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(54) Title: A SUPPORT MEMBER USED IN STRUCTURE MEMBERS

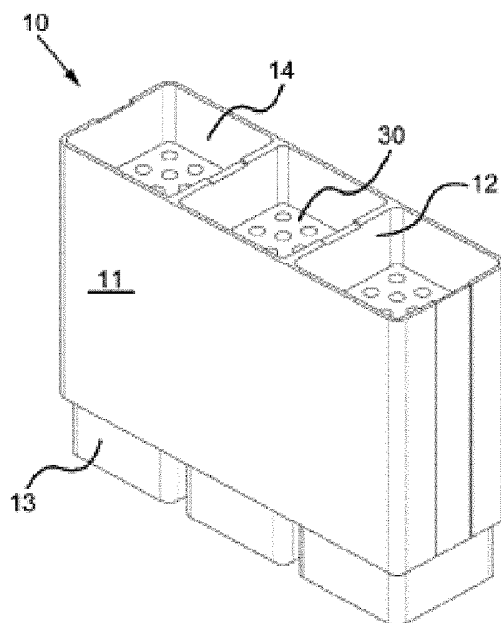


Figure 1

(57) Abstract: The present invention relates to a support member (20, 30) which is in connection to a structure member (10) comprising a body (11) made of composite material and space parts (16) defined inside said body (11), characterized by comprising a body (22, 31) which is placed into said space part (16) and which is made of composite material comprising at least one type of fiber and at least one type of resin; and channels (24, 32) embodied along the length of the body (22, 31) according to a determined placement plan so as to change the movement orbit of ballistic pieces in order to dispense and thereby eliminate the pressure applied on the wall brick (10).



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SPECIFICATION

A SUPPORT MEMBER USED IN STRUCTURE MEMBERS

5 TECHNICAL FIELD

The present invention relates to a support member used in structures in order to provide a safe and secure ambiance.

10 PRIOR ART

Pluralities of safety precautions are taken for the protection of consulates, administrative buildings, plazas and some residences. For these safety precautions, security guards, alarms and camera systems may be used. However, these safety precautions are not sufficient in some cases and particularly in case of ballistic attack, the structure cannot be protected. In order to prevent this, the structures should be improved.

The mostly preferred methods for making structures safer are the usage of bulletproof window glasses and the usage of bulletproof structure members or composite walls in structures. Said bulletproof window glasses provide protection only in the regions where they are positioned and therefore, a limited protection can be provided in the structure. As bulletproof prefabricated structure members or composite walls are used in the whole structure, a completely safe structure can be obtained. However, said materials bring limitations to building of the structure, and as a result of this, the structure cannot be built in the desired manner. In addition, as the composite walls are structured so as to provide sufficient resistance, they are heavy and they have a high cost.

As a result, because of the abovementioned problems, an improvement is required in the related technical field.

30

BRIEF DESCRIPTION OF THE INVENTION

The present invention relates to a support member used together with structure members in composite structures for providing a safe ambiance in terms of ballistics, in order to eliminate the abovementioned problems and to bring new advantages to the related technical field.

35

The main object of the present invention is to provide a support member which is to be used for supporting bricks in structures made of composite in order to prevent the damage which may be caused by ballistic weapons.

- 5 Another object of the present invention is to provide a support member embodied so as to discharge the pressure, applied by weapons, from the structure in order to minimize the damage formed on the structures by ballistic weapons.

10 Another object of the present invention is to provide a support member where steel rods can be placed in order to provide the required resistance in case the structure is attacked by a weapon which is heavily ballistic where the resistance of the composite walls is insufficient.

15 Another object of the present invention is to provide a support member which can be used together with pluralities of support members in the same structure so as to lower the production costs of composite structures which will provide protection against ballistic pieces.

In order to realize all of the abovementioned objects and the objects which are to be obtained from the detailed description below, the present invention is a support member which is in connection to a structure member comprising a body, made of composite material, and space parts defined inside said body. Accordingly, said support member comprises a body
20 which is placed into said space part and which is made of composite material comprising at least one type of fiber and at least one type of resin; and channels embodied along the length of the body according to a determined placement plan so as to change the movement orbit of ballistic pieces in order to provide the dispersion and elimination of the pressure applied on
25 the wall brick.

