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(54) Prefabricated structural panel for constructing civil or industrial use buildings

(57) The present invention relates to a prefabricated structural panel for constructing civil or industrial use buildings.

The panel comprises an armature which is constituted by two facing metal nets, which are spaced from one another and coupled by V-shape cross members, the two end portions of each cross member being welded to the wires of one of the nets and the apex thereof being welded to the wires of the other net.

Between the two nets a thermo-insulating or sound-insulating layer being arranged.

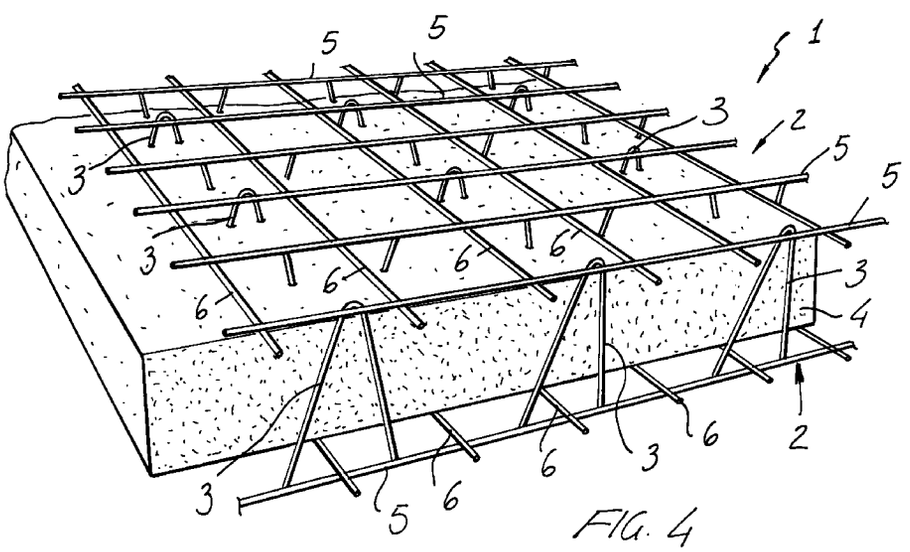

FIG. 4

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Description

BACKGROUND OF THE INVENTION

The present invention relates to a prefabricated structural panel for constructing civil or industrial use buildings.

Structural panels are already known which are substantially constituted by a metal material armature including a thermally-insulating and/or sound insulating material plate provided for being coated by one or more plaster layers.

Thus, the mentioned panels have a small weight, are provided with good insulating properties and they can be easily used for quickly constructing civil and industrial use buildings.

These structural panels, moreover, can be used as load bearing walls for small height buildings and they can be also used as buffering elements for constructing walls of comparatively high buildings, which include a reinforced concrete load bearing structure.

The above mentioned structural panels, owing to their small weight and handling characteristics, can be assembled in a very quick and easy manner and can be manually handled.

Before performing the plastering coating operation thereof, in the thermally insulating and/or sound insulating material plate can be embedded the main part of the electric and hydraulic ducts, thereby allowing the buildings being constructed to be quickly, economically and rationally finished.

Prior structural panels are provided with a soft steel wire armature, welded by resistance methods, and which comprises two opposite parallel nets, which are rigidly coupled to one another by a plurality of cross-members.

In some types of structural panels, the mentioned cross-members simply comprise metal rod pieces extending perpendicularly to the two opposite nets.

This type of armature or reinforcing structure has the drawback that its mechanical strength is comparatively small.

Also known are structural panels comprising armature or reinforcement structures comprising two opposite nets, which are coupled to one another by rod elements arranged on alternately opposite slanted lines.

These types of panels, owing to their specifically designed armature or reinforcement structure, have a strength which is greater than that of the previously disclosed type but even these latter panels are not fully satisfactory.

In yet other types of prefabricated structural panels, the armature or reinforcement structure comprises two opposite nets which are connected to one another by rods which are successively arranged with a slanted relationship with opposite angles.

This type of panel has a good strength since the reinforcement structure thereof has characteristics like those of a grid-like construction.

Notwithstanding this satisfactory strength of the reinforcement construction, on the other hand, this type of panel is affected by great problems with respect to the making of the reinforcement structure or armature therefor.

