(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 923 521 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.05.2008 Bulletin 2008/21

(51) Int Cl.:
E04D 3/35 *(2006.01)*

(21) Application number: **07022193.2**

(22) Date of filing: **15.11.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

(30) Priority: **16.11.2006 IT MI20062206**

(71) Applicant: **MIRPLAST S.r.l.**
20123 Milano (IT)

(72) Inventor: **Iride, Vincenzo**
20123 Milano (IT)

(74) Representative: **Cicogna, Franco**
Ufficio Internazionale Brevetti
Dott.Prof. Franco Cicogna
Via Visconti di Modrone, 14/A
20122 Milano (IT)

(54) Modular covering element for covering buildings in general

(57) The present invention relates to a modular covering element for covering buildings in general, which comprises a holding bottom layer, on a perimetrical part thereof are arranged a plurality of gasket strips defining a receiving or housing region for a filling foamed material.

On the top of this construction is arranged a wave shaped plate having a coating on an outer face thereof.

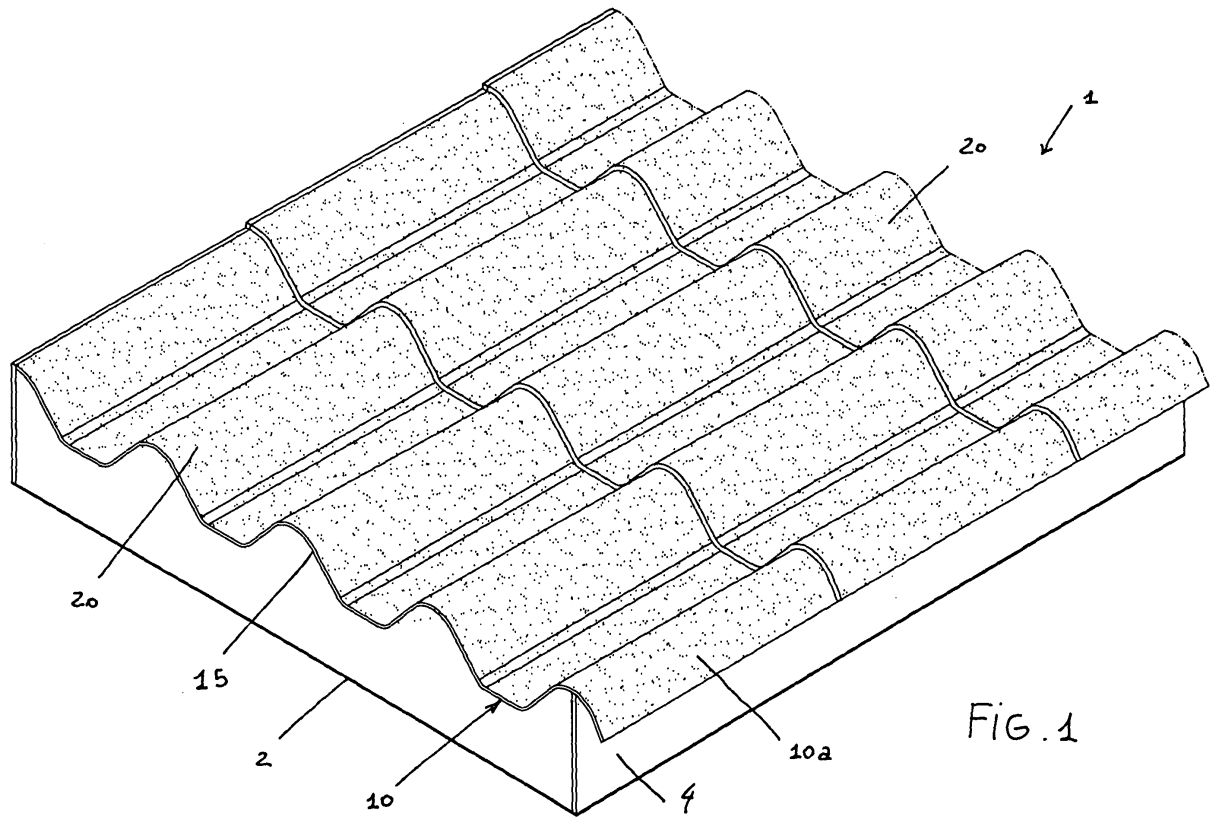

FIG. 1

EP 1 923 521 A1

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a modular covering element for covering buildings in general.