In a preferred embodiment of the subject matter invention, there are two support members, placed into the structure member, namely, the first support member and the second support member positioned one above the other in the space part.
30

In another preferred embodiment of the subject matter invention, said first support member comprises a bottom body embodied at the continuation of the body and which has a narrower cross section than the body so as to define a peripheral stage on said body.

35 In another preferred embodiment of the subject matter invention, said bottom body is internally placed to the connection extension, which is embodied at the continuation of the space part provided in the structure member.

In another preferred embodiment of the subject matter invention, said stage is placed to the seating frame which is embodied in the part where the separation between the connection extension and the space part is defined.

- 5 In another preferred embodiment of the subject matter invention, the channels of said first and of said second support members are embodied so as to coincide in the same extension direction.

10 In another preferred embodiment of the subject matter invention, the support member has a height so as to define a connection part in the body so that the connection extension of the structure member is placed in order to provide connection of the structure member one above the other.

15 In another preferred embodiment of the subject matter invention, there are iron rods in the channels whose number and position are determined depending on the desired ballistic protection effect.

In another preferred embodiment of the subject matter invention, said channels have circular cross section.

20 In another preferred embodiment of the subject matter invention, said iron rods have circular cross section so as to be compliant to the cross section of channels.

25 In another preferred embodiment of the subject matter invention, at least two of said channels are provided on the same linear line.

30 In another preferred embodiment of the subject matter invention, the subject matter is made of composite material comprising at least one type of fiber at a proportion of 20 % for providing resistance, at least one type of resin with a proportion of 25 %, filling material with a proportion of 45 %, and chemical additive with a proportion of 10 %.

In another preferred embodiment of the subject matter invention, characterized by comprising at least one type of mineral powder which is selected from a mineral group comprising silicon dioxide, barite, talc and calcite as the filling material.

35 In another preferred embodiment of the subject matter invention, as a chemical additive, there is at least one of the chemicals which increase resistance to abrasion, resistance to flame and which increase water absorption.

40 In another preferred embodiment of the subject matter invention, said structure element is a wall brick.

In another preferred embodiment of the subject matter invention, it is a modular structure which is made of structure members wherein the support members are placed.

BRIEF DESCRIPTION OF THE FIGURES

5

In Figure 1, the general view of the wall brick which is the subject matter is given.

In Figure 2, a detailed view of the wall brick which is the subject matter is given.

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In Figure 3a, the general view of the subject matter support member is given.

In Figure 3b, the general view of another subject matter support member is given.

In Figure 4, the top perspective view of the subject matter support member is given.

15

In Figure 5, a view related to the placement of the subject matter support member to a wall brick given.

REFERENCE NUMBERS

20

10 Wall Brick

11 Body

12 Compartment Wall

13 Connection Extension

25

14 Connection Part

15 Seating Frame

16 Space Part

20 First Support Member

21 Lower Body

30

22 Body

23 Stage

24 Channel

30 Second Support Member

31 Body

35

32 Channel

THE DETAILED DESCRIPTION OF THE INVENTION

In this detailed description, the subject matter support member (20, 30) is explained with references to examples without forming any restrictive effect in order to make the subject
5 more understandable. Accordingly, as said support members (20, 30) are positioned into the composite wall brick (10), protection against ballistic weapons is provided.

The composite wall brick (10), whose general view is given in Figure 1, essentially comprises a body (11); space parts (16) which are defined inside said body (11) and wherein the
10 support members (20, 30) are placed; and compartment walls (12) which separate said space parts (16) from each other. The space parts (16), defined by said compartment walls (12), comprise connection extensions (13) embodied at the continuation of the body (11) so as to extend in a separate manner. In the body (11) part from where said connection extensions (13) extend, there is a seating frame (15) embodied along the periphery of the
15 connection extensions (13).