Yet other types of structural panels include an armature constituted by a grid-like structure formed by a continuously bent yarn, preferably with a zig-zag arrangement, with the apex portions thereof alternately welded on the two nets.

This type of panel is satisfactory from a technical standpoint, since it has the typical stiffness of a grid-like construction.

Moreover, this latter panel has encountered only a small success because of the making difficulties thereof.

SUMMARY OF THE INVENTION

Accordingly, the aim of the present invention is to overcome the above mentioned problems, by providing a prefabricated unexpensive structural panels which is moreover provided with a very good structural stiffness or strength.

Within the scope of the above mentioned aim, a main object of the present invention is to provide such a structural panel which also has very good thermally insulating and/or sound insulating features.

Yet another object of the present invention is to provide such a structural panel which can be made by easily commercially available apparatus.

According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a prefabricated structural panel for making civil or industrial use buildings, characterized in that said panel comprises an armature including two facing metal nets, spaced from one another, and coupled to one another by V shape cross elements, the two end portions of each said cross member being welded to the wires of one of the two nets and the apex portion thereof being welded to the wires of the other net, at least a thermally insulating and/or sound insulating material layer being arranged between said two nets.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the prefabricated structural panel according to the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of said panel, which is illustrated, by way of an indicative, but not limitative, example, in the figures of the accompanying drawings, where:

Figure 1 illustrates a half of the armature of the structural panel according to the present invention, as seen by a top plan view;

Figure 2 is a side elevation view illustrating that same half portion of the armature shown in figure 1;

Figure 3 is a perspective view illustrating a portion of the half armature of the panel according to the present invention;

Figure 4 is a further perspective view illustrating a portion of the prefabricated structural panel according to the present invention; and

Figures 5 and 6 are respectively a side elevation view and a partially cross-sectioned view illustrating the prefabricated structural panel according to the present invention in two subsequent assembling steps thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the number references of the above mentioned figures, the prefabricated structural panel according to the present invention, which has been generally indicated by the reference number 1, comprises a metal wire armature, which includes two metal nets 2, arranged with a facing relationship and spaced from one another, said nets being coupled to one another by cross members 3 of V shape, the two end portions of each said cross members 3 being welded to the wires of one of the nets 2 and the apex portion being welded to the wires of the other net 2.

Between the two nets 2 a thermally insulating and/or sound insulating material layer 4 is arranged, said layer being preferably constituted by a polystyrene panel or a foamed layer of expanded polyurethane, as it will become more apparent hereinafter.

More specifically, the armature of the prefabricated structural panel according to the present invention comprises two half armatures 2, each of which is formed by a metal net with longitudinal wires 5 and cross wires 6 which are electrowelded to one another.

To each net 2, and, more specifically, to the longitudinal wires 5 are connected, by welding, the end portions of the cross-members 3.

In particular, the cross-members 3 are preferably welded to the longitudinal wires, by alternating a longitudinal wire 5 with cross-member 3 and a longitudinal wire 5 provided with cross-members 3.

Moreover, the cross-members 3 are preferably mutually aligned and being arranged along lines which are parallel to the cross wires 6.

The two half-armatures 2 are made likewise one another by the same making system or apparatus.

For forming the armature of the structural panel two like half-armatures are used, which are arranged in a mutually facing relationship, with the cross-members 3 of a half-armature 2 facing the cross-members 3 of the other half-armature 2.

Then, the two half-armatures 2 are assembled by welding the apex portions of the cross-members 3 of a half-armature 2 to the longitudinal wires of the other half-armature 2, as clearly shown in figures 4 and 6.

During this assembling operation, it is possible to arrange, between the two half-armatures, a foamed polystyrene panel, or a panel made of any other technically equivalent materials, so as to form the thermally insulating and/or sound insulating layer 4.

Alternately, the thermally insulating and/or sound insulating layer 4 can be embedded, by foaming operations, after having assembled the two half-armatures 2.

The thus obtained structural panel 1 has a very satisfactory stiffness, since it has a grid-like construction.

