnace cement. In this embodiment, a normal Portland cement was used.

A granulated cinder sand with a diameter of 0.15 mm to 2.5 mm was used as the fine aggregate.

A high efficiency dispersing agent (e.g., MIGHTY 150 made by Kao Corporation) having a dispersing ratio higher than that of an ordinary dispersing agent was used as the dispersing agent.

Synthetic resin fibers such as vinylon fibers, polypropylene fibers, glass fibers, ceramic fibers or the like can be used as the reinforcing fibers. In the embodiment, vinylon fibers (by Kuraray Co., Ltd.) having a length of 8 mm to 16 mm and a thickness of 300 denier to 400 denier were used.

An admixture for expediting the removal of a formed body out of a form immediately (e.g., BLOCASTER-F made by Kao Corporation) may be added.

The concrete material comprises 100 weight parts of cement, 80-150 weight parts of cinder sand, 0.5-2.0 weight parts of high efficiency dispersing agent, 30-33 weight parts of water, and 1.7-5.1 weight parts of vinylon fibers. In the embodiment, a mixed concrete material was used. The concrete material comprises 251 kg/m^3 of water, 761 kg/m^3 of cement, 913 kg/m^3 of cinder sand, 19.5 kg/m^3 of vinylon fibers, and 4.6 kg/m^3 of high efficiency dispersing agent.

The high efficiency dispersing agent is used for decreasing the mix proportion of water in the concrete material 600 so that the formed body can be removed the form quickly after the pressing step to reduce the pressing time. Accordingly, the necessary minimum amount of water can be added to the concrete material when the material is

mixed and kneaded. The amount of water from the dehydration of the concrete material is reduced so that the formed body retains its shape when the formed body is removed from the form quickly after the pressing step. Therefore, it is possible to reduce the pressing time.

If the mix proportion of the high efficiency dispersing agent is much more than 2.0 weight parts to a 100 weight parts of cement, the components may separate from each other, Less than 0.5 weight parts of dispersing agent is insufficient to be effective. To keep the mix proportion of water between 30 to 33 weight parts to 100 weight parts of cement can decrease the pressing time.

The vinylon fibers are added as reinforcing members for increasing the strength of the concrete panel. Addition of vinylon fibers of more than 5.1 weight parts is ineffective in producing a greater effect, and the addition of less than 1.7 weight parts is ineffective in increasing the strength of the concrete panel.

Since cinders or the like which are fine aggregates have a high ratio of water absorption, it has not generally been often used as an aggregate for mortar or cement generally. However, it is necessary to remove the formed body out of the form quickly after pressure forming and to use the form for another forming as soon as possible. In the present invention, the cinder sand having a high ratio of water absorption is effective to compact the concrete material to the form and to decrease the amount of excessive water in the cement of the formed body after the pressure step. Addition of the cinder sand of more than

150 weight parts or less than 80 weight parts to 100 weight parts of cement, is not satisfactory.

A method of manufacturing a concrete panel using such a concrete material will be explained as follows.

As shown in FIGS. 5 and 6 schematically, cement, cinder sand, vinylon fibers, water, and a high efficiency dispersing agent, which are components of the concrete material 600, are respectively measured, and are mixed and kneaded together by a mixer (step 501).

Next, the mixed concrete material 600 is put into a form 601. The form 601 has a bottom with an uneven surface corresponding to the shape of the concrete panel 100, and side walls 602 which are provided at the side edges of a bottom plate 603 so that the side walls can be rotated toward the outside extending around the side edges. The upper side of the form is open. The bottom surface 604 of the form 601 is lined with an oil-paper so as to be able to separate the formed body 605 from the form 601 easily and to prevent the form 601 from being soiled.

Then, the form 601 including the concrete material 600 is vibrated to fill up and compact the concrete material 600 in the form 601 and the upper surface thereof is made even (step 502).

A water permeable sheet 606 is placed on the upper surface of the filled concrete material 600 so as to dehydrate smoothly through the pressed surface when the concrete material is pressed through the upper opening of the form 601 (step 503).

