

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) Publication number:

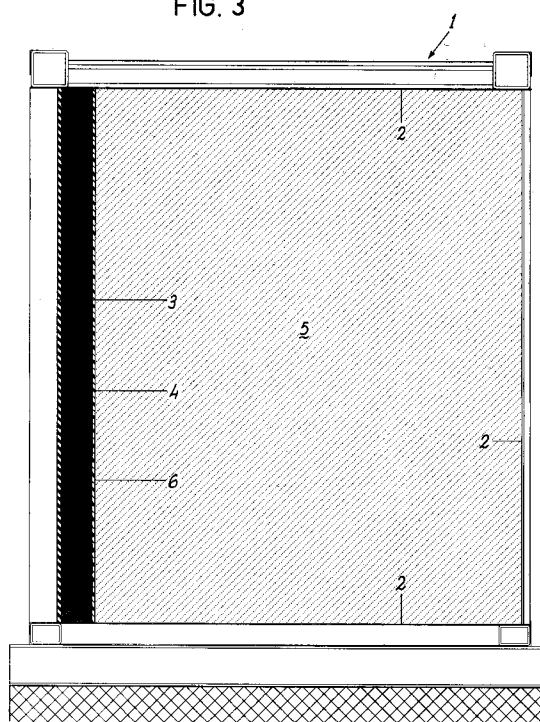
0 683 375 A1

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **95830202.8**(51) Int. Cl.⁶: **F41J 1/12**(22) Date of filing: **15.05.95**(30) Priority: **16.05.94 IT RM940302**(43) Date of publication of application:
22.11.95 Bulletin 95/47(84) Designated Contracting States:
CH DE DK ES FR GB IT LI NL SE(71) Applicant: **IMPRESA COSTRUZIONI Soc.
FRA.SA. a R.L.
Via Groenlandia 31
I-00144 Rome (IT)**(72) Inventor: **Salabe, Andrea, Impresa
Costruz.Soc. FRA.SA. a R.L.
Via Groenlandia 31
I-00187 Roma (IT)**(74) Representative: **Iannone, Carlo Luigi
Ing. Barzanò & Zanardo Roma S.p.A.
Via Piemonte, 26
I-00187 Roma (IT)**(54) **Absorption projectile arrester.**

(57) The invention concerns an absorption projectile arrester (1) of the type insertable within a container and having all the walls (2), except the wall faced toward the shooters, made up of ballistic sheet, the surface (3) of the projectile arrester faced toward the shooters being made up of a rubber shield, behind the shield, granular material (5) being provided, and between said granular material (5) and said shield (3), means (4; 7; 8) for sustaining the thrust of the granular material and a layer (6; 7; 8) allowing the passage of the undeformed projectiles being provided, said layer does not tear or permanently deform after the passage of the projectiles.

FIG. 3

**EP 0 683 375 A1**

The present invention relates to an absorption projectile arrester.

More specifically, the invention concerns an absorption projectile arrester of the cartridge type, particularly suitable for the 3rd class firearms (up to 3000 J).

During the recent years, many solution have been proposed, also and particularly by the same Applicant, in order to try to realize projectile arresters suitable for the different requirements.

Among the requirements, it particularly important the one concerning the safety.

Further, the projectile arrester provided according to the present invention realizes an extremely easy solution under a constructive point of view.

Another object of the present invention is that of providing a projectile arrester easily transportable, particularly, although not exclusively, within ISO containers.

It is a further object of the present invention that of providing a projectile arrester that avoids the harmful creation of lead vapors in the environment, due as it is known to the impact of the projectiles.

This and other results are obtained according to the present invention providing a technical solution to realize a projectile arrester of the so called cartridge type, wherein in order to decelerate the projectiles a material is employed that does not permanently deforms and that does not tears for the passage of the projectiles through it.

It is therefore specific object of the present invention an absorption projectile arrester of the type insertable within a container and having all the walls, except the wall faced toward the shooters, made up of ballistic sheet, the surface of the projectile arrester faced toward the shooters being made up of a rubber shield, behind the shield granular material being provided, and between said granular material and said shield means for sustaining the thrust of the granular material and a layer allowing the passage of the undeformed projectiles being provided, said layer does not tear or permanently deform after the passage of the projectiles.

Preferably, according to the invention, said ballistic sheets have a total inner lining.

Still according to the invention, said projectile arrester is contained within an ISO container having dimension normally transportable.

Always according to the invention, said shield faced toward the shooters is realized by para rubber and is perimetrically fixed.

According to a first embodiment of the projectile arrester of the invention, said means for sustaining the thrust of the granular material are made up of a plurality of hardened steel vertical elements, fixed to the ballistic sheets of the floor and of the roof, and said layer is made up of a plastic

diaphragm transparent with respect to the projectiles and realized with a material that does not tear for the passage of the same undeformed projectiles, i.e. the projectiles that have not previously impacted against other structures of the projectile arrester, and the closes again after the passage of the projectile.