In particular, the prefabricated structural panel according to the present invention can be used like prior prefabricated structural panels, for making load bearing walls of reduced height buildings, or as a filling or buffering panel for making walls of buildings of a comparatively great height, including a reinforced concrete load bearing construction.

Moreover, the structural panel according to the present invention has a very small weight, which allows the panel to be manually handled, without requiring any lifting apparatus.

From the above disclosure and the observations of the figures of the accompanying drawings, it should be apparent that the invention fully achieves the intended aim and objects.

In particular, the fact is to be pointed out that a prefabricated structural panel has been provided which has a very good mechanical strength, a very reduced weight and which can be produced at a very small cost.

While the prefabricated structural panel according to the present invention has been disclosed and illustrated, by way of a merely indicative, but not limitative example, with reference to preferred embodiments thereof, it should be apparent that the disclosed embodiments are susceptible to several modifications and variations all of which will come within the scope of the appended claims.

In particular, with respect to the thermally insulating and/or sound insulating material layer, though the best results have been obtained by using foamed polystyrene and polyurethane, these materials can be replaced by other technically equivalent materials.

Claims

1. A prefabricated structural panel for making civil or industrial use buildings, characterized in that said panel comprises an armature including two facing metal nets, spaced from one another, and coupled to one another by V shape cross elements, the two

end portions of each said cross member being welded to the wires of one of the two nets and the apex portion thereof being welded to the wires of the other net, at least a thermally insulating and/or sound insulating material layer being arranged between said two nets.

2. A prefabricated structural panel, according to Claim 1, characterized in that said cross-members are welded at the end portions thereof by the longitudinal wires of a net and are mutually aligned along parallel rows to the cross wires of the net.

3. A prefabricated structural panel, according to Claims 1 and 2, characterized in that said cross-members are welded, at the end portions thereof, to the longitudinal wire of a net, by affecting a longitudinal wire each two adjoining longitudinal wires of a same net.

4. A prefabricated structural panel, according to one or more of the preceding claims, characterized in that said armature comprises two like half-armatures each formed by one of said nets and related cross-members, the apex portions of the cross-members of a half-armature being welded to the net of the other half-armature.

5. A prefabricated structural panel, according to one or more of the preceding claims, characterized in that the layer arranged between said two nets comprises foamed polystyrene.

6. A prefabricated structural panel, according to the one or more of the preceding claims, characterized in that said layer arranged between said two nets comprises a foamed material.

7. A prefabricated structural panel, according to the or more of the preceding claims, characterized in that said foamed material comprises foamed polyurethane.