[0002] Covering elements comprising a plurality of modular plates to be mutually coupled so as to provide a continuous covering arrangement are already known.

[0003] However, prior approaches are affected by serious problems, mainly with respect to a proper connection of the adjoining individual covering elements.

[0004] Moreover, the outer surfaces, exposed to atmospheric agents, are susceptible to be quickly and easily damaged.

SUMMARY OF THE INVENTION

[0005] Accordingly, the aim of the present invention is to overcome the above mentioned problem, by providing a modular covering element for buildings in general, which is so designed as to provide an optimum thermal insulation, in addition to having a very good dimensional stability, thereby allowing to also provide a good sealing at the interconnection regions of the plate elements forming the covering arrangement.

[0006] Within the scope of the above mentioned aim, a main object of the invention is to provide such a modular covering element which comprises an outer coating having a very high resistance against atmospheric agents, thereby preserving an integral and undamaged condition of the assembly.

[0007] Another object of the present invention is to provide such a modular covering element which comprises an outer bent-tile shaped surface, thereby providing the covering assembly with an aesthetic aspect similar to that of conventional roofs.

[0008] Yet another object of the present invention is to provide such a modular covering element which, owing to its specifically designed constructional features is very reliable and safe in operation.

[0009] 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 modular covering element for covering buildings in general, characterized in that said modular covering element comprises a bottom holding layer, on a perimeter of which are arranged a plurality of gasket strips delimiting a housing region for a foamed filling material, a contoured top plate having an outer surface coated by a coating being moreover provided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of a modular covering element for covering buildings in general, which is illustrated, by way of an indicative, but not limitative example, in the accompanying drawings, where:

Figure 1 is a schematic perspective view showing the covering modular element according to the present invention;

Figure 2 is an exploded view showing the modular covering element according to the invention;

Figure 3 is a layered cross-sectional view showing the covering modular element according to the invention;

Figure 4 is a schematic perspective view showing two adjoining modular elements, before a mutual connection thereof;

and

Figure 5 shows two modular covering elements in an adjoining and connected condition.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0011] With reference to the number references of the above mentioned figures, the modular covering element for covering buildings in general, which has been generally indicated by the reference number 1, comprises a bottom layer 2 which is advantageously made of an aluminium sheet element, which is embossed on the face or surface thereof provided to be outside arranged.

[0012] Said bottom layer can be optionally also constituted by a pre-painted galvanized sheet metal element.

[0013] At the perimetrical edge portions of said bottom layer 2, are provided a plurality of gasket or sealing strips 4 which are advantageously made of a resiliently yieldable material, which operate as holding or restraining elements for delimiting an housing region for housing therein a foamed material 6 constituting a filling and supporting element for the panel.

[0014] Said filling material, in particular, is advantageously constituted by high density foamed polyurethane, having a weight of about 35-40 kg/m^3.

[0015] Said gasket strips 4, in addition to operating as a restraining or holding element for the filling-in mass, also provide a sealing element for sealing the connection to one another of the several panels or covering elements.

[0016] A top contoured metal sheet element 10 is moreover provided, said top contoured metal sheet element having advantageously a wave configuration, thereby simulating the configuration of the bent tiles and which, at a side edge portion thereof, comprises a projecting half-wave, indicated by the reference number 10a, provided to be coupled with a corresponding half-wave arrangement of an adjoining panel or covering element.

[0017] Thus, an optimum connection of the modular panels or covering element is herein obtained.

[0018] The shaped or contoured plate is advantageously constituted by a galvanized waved metal sheet element, having a bent-tile configuration, which is coated,

on the outside thereof, by a coating layer comprising a bituminous sheath 15 to which a glass fiber reinforced polyester stiffening construction is applied, thereby providing a very good dimensional stability.