Then, the concrete material 600 in the form 601 is pressed from the upper direction by a pressing plate 607. A metal net 608 is stuck on the pressure surface 607a of the pressure plate 607. Furthermore, a punching metal plate 609, which is a flat metal plate having numerous through-holes, is stuck on the under surface of the metal net 608. When the concrete material 600 is pressed, water passing through the permeable sheet 606 from the dehydrated concrete material 600 can drain therethrough. By such a construction, dehydration during pressing can be accelerated. Consequently, it is possible to decrease the processing time.

Next, pressing is released. Thereafter, a curing plate 610 is placed on the permeable sheet 606 placed on the formed body 605 (step 505).

The form 601 is reversed so that the curing plate 610 faces downward (step 506). The side plates 602 and 602 forming the side walls of the form 601 are opened outwardly and the formed body 605 is removed from the form so that the curing plate 610 is on the lower side (step 507).

The removed formed body 605 is loaded on a rack (step 510) to be cured (step 511) in the state of being placed on the curing plate 610. The form 601 from which the formed body was removed is reversed again (step 512). The oil-paper 611 lining the inner surface of the form 601 is removed and the form 601 is cleaned (step 513). After the cleaning, the side plates 602 and 602 are closed to construct the form (step 508). The bottom surface 604 of the form 601 is lined with a new oil-paper 611. After a

new oil-paper is put in the form, the form is returned to the step of putting concrete material into a form again (step 509).

The cured formed body 605 is removed from the rack and is reversed. The curing plate 610 and the permeable sheet 606 are separated (step 514). In such a way, a concrete panel 100 is completed. Thereafter, the resulting concrete panels 100 are piled (step 515) and stored (step 516).

The curing plate 610 separated from the formed body 605 is cleaned to be sent to the step again in which the curing plate 610 after the pressing step is placed on the formed body 605 (step 517).

The concrete panel 100 can be manufactured by repeating the above steps. It is unnecessary to prepare many forms 601, since the pressing step requires only several minutes by using the above concrete material 600. It is possible to manufacture the concrete panel 100 by sending the form, from which the formed body 605 was removed, back to the pressing step.

The transfer of the form 601, the curing plate 610, and the formed body 605 to each step is carried out by a conveyor.

The concrete panel 100 according to the present embodiment uses the above concrete material 600, in particular, cinder sand may be used as a fine aggregate. Therefore, it is possible to compact the concrete material in the form when the concrete panel is being manufactured by applying pressure, even if the pressure-application time is short. Since the cinder sand has a high ratio of water

absorption, it is possible to decrease the amount of excessive water in the mixed concrete material, so that the formed body retains its shape even if the formed body is removed the form quickly after the pressure step. It is possible to form a formed body by applying only slight pressure because the cinder sand can absorb excessive water in the formed body so that a large applied pressure is not required for dehydration of the formed body.

The dispersing agent was previously added to the concrete material 600 to decrease the amount of water. Therefore, the dispersing agent enables reduction of the pressing time in combination with the effect of the cinder sand.

Therefore, it is possible to manufacture the concrete panel 100 in a short time. In the method of the present invention, a form 601 is being used in the step of a pressing step for a short time, the previous and subsequent steps of putting the concrete material 600 into the form and the step of cleaning the form 601; after these steps, the form 601 can be used for manufacturing another concrete panel 100 by being sent to the prior step; and therefore, it is possible to manufacture concrete panels A continuously without using numerous expensive forms 601, and the manufacturing costs of the concrete panel are thereby reduced.

A concrete panel P as shown in FIG. 7 has a shape similar to that of the concrete panel 100. The concrete panel P has reinforcing steel wires 700 embedded inside

connecting ribs 106 in the longitudinal direction of the connecting ribs 106.

Such a reinforced concrete panel P is manufactured by the following process.