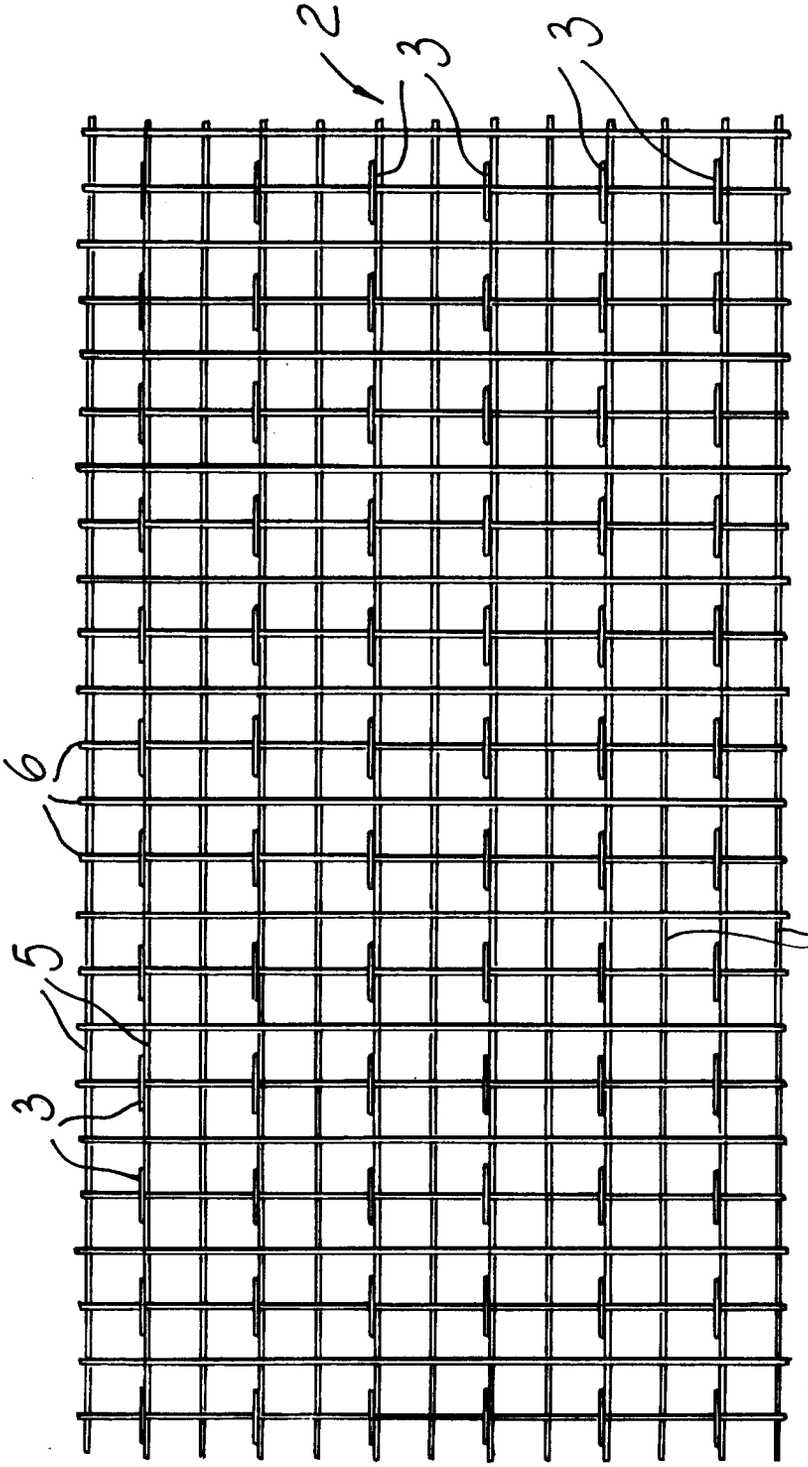

FIG. 1

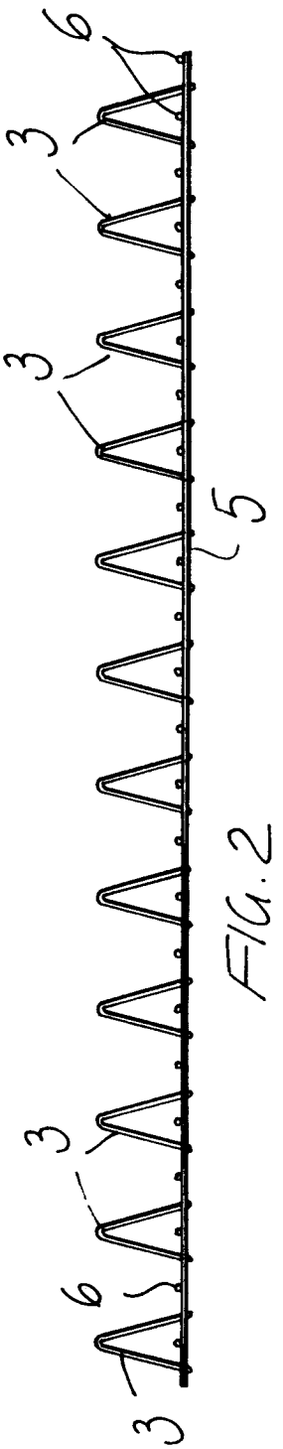