According to a further embodiment of the projectile arrester according to the invention, said means for sustaining the thrust and said layer are made up of a plurality of blocks of plastic material with a very high ductility, provided in such a way that they close all the surface faced toward the shooters, and that allow the passage of the projectiles without cracks and able to sustain the horizontal thrust.

Still according to an embodiment of the projectile arrester according to the invention, said means for sustaining the thrust and said layer are made up of a layer comprised of pressed and glued elastomeric granular material blocks.

Further according to the invention, said means for sustaining the thrust and said layer are made up of rubber vertical elements.

Still according to the invention behind said back wall of the projectile arrester, an inspection passage reachable by the operators can be provided.

Further, according to the invention, between said means for sustaining the thrust of the granular material and the back wall of the projectile arrester ballistic sheet transverse walls can be provided.

According to the invention, said granular material placed behind the front shield is elastomeric granular material.

The present invention will be now described for illustrative, but not limitative purposes, according to its preferred embodiments, with particular reference to the figures of the enclosed drawings, wherein:

figure 1 is a plan view of a first embodiment of the ballistic projectile arrester according to the invention;

figure 2 shows a particular of the ballistic projectile arrester of figure 1;

figure 3 is a section view of the ballistic projectile arrester of figure 1;

figure 4 is a section view of a second embodiment of the ballistic projectile arrester according to the invention;

figure 5 shows a particular of the projectile arrester of figure 4;

figure 6 is a section view of a third embodiment of the ballistic projectile arrester according to the invention;

figure 7 shows a particular of the projectile arrester of figure 6;

figure 8 is a perspective view of a further embodiment of the projectile arrester according to the invention; and

figure 8 is a perspective view of a further embodiment of the projectile arrester according to the invention.

Making first reference to the figures 1-3, it is shown a ballistic projectile arrester 1 according to the invention that, in the embodiment shown is depicted included within an ISO container, having normally transportable dimensions.

Said projectile arrester 1 can be installed within already existing rooms.

As already said, it can be contained in any metallic structure having a rectangular or cylindrical shape.

The projectile arrester 1 according to the invention provides walls 2 made up of ballistic sheet with an inner total lining, except for the surface faced toward the shooters.

Said surface faced toward the shooters is closed by a para rubber shield 3, perimetrically fixed.

Within said shield 3, on the surface faced toward the shooters, a plurality of vertical elements 4 is provided, realized by hardened steel, fixed to the ballistic sheets 2 of the floor and of the roof.

The vertical elements are suitable to sustain the thrust of the elastomeric granular material 5 provided behind them.

Between the vertical elements 4 and the elastomeric granular material 5, a plastic diaphragm 6 is provided, having features making it "transparent" with respect to the projectiles striking it with a direct trajectory.

On other words, said diaphragm 6 allows the passage of the projectile without any deformation of the same along the thickness of the diaphragm, without being torn and closing again after the passage of the projectile.

The granular material 5 provided behind said diaphragm will have a suitable thickness in order to absorb the energy of the projectiles shoot by the abovementioned type of arms, corresponding to 3600 J.

As it will be easily understood by those skilled in the art, the solution proposed according to the present invention is particularly advantageous since allows to absorb projectile of the third class firearms without deforming the projectiles, thus avoiding the problems connected with the production of harmful vapors as occurs in the traditional projectile arresters.

Making reference to the figures 4, and 5 and 6 and 7, the parts of the projectile arrester corresponding to the parts of the preceding embodiment are indicated by the same references.

Observing first the figures 4 and 5, it can be noted a solution wherein the structure realized in the preceding embodiment by the hardened steel vertical elements 4 and by the plastic diaphragm 6 has been replaced by a plurality of blocks 7.

Said block 7 are realized by plastic material having a very high ductility. The features of the material by which the blocks are realized are such that they allow the passage of the projectile without any damage for the projectiles.

The blocks 7 are provided in such a way to completely close the front surface, faced toward the firing trajectory from the firearms.

Further, they must be able to sustain the horizontal thrust imposed behind by the granular material 5.

Coming now to observe figures 6 and 7, it is shown a further embodiment, structurally very similar to the embodiment shown in figures 4 and 5.

In this case, instead of the plastic blocks 7, blocks 8 are provided realized using pressed and glued elastomeric granular material.

Also the material employed to realize the blocks 8 must allow to the blocks to have the mechanical features previously indicated, so as to realize a stopping structure for the projectiles having the abovementioned advantages.

Referring now to figure 8, it is shown a further embodiment of the projectile arrester according to the invention, structurally equal to the ones previously described, with the sole difference that in this case instead of the steel vertical elements 4, rubber elements or supports 9 are provided.

The other technical features of the projectile according to the invention correspond to those of the preceding embodiments, so that the same references are used.

Above the elastomeric granular material 5, as well as in the previous embodiments, ballistic sheet baffle plates 10 are provided.

The embodiment illustrated in figure 9 in somewhat different with respect to those previously described. In this case too, for the corresponding parts, the same references have been used.

In the solution shown, a granular material 5' is employed that allows to reduce the thickness of the absorption mass.

In this it is possible to provide behind the mass of granular material an inspection passage reachable by the door 11.