A first support member (20) and a second support member (30) are placed to each space part (16) inside the wall brick (10). The positioning of said first and second support members (20, 30) in the space part (16) is provided firstly by the placement of the first support member
20 (20) and afterwards by the placement of the second support member (30). As this positioning is provided, an exposed region is formed at a position provided above the second support member (30). Said region defines a connection part (14). Said connection part (14) is a region where the connection extensions (13) are seated during the stage of connecting the wall bricks (10) to each other so as to form a structure. The depth of the connection part (14)
25 and the depth of the connection extensions (13) are the same. Thus, a firm connection can be obtained as the wall bricks (10) are connected to each other.

The first support member (20) essentially comprises a bottom body (21) and a body (22) embodied so as to extend at the continuation of each other. The seating region of said
30 bottom body (21) is smaller than the seating region of said body (22). At the part where the bottom body (21) is connected to the body (22), a peripheral stage (23) is formed which results from the seating region which is wider. In the first support member (20), there are channels (24) embodied at a certain placement plan so as to extend both in the bottom body and in the body (21, 22) along the length of the support member (20). Said channels (24) are
35 embodied in a cylindrical form. The second support member (30) is different from the first support member (20) in that the second support member (30) comprises a single body (31). In said second support member (30), there are channels (32) which are embodied at a

certain placement plan so as to extend along the length of the body (31). Said channels (32) are embodied in a cylindrical form.

As the support members (20, 30) are positioned in the space parts, the second support
5 member (30) is placed onto the first support member (20). During this placement, the bottom
body (21) of the first support member (20) is seating into the connection extension (13) of the
wall brick (10). The body (22) is provided in the space part (16) at a position on the
connection extension (21). During the placement, said stage (23) is placed to the seating
frame (15). The bottom body (21) and the body of the second support member (30) have the
10 same seating regions; and a perfect joining is provided during the positioning of the support
members (20, 30) one above the other and the support members (20, 30) are extending
inside the space part (16) as if they were one-piece. The channels (24, 32) provided in the
support members (20, 30) are intersecting with each other and they exist along the length of
the whole wall brick (10) which stays out of the connection part (14).

15

The channels (24, 32) of the support members (20, 30), disperse the pressure into the
support members (20, 30) so as to prevent the harm to the wall brick (10) in case of a
ballistic attack and said channels (24, 32) provide the pressure to be discharged from the
wall structure. Since the channels (24, 32) have a circular cross section, the direction of the
20 ballistic pieces can be changed during advancing of said ballistic pieces inside the support
member (20, 30). Moreover, the direction changing of the ballistic pieces inside the support
member (20, 30) depends on the cross sectional shape of the channels (24, 32) and also
depends on the placement plan of the channels (24, 32). The placement plan of the channels
(24, 32) is determined so that at least two channels (24, 32) are provided on the linear lines.
25 Thus, during the movement of the ballistic pieces in the support member (20, 30), an efficient
dampening can be provided since the ballistic pieces hit channels (24, 32) provided one after
the other.

In cases of ballistic attack where support members (20, 30) are not sufficient, iron rods are
30 placed into the channels (24, 32). These iron rods pass through the first and the second
support members (20, 30) and they extend along the whole wall brick (10). Since the iron
rods are positioned inside the channels (24, 32) according to a placement plan and since the
ballistic pieces are moving by changing direction inside the support members (20, 30), the
speed of the ballistic piece decreases and the effect of the ballistic piece is spread into the
35 whole of the support member (20, 30). After the ballistic piece is hitting an iron rod provided
in a channel (24, 32), the ballistic piece is directed towards another iron rod according to the
placement plan; and the force of the ballistic piece is dampened.

There may be two support members (20, 30), or the support member can be produced in a one-piece manner. In both cases, the operation of the support members (20, 30) will not change, however, in case of production in one-piece form, the costs of the press mold are increasing. Since this increases the cost of said support member (20, 30), the support
5 members (20, 30) are produced in the form of two pieces which complete one another.

The composite material, of which the subject matter support members (20, 30) are made, is obtained by a molding method called SMC. The composite material comprises resin, fiber, filling materials and chemical additives. Resin is functioning as a binding material inside the
10 composite structure. As a fiber, glass fiber is used for improving drawing and bending properties and for eliminating the brittle structure of resin.