In the above manufacturing process, before the concrete material 600 is put into the form 601, there is provided a step of arranging (step 518) bundles of steel wires 700 in grooves for forming the connecting ribs 106 on both end portions of the form 601, as shown in the flow-chart in FIG. 5. Consequently, it is possible to manufacture the concrete panel P having embedded wires as reinforcing steel wires 700 inside the connecting ribs 106, as shown in FIG. 7. Therefore, it is possible to increase the strength of the concrete panel 100 easily and at low cost.

In the concrete panel 100, cinder sand was used as a fine aggregate. However, ordinary sand may be used as a fine aggregate in order to remove the formed body from the form quickly after pressure applied. In this case, it is difficult to compact the formed body and ordinary sand has a low absorption ratio in comparison with cinder sand. Since ordinary sand requires a long time and a large applied pressure forming, it is preferable to use the cinder sand. It is possible to use a granulated fly-ash with a 0.15 mm to 5.0 mm average granule diameter instead of the cinder sand so as to obtain effects similar to that of using the cinder sand.

In the above embodiment, the method of manufacturing the concrete panel 100 was described. However, various

types of concrete panels other than the concrete panel 100 can be manufactured by the method of the present invention.

In the method of manufacturing a concrete panel according to the present invention, a form 601 is occupied for manufacturing a concrete panel 100 only during the pressing step, the previous and subsequent steps of putting the concrete material 600 into the form, and the step of cleaning the form 601. After these steps, the form 601 can be used for manufacturing another concrete panel 100 by being returned to the previous step. Therefore, it is possible to manufacture concrete panels A continuously without using numerous expensive forms 601, and to reduce the manufacturing cost of the concrete panel.

The amount of water is reduced by adding a dispersing agent to the concrete material 600. Furthermore, the water permeable sheet 606 is placed on the concrete material 600. The metal net 608 and the punching metal 609 are attached on the pressure surface of the pressure plate 607. Therefore, the amount of water in the concrete material 600 is previously reduced. The dehydration of the formed body during the pressing step is carried out smoothly. Consequently, it is possible to reduce the time for pressing and to manufacture the concrete panel in a short time.

According to the method of the present invention, a small number of forms are used in rotation, so that a large area for manufacture is not required. The formed body 605 is removed from the form and is loaded on a rack so that the formed body is placed on the curing plate 610 and is

cured. Therefore, it is possible to reduce the area for curing. Furthermore, the cured concrete panels are piled and stored after being removed from the curing plate, so that the piled concrete panels does not require a wide area for storage.

The area occupied by the whole manufacturing equipment for the concrete panel may be small in comparison with that of a conventional one. Therefore, it is possible to reduce the cost for equipment or the like.

The formed body 605 can be easily removed the form 601 by reversing the form, so that the manufacture of the concrete panel does not require a long time.

As described above, the concrete panel according to the present invention provides the following excellent effects.

First, since the concrete panel according to the present invention uses the above concrete material, in particular, cinder or fly-ash as a fine aggregate, it is possible to compact the concrete material in the form, when the concrete panel is manufactured by applying pressure, even if the pressure applying time is short. Since the cinder sand and the fly-ash have a high ratio of water absorption, it is possible to have the excessive water in the mixed concrete material absorbed into the cinder sand or the like, so that the formed body can retain its shape to cure even if the formed body is removed from the form quickly after a short pressure step.

Second, it is possible to form a formed body by applying a small amount of pressure, because the cinder

sand can absorb excessive water in the formed body not to require a large applied pressure for dehydration of the formed body. Therefore, it is possible to manufacture the concrete panel in a short time.

Third, the cinder sand or the like is used as a fine aggregate and a dispersing agent is added to the concrete material; it is therefore possible to decrease the amount of water in the mixed concrete material compared to prior practice. Therefore, it is possible to reduce the pressing time due to the combined the effect of the cinder sand.

Fourth, the form is occupied by the pressing step for only a short time. After the pressing step, the form can be used for manufacturing another concrete panel by being sent to the prior step. Therefore, it is possible to manufacture concrete panels continuously without using numerous expensive forms and to reduce the manufacturing cost of the concrete panel.