[0019] On the top of the above disclosed construction is applied an outer layer, comprising a plurality of slate flakes 20, operating as a protective element.

[0020] Thus, owing to the above disclosed arrangement, the modular element will provided an optimum thermal insulation, due to the provision of the filling-in material comprising foamed polyurethane.

[0021] Moreover, the surface of the top metal sheet element, covered by a bituminous sheath and coated by a slate flakes, provides a very high acoustical insulation in particular for rain or hail.

[0022] Moreover, the provision of the gasket strips provides a very good sealing between the several constructional elements, thereby allowing to cover, in a very safe manner, broad surfaces.

[0023] The invention, as disclosed, is susceptible to several modifications and variations, all of which will come within the scope of the invention.

[0024] Moreover, all the constructional details can be replaced by other technically equivalent elements.

[0025] In practicing the invention, the used materials, provided that they are compatible to the intended use, as well as the contingent size and shapes, can be any, depending on requirements.

Claims

1. A modular covering element for covering buildings in general, **characterized in that** said modular covering element comprises a bottom holding layer, on a perimeter of which are arranged a plurality of gasket strips delimiting a housing region for a foamed filling material, a contoured top plate having an outer surface coated by a coating being moreover provided.

2. A modular covering element, according to the preceding claim, **characterized in that** said bottom layer is constituted by an embossed aluminium sheet element.

3. A modular covering element, according to the preceding claims, **characterized in that** said bottom layer is constituted by a pre-painted galvanized sheet metal element.

4. A modular covering element, according to one or more of the preceding claims, **characterized in that** said sealing strips are made of a resilient yieldable material to provide a sealed connection of adjoining modular covering elements.

5. A modular covering element, according to one or more of the preceding claims, **characterized in that** said contoured or shaped plate comprises, at at least a side edge portion thereof, a projecting portion defining an overlapping portion with respect to an adjoining modular covering element.

6. A modular covering element, according to one or more of the preceding claims, **characterized in that** said contoured plate is constituted by an undulated or corrugated sheet metal element.

7. A modular covering element, according to one or more of the preceding claims, **characterized in that** said undulated sheet metal element comprises a projecting half-wave portion for coupling with an adjoining modular covering element.

8. A modular covering element, according to one or more of the preceding claims, **characterized in that** said filling-in foamed material is constituted by high density foamed polyurethane.

9. A modular covering element, according to one or more of the preceding claims, **characterized in that** said high density foamed polyurethane has a density of 35-40 kg/m^3.

10. A modular covering element, according to one or more of the preceding claims, **characterized in that** said coating, on an outer surface thereof, comprises a bituminous sheath, to which a glass fiber reinforced polyester stiffening construction is applied.

11. A modular covering element, according to one or more of the preceding claims, **characterized in that** said modular covering element comprises, on an outer face of said bituminous sheath, a slate flake layer.