Accordingly, a preferred formulation comprises at least one type of fiber at a proportion of 20 % for providing resistance to the composite material, at least one type of resin with a
15 proportion of 25 %, mineral powder with a proportion of 45 % as a filling material, and chemical additive with a proportion of 10 %. In the composite material, a mineral powder is used which is selected from a mineral group comprising silicon dioxide, barite, talc and calcite as the filling material. In the composite material, the mineral powder, which is used
20 particularly for providing resistance to the ballistic weapons, is barite and it forms 10 % of the material composition. As a chemical additive, at least one of the chemical substances is used, which increases resistance to abrasion, resistance to flame and which increases water absorption.

The protection scope of the present invention is set forth in the annexed Claims and cannot
25 be restricted to the illustrative disclosures given above, under the detailed description. It is because a person skilled in the relevant art can obviously produce similar embodiments under the light of the foregoing disclosures, without departing from the main principles of the present invention.

CLAIMS

1. A support member (20, 30) which is in connection to a structure member (10) comprising a body (11), made of composite material, and space parts (16) defined inside said body (11), **characterized** by comprising a body (22, 31) which is placed into said space part (16) and which is made of composite material comprising at least one type of fiber and at least one type of resin; and channels (24, 32) embodied along the length of the body (22, 31) according to a determined placement plan so as to change the movement orbit of ballistic pieces in order to provide dispersion and elimination of the pressure applied on the wall brick (10).
2. A support member (20, 30) according to Claim 1, characterized by comprising two support members (20, 30), placed into the structure member (10), namely, the first support member (20) and the second support member (30) positioned one above the other in the space part (16).
3. A support member (20, 30) according to Claim 1 or 2, characterized in that said first support member (20) comprises a bottom body (21) embodied at the continuation of the body (22) and which has a narrower cross section than the body (22) so as to define a peripheral stage (23) on said body (22).
4. A support member (20, 30) according to Claim 3, characterized in that said bottom body (21) is internally placed to the connection extension (13), which is embodied at the continuation of the space part (16) provided in the structure member (10).
5. A support member (20, 30) according to any one of the preceding claims, characterized in that said stage (23) is placed to the seating frame (15) which is embodied in the part where the separation between the connection extension (13) and the space part (16) is defined.
6. A support member (20, 30) according to Claim 2, characterized in that the channels (24, 32) of said first and of said second support members (20, 30) are embodied so as to coincide in the same extension direction.
7. A support member (20, 30) according to any one of the preceding claims, characterized in that the support member (20, 30) has a height so as to define a connection part (14) in the body (11) so that the connection extension (13) of the structure member (10) is placed in order to provide connection of the structure member (10) one above the other.

8. A support member (20, 30) according to any one of the preceding claims, characterized by comprising iron rods in the channels (24, 32) whose number and position are determined depending on the desired ballistic protection effect.
- 5
9. A support member (20, 30) according to any one of the preceding claims, characterized in that said channels (24, 32) have circular cross section.
- 10
10. A support member (20, 30) according to Claim 9, characterized in that said iron rods have circular cross section so as to be compliant to the cross section of channels (24, 32).
- 15
11. A support member (20, 30) according to any one of the preceding claims, characterized in that at least two of said channels (24, 32) are provided on the same linear line.
- 20
12. A support member (20, 30) according to any one of the preceding claims, characterized in that it is made of composite material comprising at least one type of fiber at a proportion of 20 % for providing resistance, at least one type of resin with a proportion of 25 %, filling material with a proportion of 45 %, and chemical additive with a proportion of 10 %.
- 25
13. A support member (20, 30) according to Claim 13, characterized by comprising at least one type of mineral powder which is selected from a mineral group comprising silicon dioxide, barite, talc and calcite as the filling material.
- 30
14. A support member (20, 30) according to Claim 13, characterized in that as a chemical additive, there is at least one of the chemicals which increases resistance to abrasion, resistance to flame and which increases water absorption.
- 35
15. A support member (20, 30) according to any one of the preceding claims, characterized in that said structure element (10) is a wall brick.
16. A support member (20, 30) according to any one of the preceding claims, characterized in that it is a modular structure which is made of structure members (10) wherein the support members (20, 30) are placed.