FIG. 2

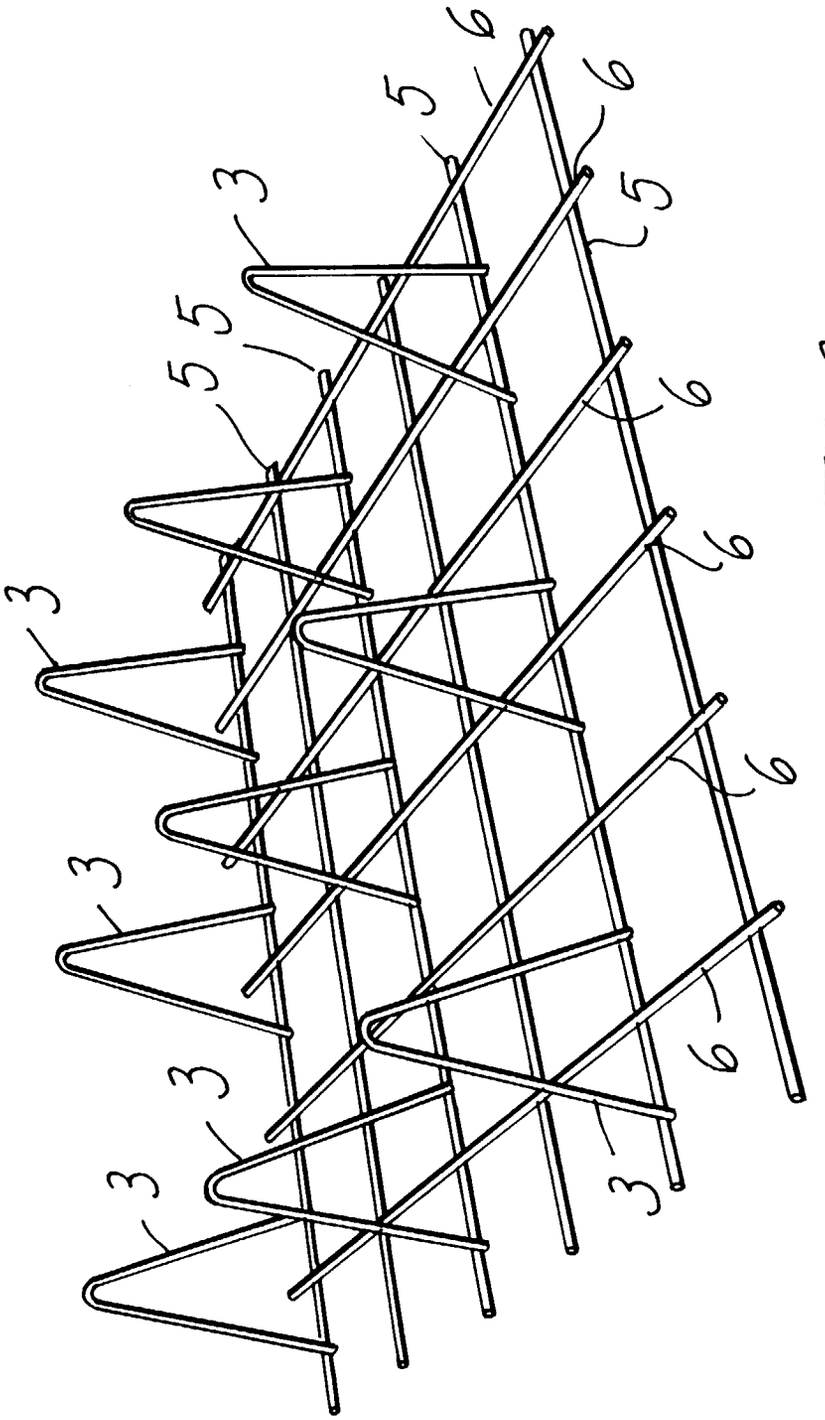

FIG. 3