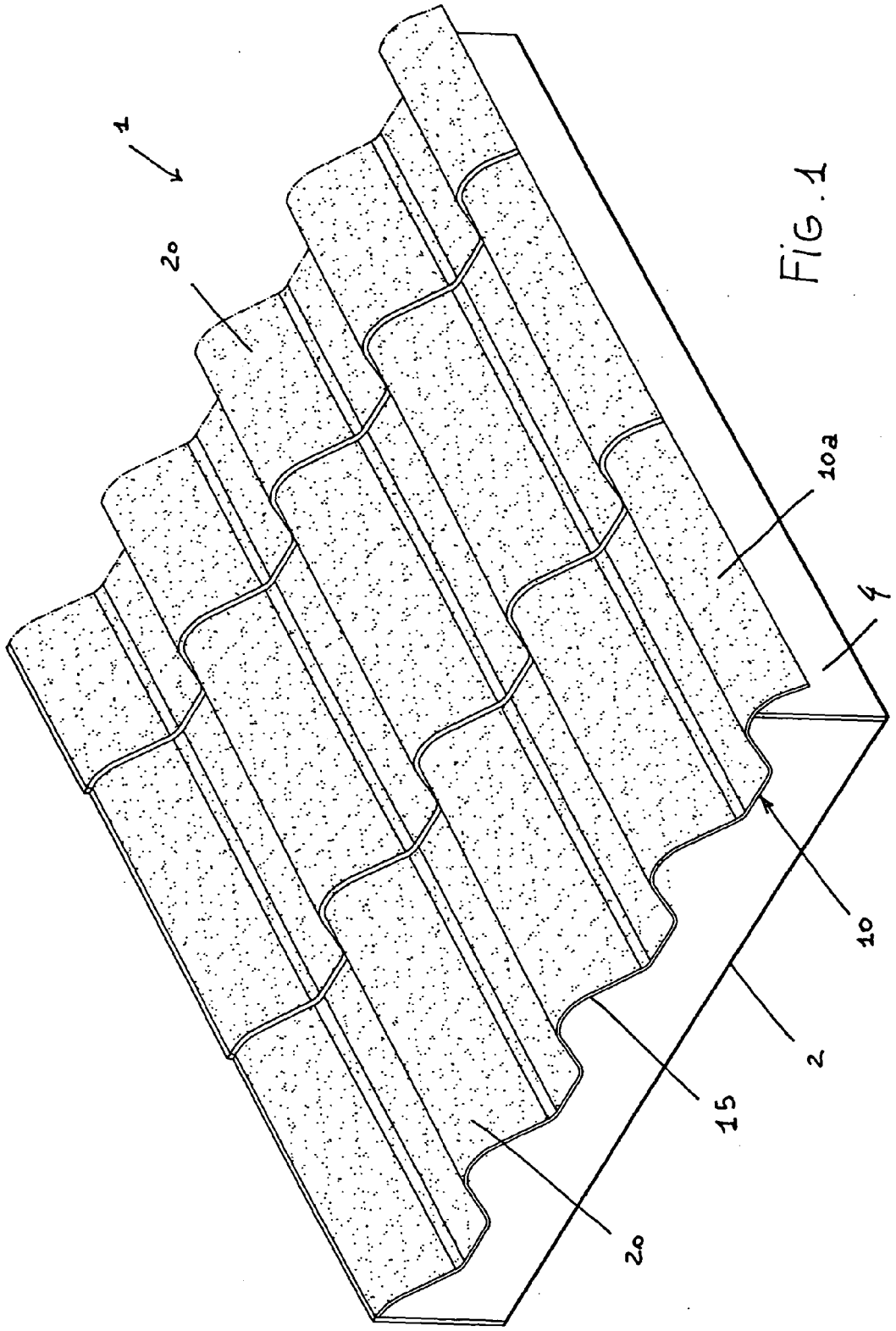

FIG. 1

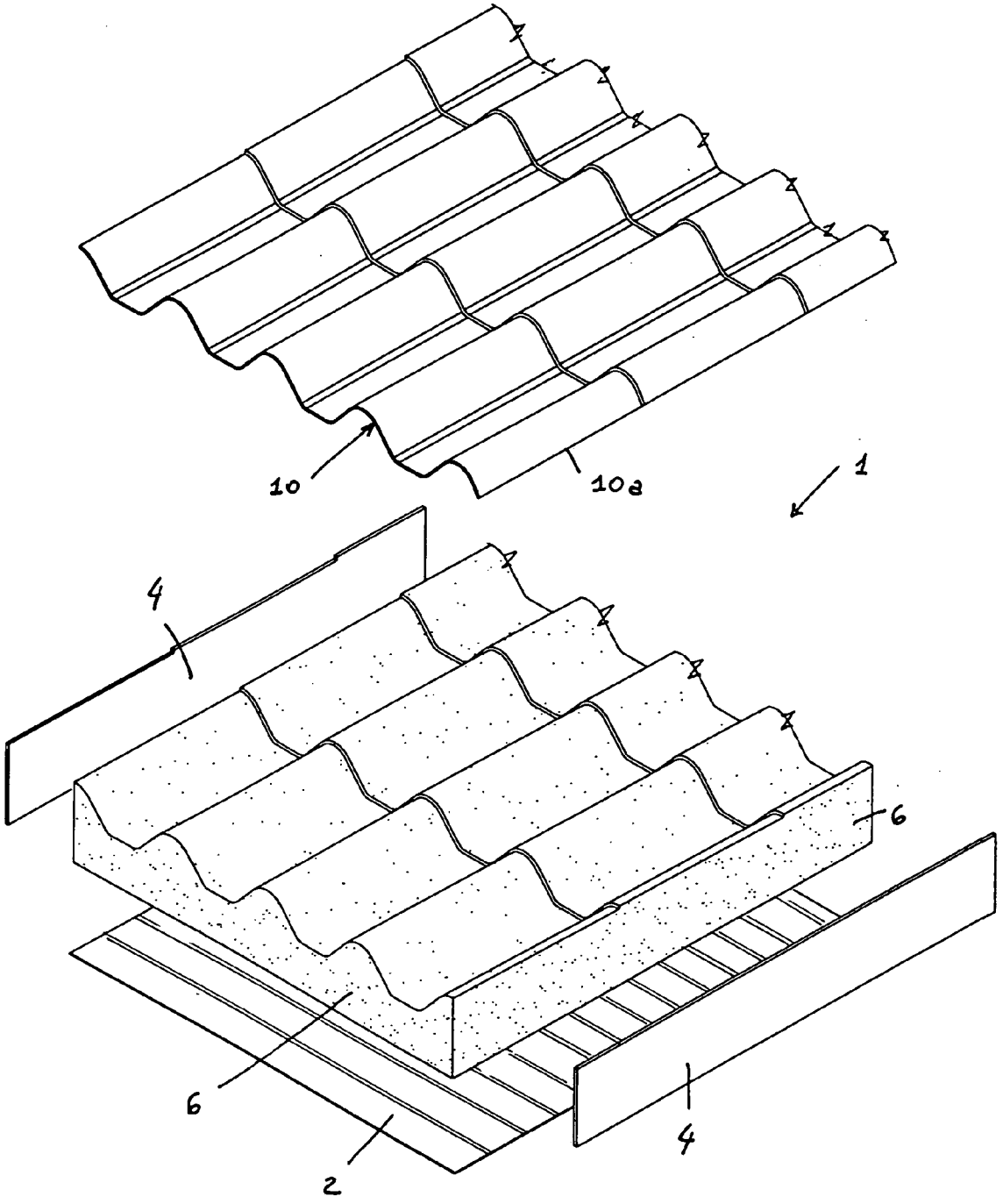

FIG. 2

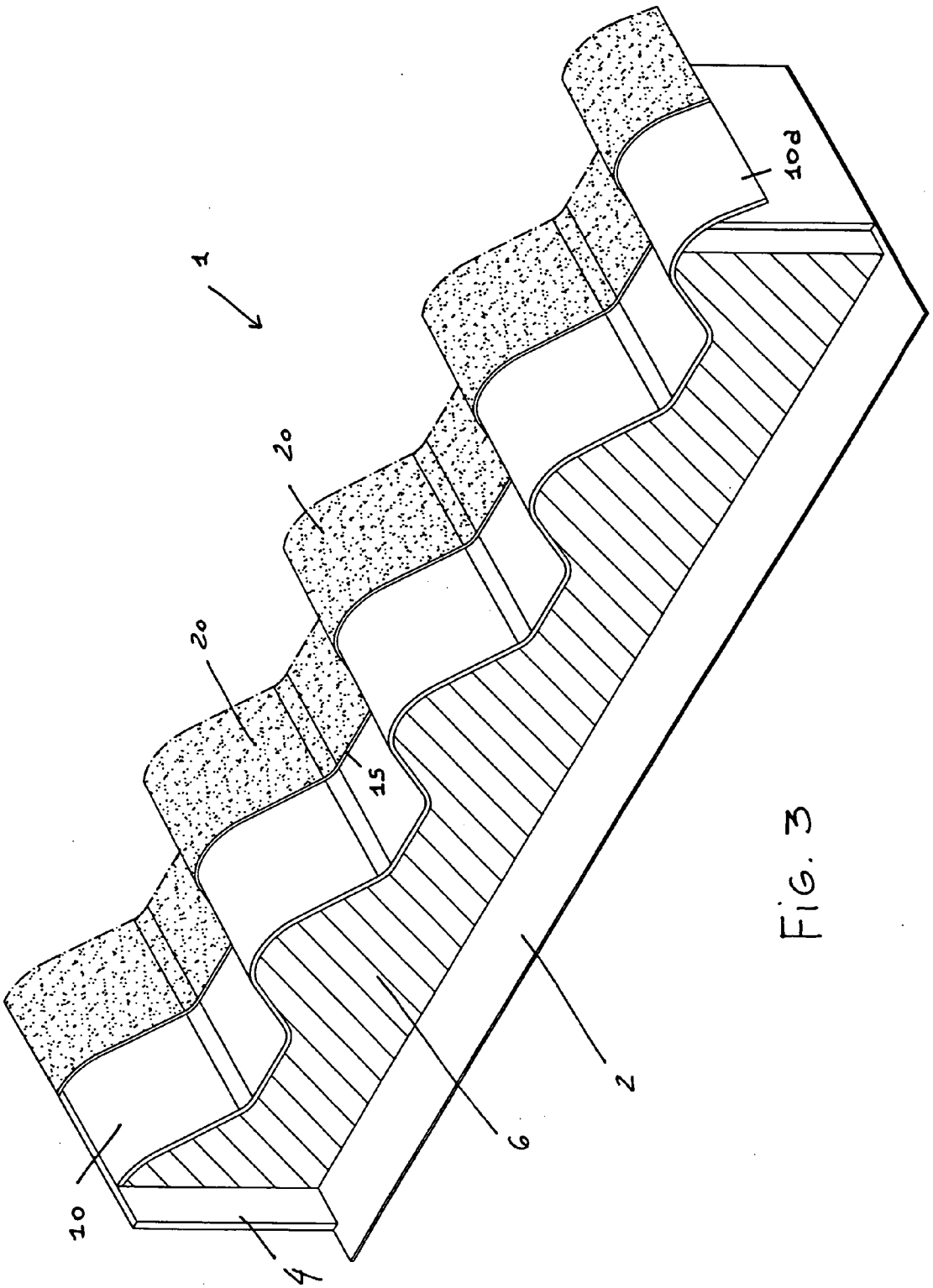

FIG. 3

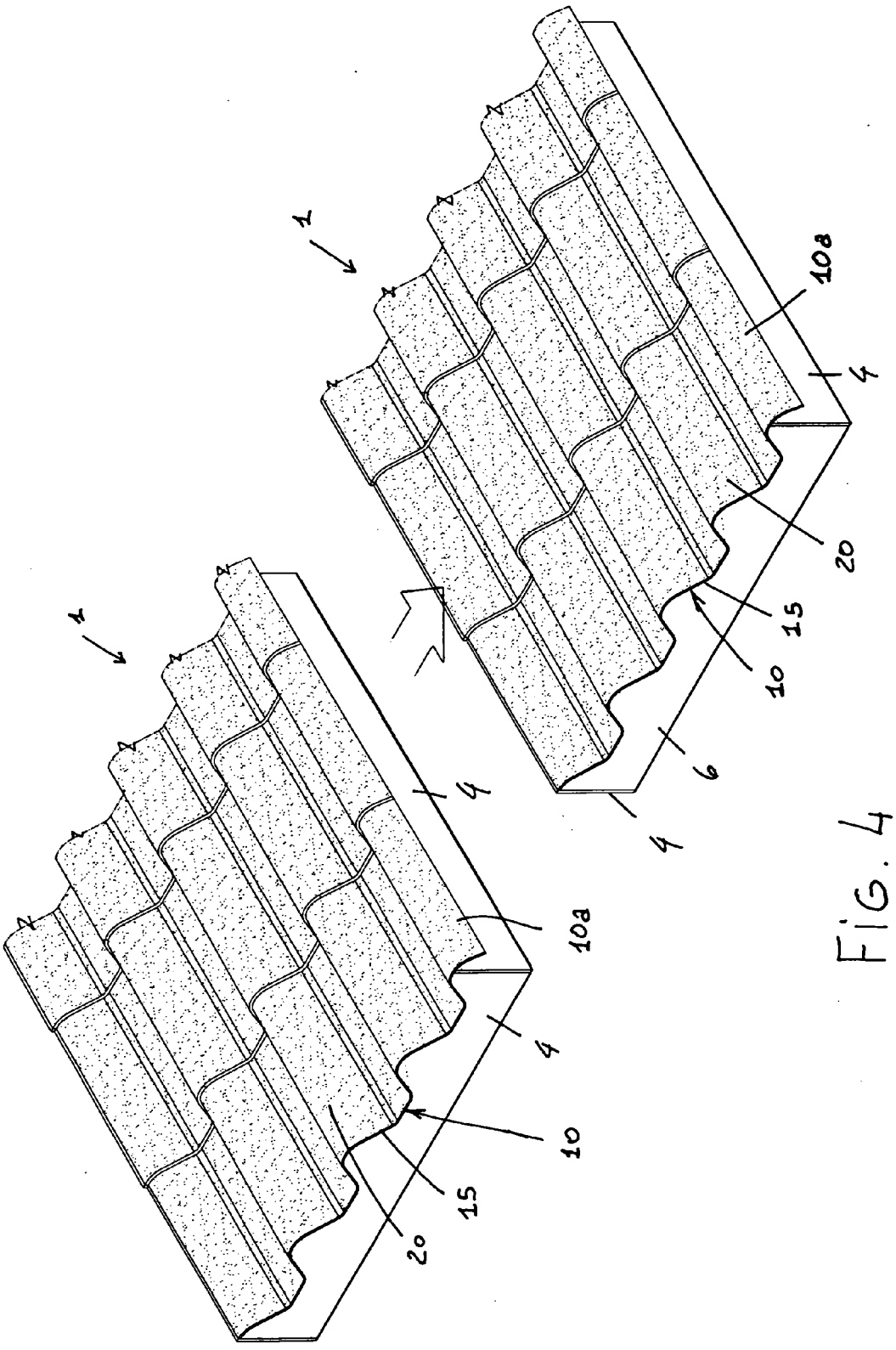

FIG. 4

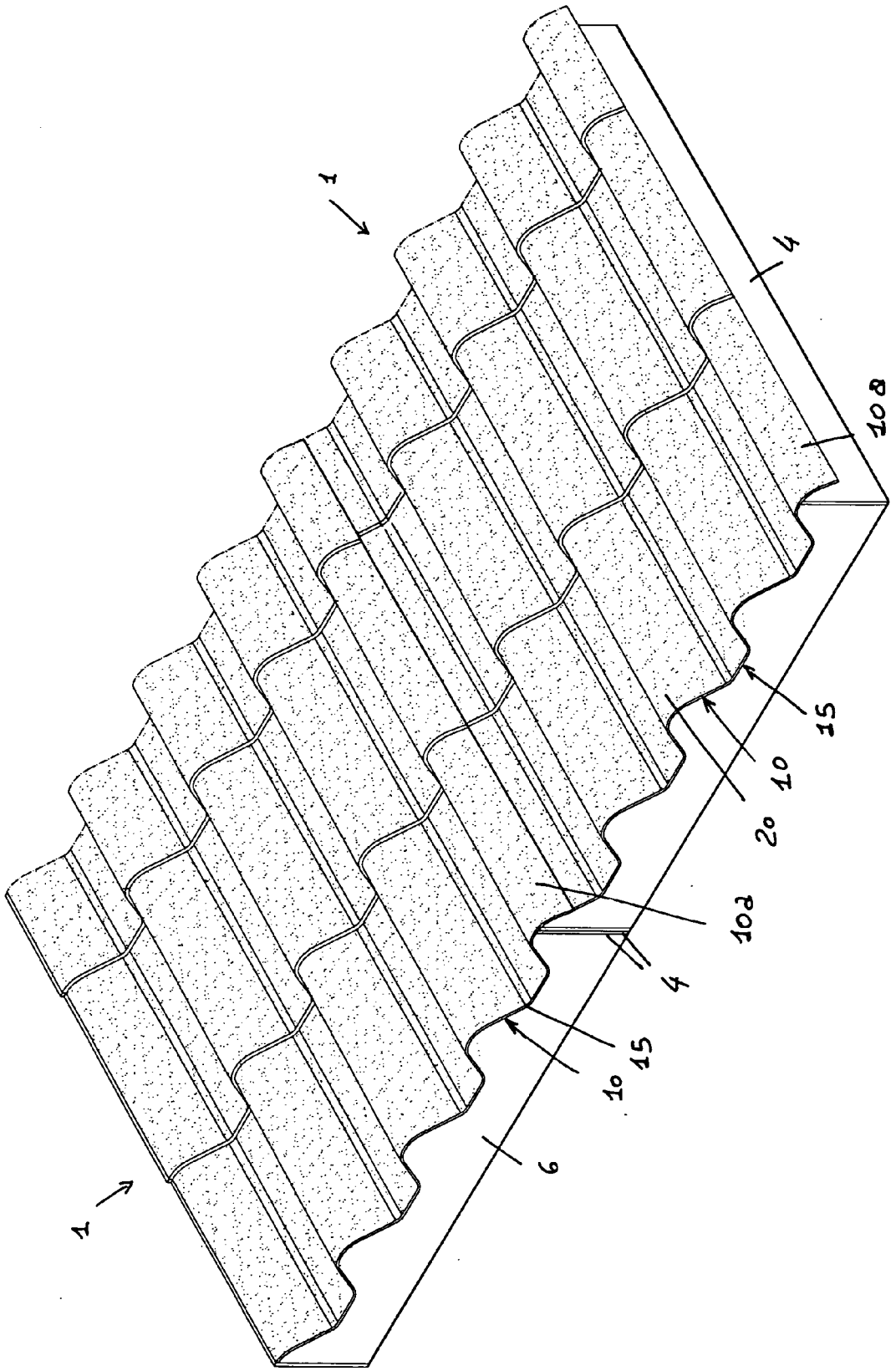

Fig. 5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 02 2193