A wall body can be constructed by arranging the above concrete panels. When connecting ribs for connecting adjacent concrete panels to each other are provided on the concrete panel, embedding reinforcing steel wires inside the connecting ribs can reinforce the concrete panel easily.

What is claimed is:

1. A concrete panel obtained by putting a concrete material into a form, pressing the concrete material to form a formed body having an uneven surface, and removing the formed body from the form,

wherein the concrete material comprises a cement, a fine aggregate, a dispersing agent, reinforcing fibers, and water; and wherein the fine aggregate comprises a component selected from the group consisting of cinder and fly-ash.

2. A concrete panel as claimed in claim 1; wherein the concrete material has a rectangular plate shape and has connecting ribs which project to the one side provided on both ends of the concrete panel, the concrete panel being a component of a wall which comprises a plurality of the concrete panels connected to each other through the connecting ribs; and wherein a reinforcing steel wire is embedded inside each of the connecting ribs in the longitudinal direction thereof.

3. A concrete panel as claimed in claim 1; wherein the concrete material has a rectangular plate shape, a plurality of parallel vibration suppressing ribs are formed at predetermined intervals on the one side of the concrete panel, and a plurality of parallel reinforcing ribs are formed on the side so that each reinforcing rib is laid across each thin portion between the parallel vibration suppressing ribs.

4. A concrete panel as claimed in claim 2; wherein the concrete material has a rectangular plate shape, a plurality of parallel vibration suppressing ribs are formed at predetermined intervals on the one side of the concrete panel, and a plurality of parallel reinforcing ribs are formed on the side so that each reinforcing rib is laid across each thin portion between the parallel vibration suppressing ribs.

5. A method of manufacturing a concrete panel comprising the steps of: putting a mixed and kneaded concrete material into a form, pressing the concrete material using a pressing plate through an upper opening of the form to make a formed body, putting the formed body out of the form by reversing the form, and curing the put out formed body;

wherein the concrete material includes a dispersing agent; a water permeable portion is provided at a pressing surface of the pressing plate for taking water, which was obtained by dehydration from the formed body, outside the form; the step of putting the formed body out of the form is carried out soon after the step of pressing; and the step of curing the formed body is carried out after the step of putting the formed body out of the form.

6. A method of manufacturing a concrete panel as claimed in claim 5; wherein the concrete material comprises a cement, a fine aggregate, a dispersing agent, reinforcing fibers, and water; and the fine aggregate comprises a

component selected from the group consisting of a cinder and fly-ash.

7. A wall body structure having a sound insulation function comprising: two walls provided in parallel to face each other with a predetermined gap, each of said two walls comprising a plurality of concrete panels and a means for connecting said concrete panels, each of said concrete panels having a rectangular plate shape, a plurality of parallel vibration suppressing ribs formed at predetermined intervals on the inner side of the concrete panel, and a plurality of parallel reinforcing ribs formed on the side so that each reinforcing ribs is laid across each of thin portions between the parallel vibration suppressing ribs.

8. A wall body structure as claimed in claim 7; wherein the structure further comprising a heat insulating fiber means provided in said gap between the two walls.

9. A concrete panel substantially as hereinbefore particularly described with reference to the accompanying drawings.

10. A method of manufacturing a concrete panel substantially as hereinbefore particularly described with reference to the accompanying drawings.

11. A wall body structure substantially as hereinbefore particularly described with reference to the accompany drawings.

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Relevant Technical fields

(i) UK Cl (Edition K) E1D (DCF, DF116, DLCQW, DLCQV, DLCRA, DLEQWNV, DLEQV, DLERA) C1H (HCA, HCD, HCP)

(ii) Int Cl (Edition 5) E04B, E04C, C04B

Search Examiner

D J LOVELL

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

29 JUNE 1992

Documents considered relevant following a search in respect of claims 1 TO 4

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
A	WO 82/02195 (GRACE)	1, 5
A	US 4261754 (KRENCHEL)	1, 5

Category	Identity of document and relevant passages	Relevant to claim(s)

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