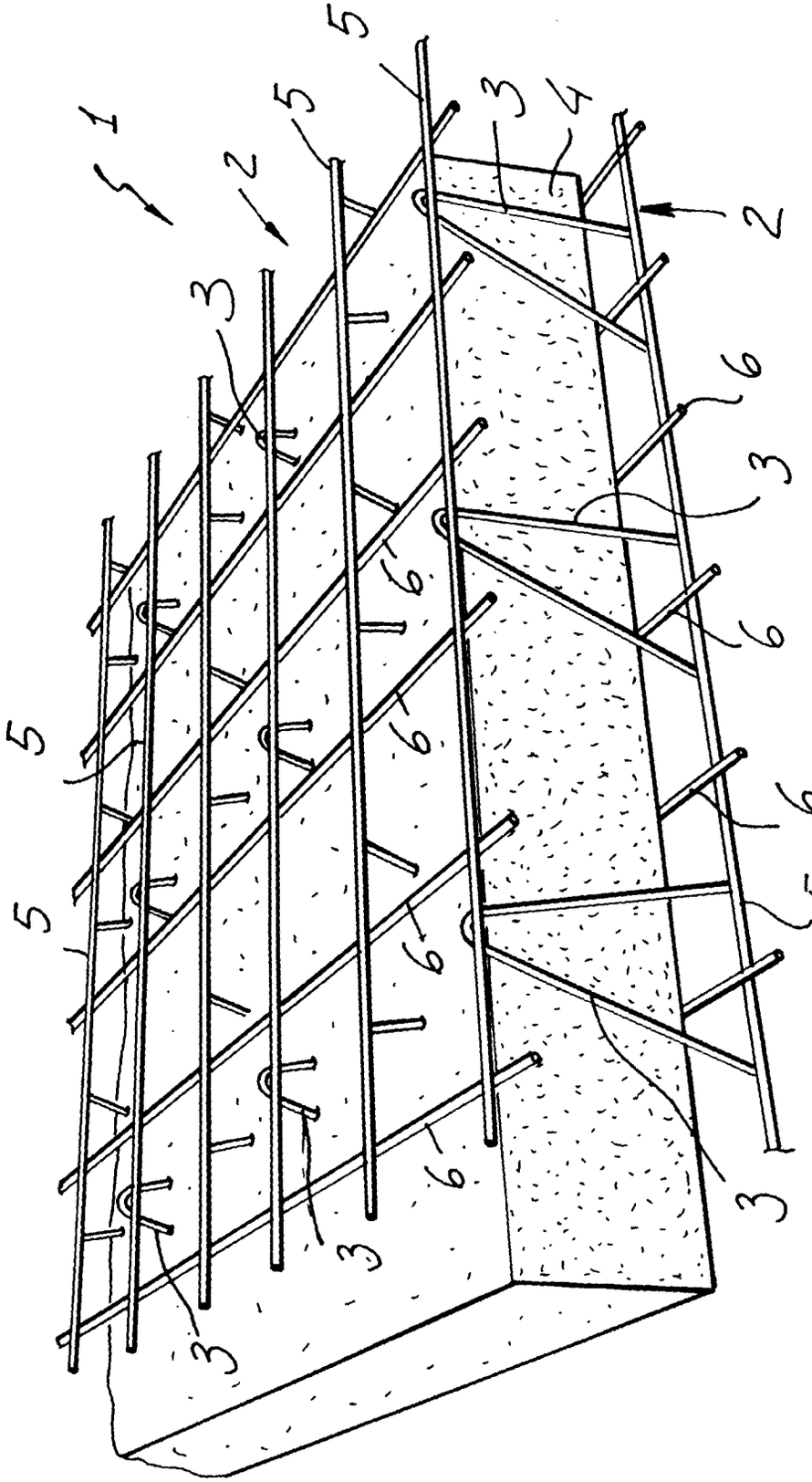

FIG. 4

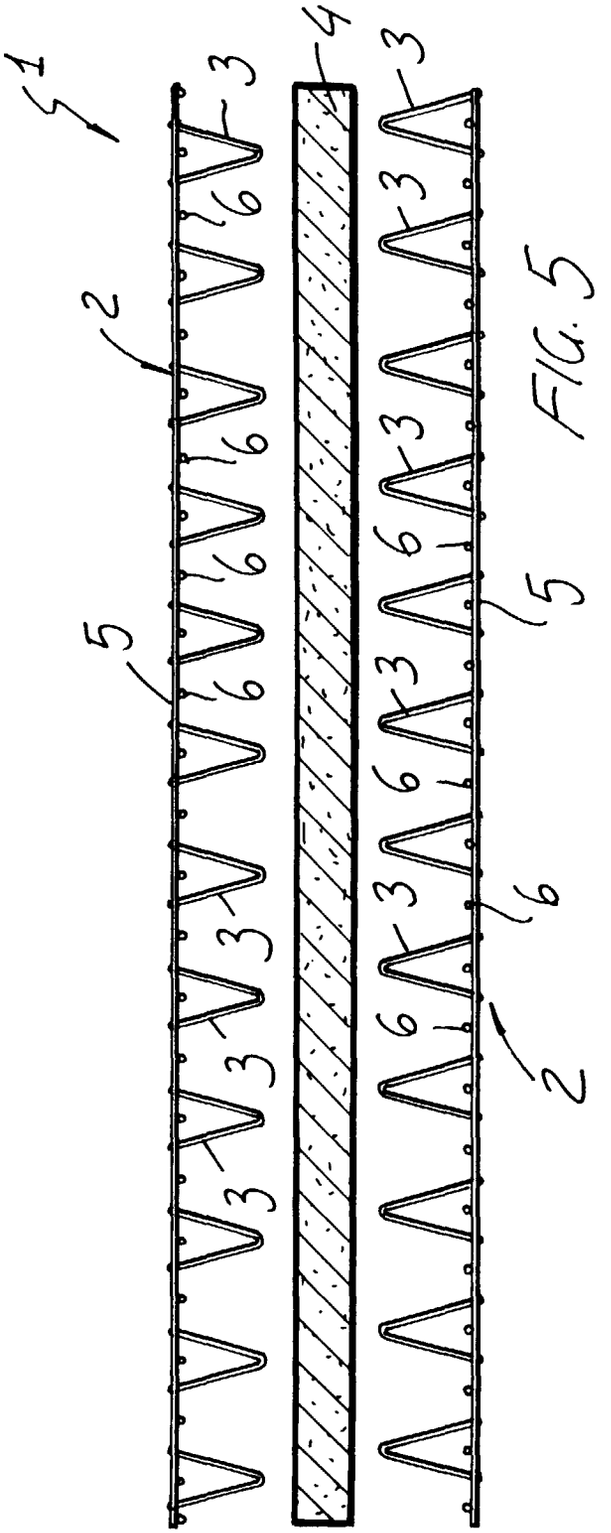