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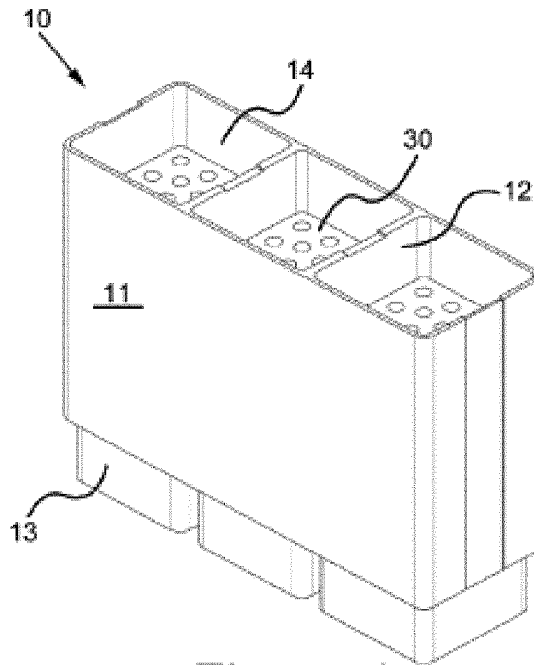


Figure 1

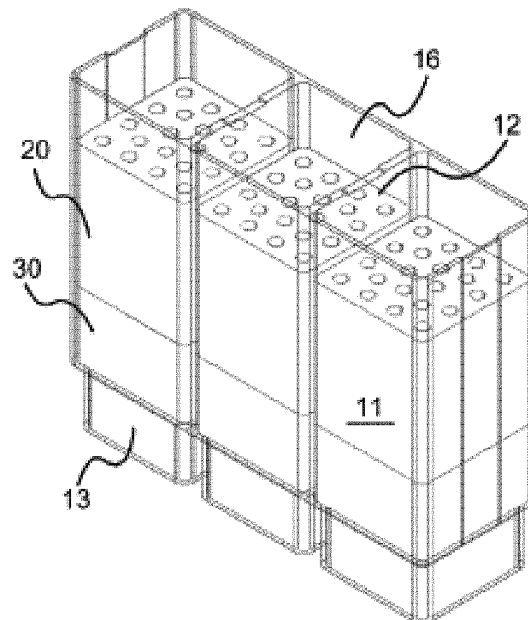


Figure 2

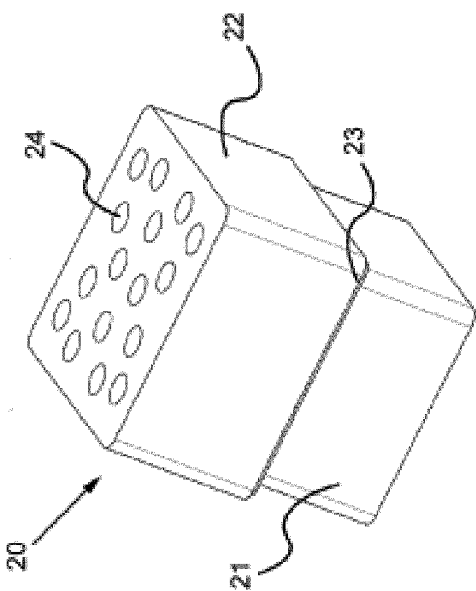


Figure 3a