In this solution, it is not necessary to provide the baffle plates 10.

Each one of the described solutions making reference to the different figures can provide transverse walls between the single elements 4, 7, 8 or 9 and the back wall 2 of the projectile arrester in order to realize many little rooms of granular material 5 or 5'.

The present invention has been described for illustrative, but not limitative purposes, according to its preferred embodiments, but it should be understood that modifications and/or changes can be introduced by those skilled in the art without departing from the relevant scope, as defined in the enclosed claims.

Claims

1. Absorption projectile arrester characterized by the fact of being of the type insertable within a container, by the fact of having all the walls, except the wall faced toward the shooters, made up of ballistic sheet, and by the fact that the surface of the projectile arrester faced toward the shooters is made up of a rubber shield, behind the shield granular material being provided, and between said granular material and said shield means for sustaining the thrust of the granular material and a layer allowing the passage of the undeformed projectiles being provided, said layer does not tear or permanently deform after the passage of the projectiles.
2. Absorption projectile arrester according to claim 1, characterized in that said ballistic sheets have a total inner lining.
3. Absorption projectile arrester according to claim 1 or 2, characterized in that said projectile arrester is contained within an ISO container having dimension normally transportable.
4. Absorption projectile arrester according to claim 1, 2, or 3, characterized in that said shield faced toward the shooters is realized by para rubber.
5. Absorption projectile arrester according to claim 1, 2, 3 or 4, characterized in that said shield faced toward the shooters is perimetrically fixed.
6. Absorption projectile arrester according to claim 1, 2, 3, 4 or 5, characterized in that said means for sustaining the thrust of the granular material are made up of a plurality of hardened steel vertical elements, fixed to the ballistic sheets of the floor and of the roof, and said layer is made up of a plastic diaphragm transparent with respect to the projectiles and realized with a material that does not tear for the passage of the same undeformed projectiles, i.e. the projectiles that have not previously impacted against other structures of the projectile arrester, and the closes again after the

passage of the projectile.

7. Absorption projectile arrester according to claim 1, 2, 3, 4 or 5, characterized in that said means for sustaining the thrust and said layer are made up of a plurality of blocks of plastic material with a very high ductility, provided in such a way that they close all the surface faced toward the shooters, and that allow the passage of the projectiles without cracks and able to sustain the horizontal thrust.
8. Absorption projectile arrester according to claim 1, 2, 3, 4 or 5, characterized in that said means for sustaining the thrust and said layer are made up of a layer comprised of pressed and glued elastomeric granular material blocks.
9. Absorption projectile arrester according to one of the claims 1 - 5, characterized in that said means for sustaining the thrust and said layer are made up of rubber vertical elements.
10. Absorption projectile arrester according to one of the preceding claims, characterized in that behind said back wall of the projectile arrester, an inspection passage reachable by the operators can be provided.
11. Absorption projectile arrester according to one of the preceding claims, characterized in that between said means for sustaining the thrust of the granular material and the back wall of the projectile arrester ballistic sheet transverse walls can be provided.
12. Absorption projectile arrester according to one of the preceding claims, characterized in that above said granular material, baffle plates are provided.
13. Absorption projectile arrester according to one of the preceding claims, characterized in that said granular material placed behind the front shield is elastomeric granular material.