FIG. 5

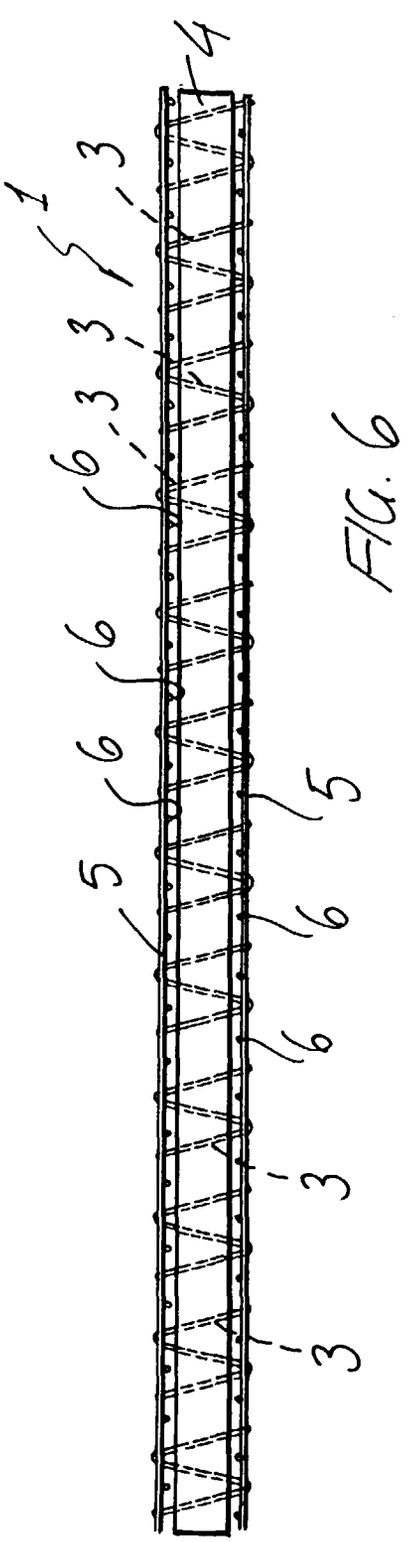

FIG. 6