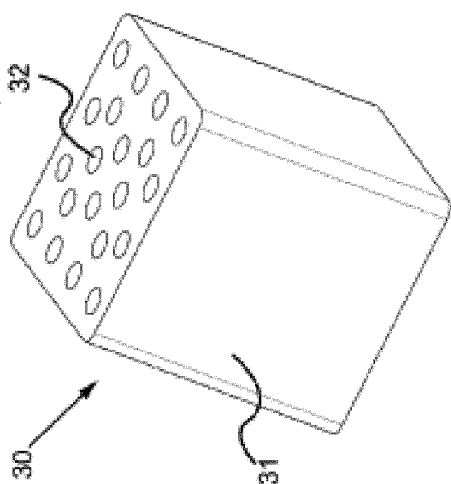


Figure 3b

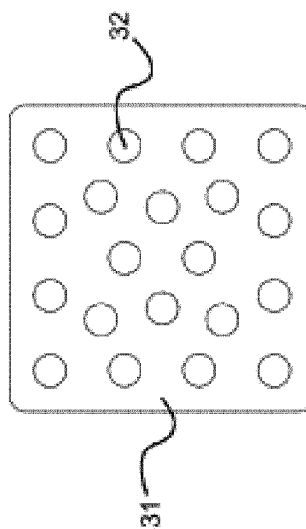


Figure 4

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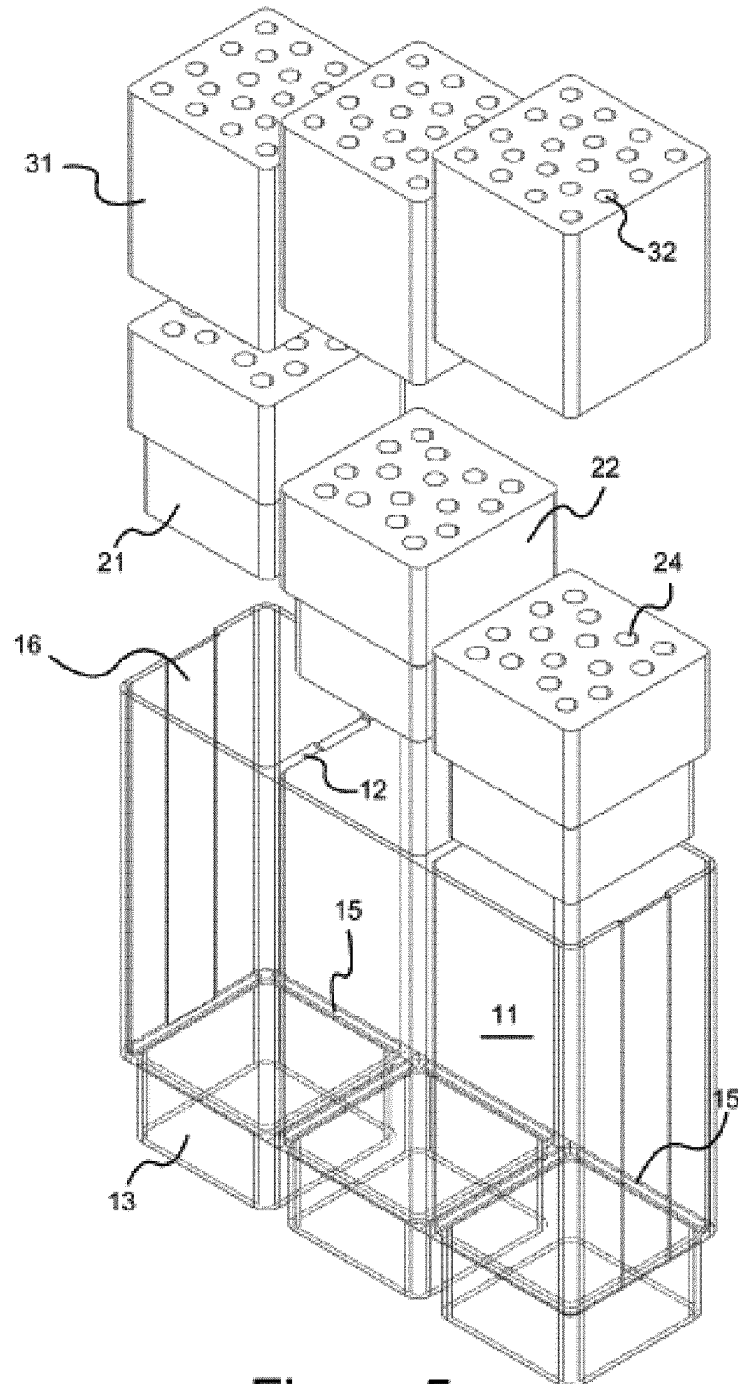


Figure 5