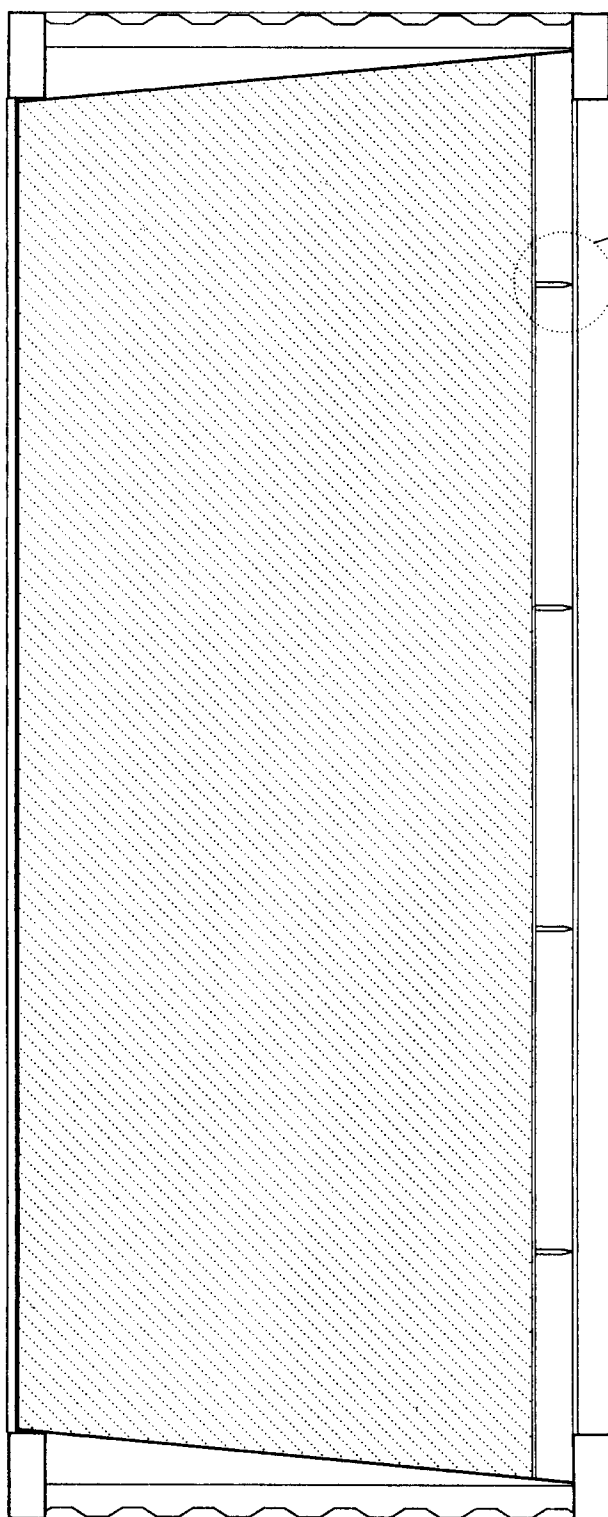


FIG. 1

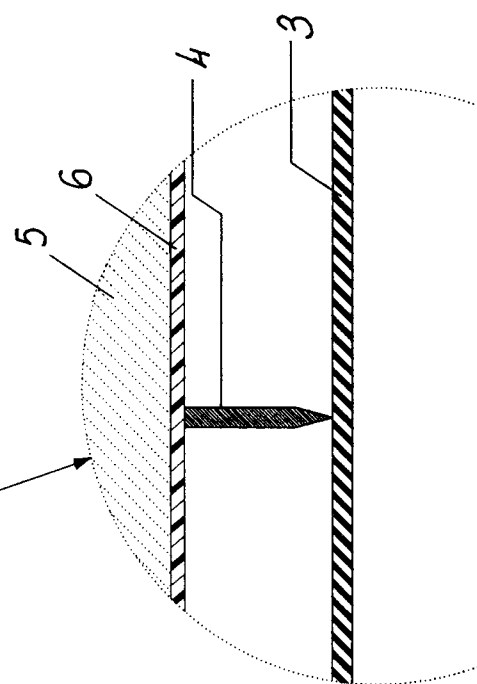


FIG. 2

FIG. 3

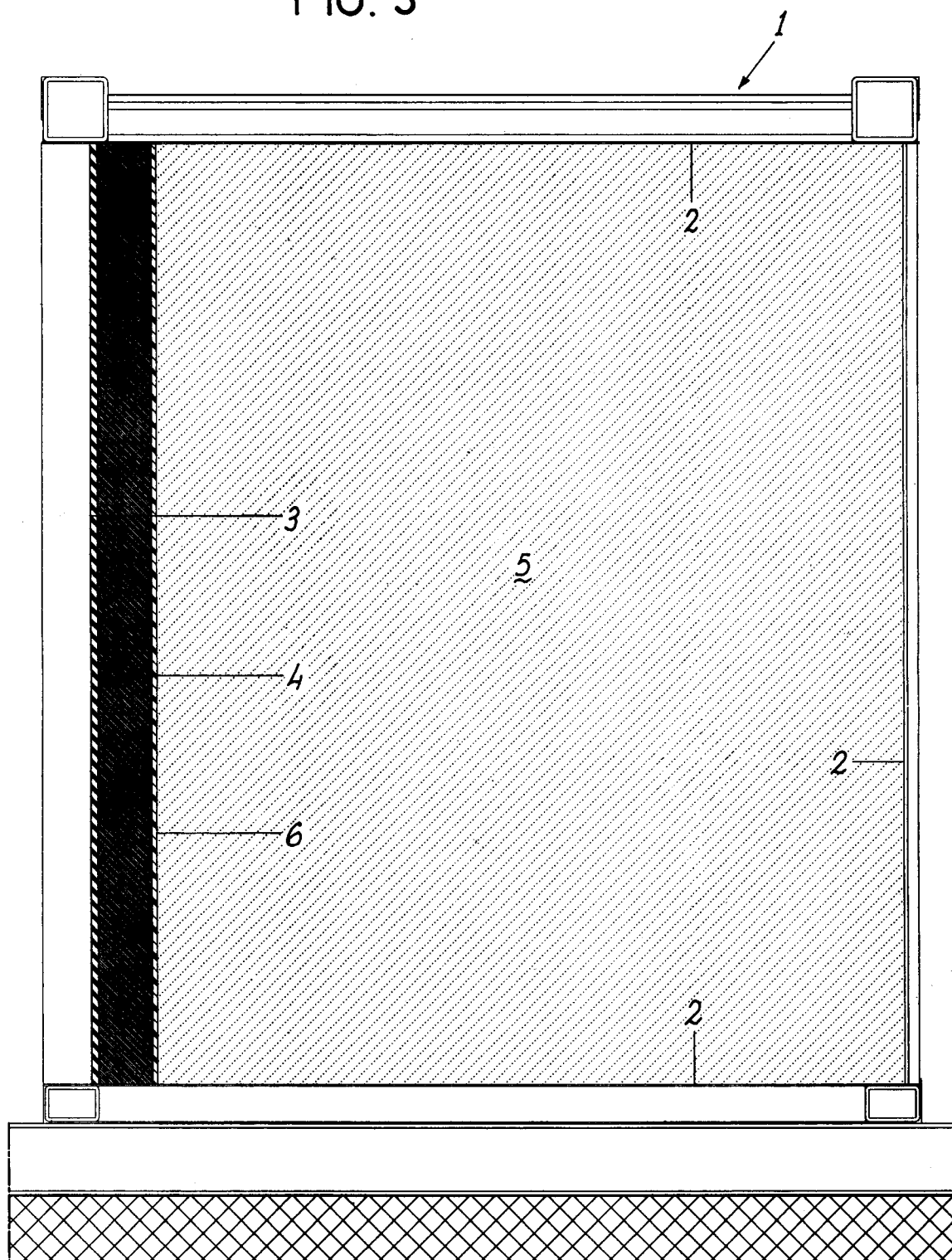
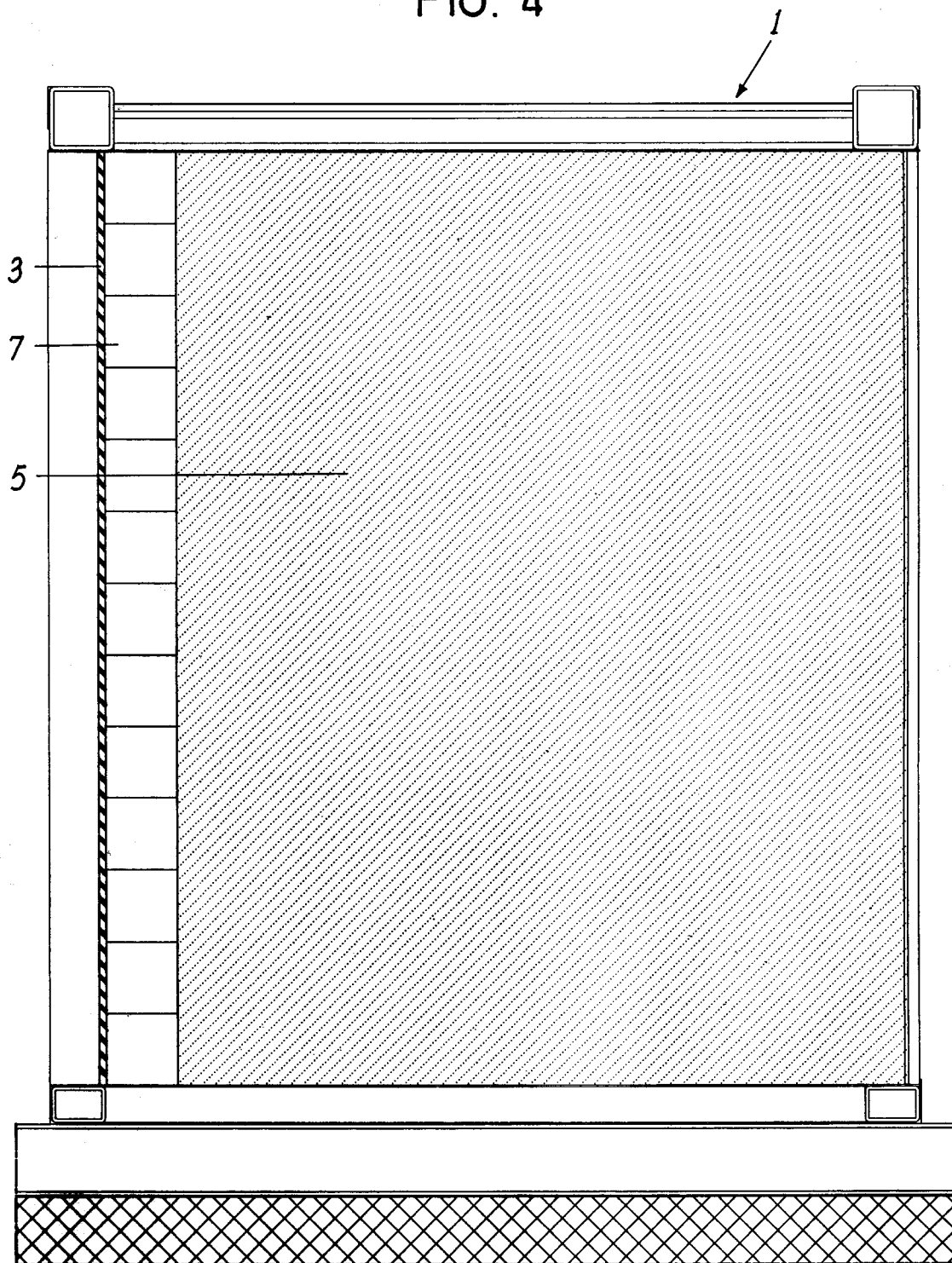


FIG. 4



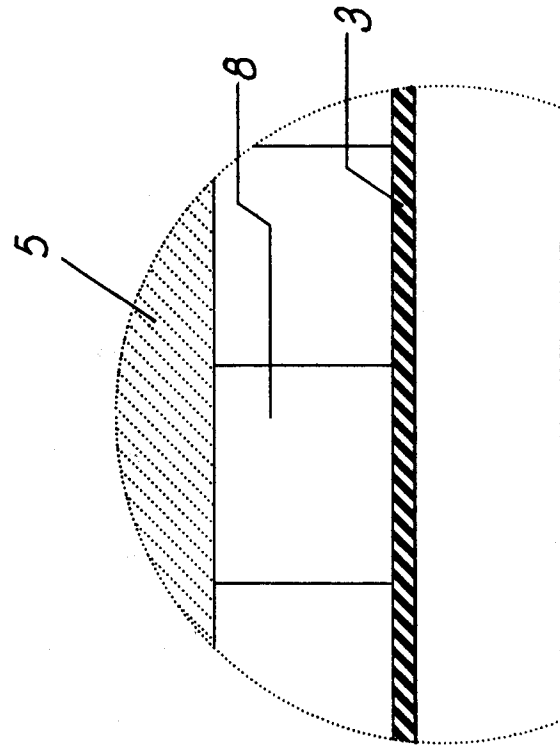


FIG. 7

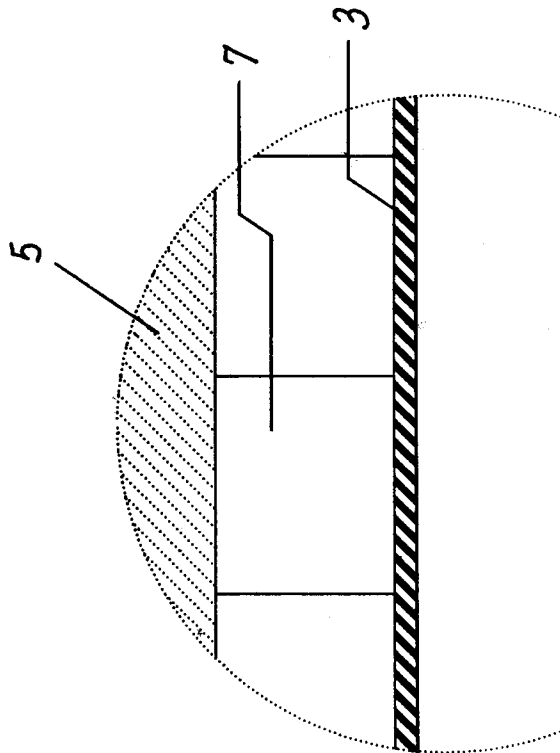
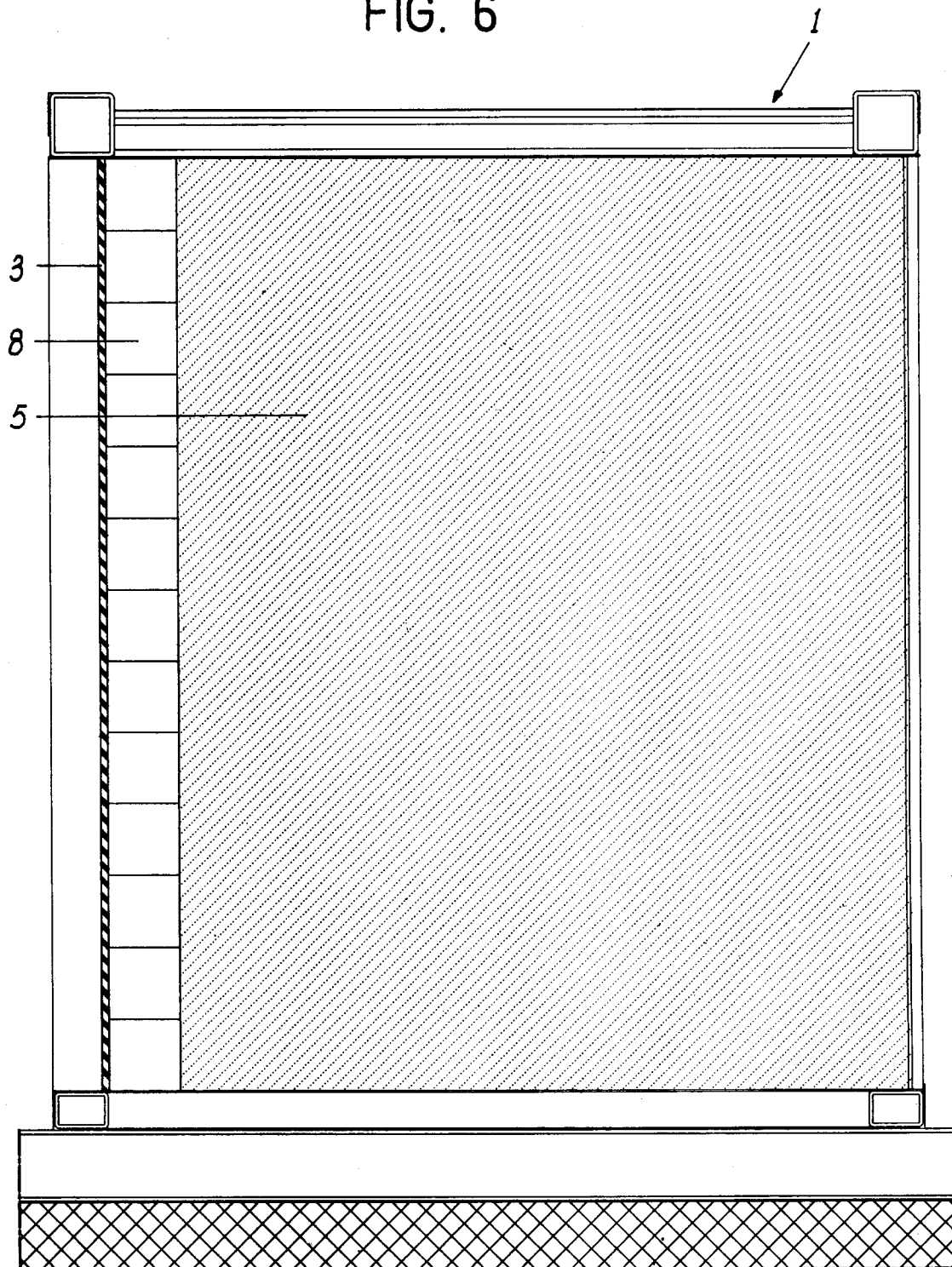


FIG. 5

FIG. 6



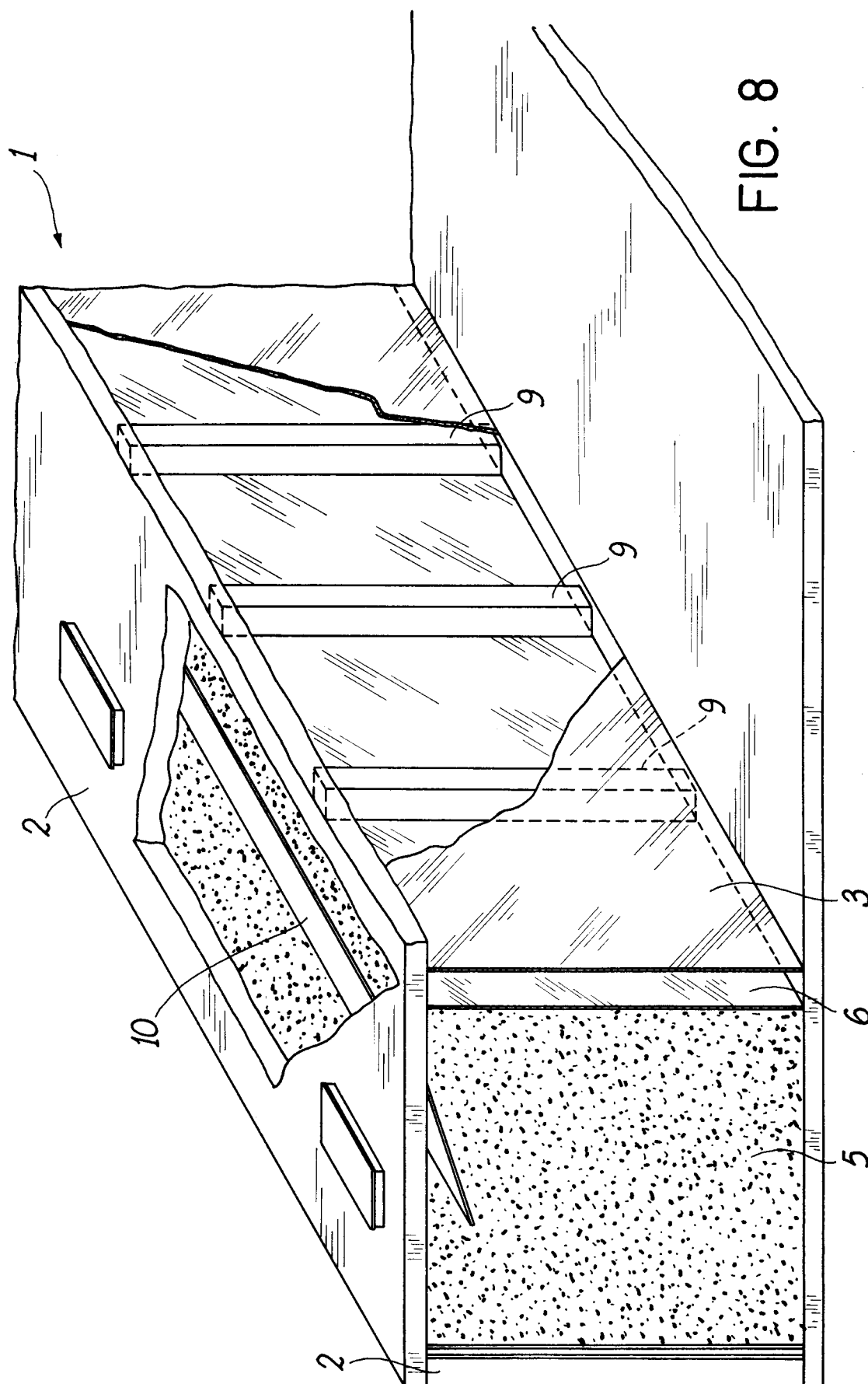
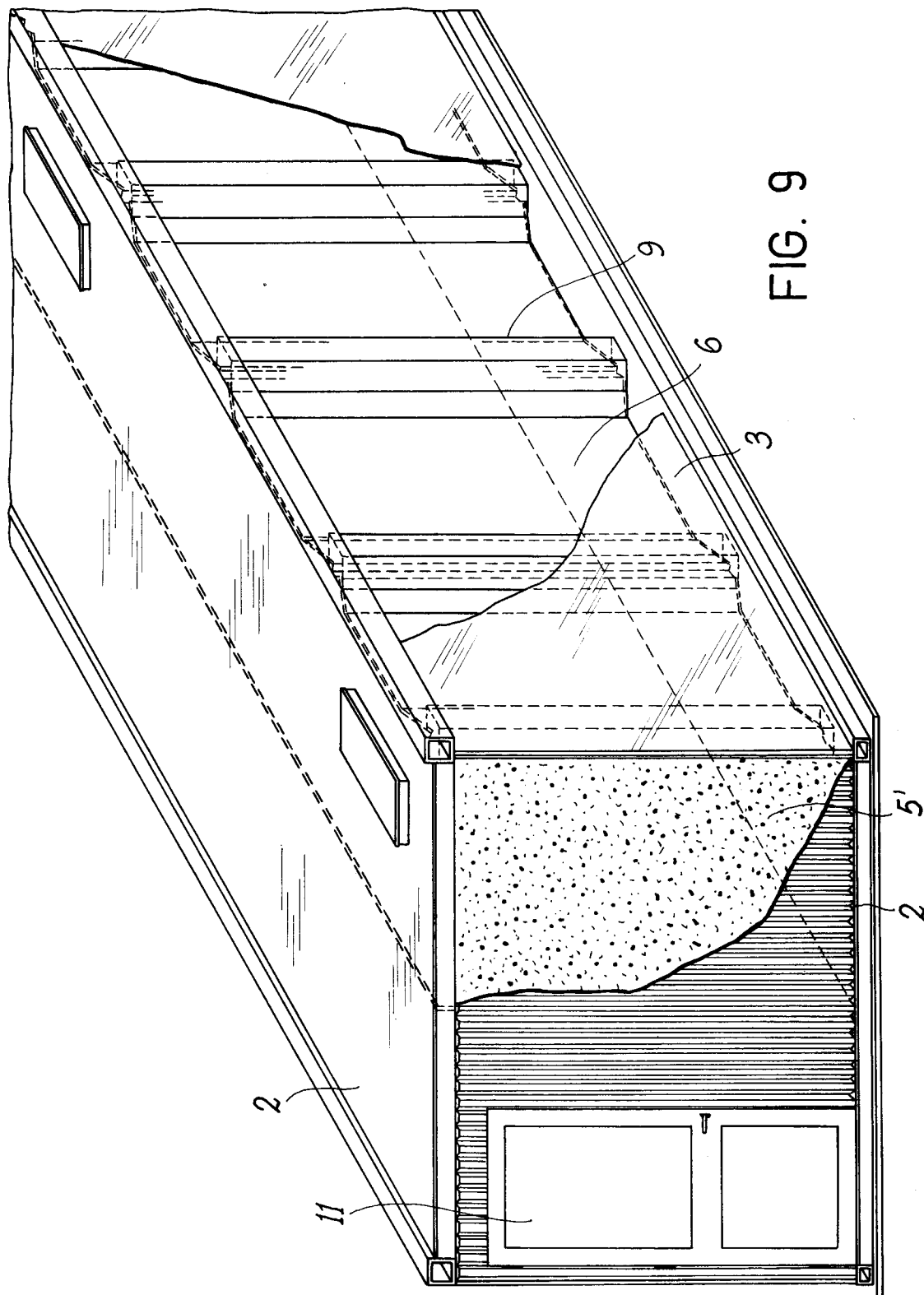


FIG. 8





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 83 0202

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	DE-A-28 39 509 (WOJCINSKI) * page 27, line 18 - page 28, line 4; figures 11,12 *	1-5	F41J1/12
Y	GB-A-2 242 730 (VERTANNESS) * page 3, line 15 - page 4, line 13; figures *	1-5	
A	DE-A-32 12 781 (GFL-SPORTSTETTENBAU) * page 8, line 7 - page 9, line 2; figures *	1	
A	US-A-4 819 946 (KAHLER) * column 2, line 66 - column 4, line 19; figures *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			F41J
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29 August 1995	Examiner Olsson, B
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			