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 967 343 A (THYSSEN KRUPP STAHL AG [DE]) 29 December 1999 (1999-12-29) * paragraphs [0009], [0013]; figures 1,3 * -----	1-9	INV. E04D3/35
X	WO 2004/104316 A (METECNO SPA [IT]; MORANDI MAURIZIO [IT]) 2 December 2004 (2004-12-02) * page 1, line 10 - line 17; figure 1 * * page 1, line 29 - page 2, line 5 * * page 4, line 3 - line 12 * -& EP 0 110 265 A (METECNO SPA [IT]) 13 June 1984 (1984-06-13) * page 9, line 15 - page 10, line 17 * -----	1-9	
X	EP 0 135 913 A (FARGO CHOU) 3 April 1985 (1985-04-03) * figure 1 * -----	1,4,6,8,9	
X	DE 24 11 956 A1 (KLEIN BRETELER HENDRIKUS HERMA) 7 August 1975 (1975-08-07)	1,4-9	TECHNICAL FIELDS SEARCHED (IPC)
A	* claim 3; figure 1 * -----	11	E04D
A	GB 957 091 A (PATENT & LICENSING CORP) 6 May 1964 (1964-05-06) * page 1, line 12 - line 17 * * page 1, line 54 - line 63 * * page 2, line 25 - line 33 * * page 2, line 55 - line 59 * -----	10	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	22 February 2008	Demeester, Jan

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 02 2193

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-02-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0967343 A	29-12-1999	CZ 9901948 A3	15-12-1999
		DE 19824597 C1	24-02-2000
		HR 990155 A2	30-04-2000
		PL 333167 A1	06-12-1999
		SK 72499 A3	14-02-2000
WO 2004104316 A	02-12-2004	AU 2003234077 A1	13-12-2004
		DE 60308423 T2	16-05-2007
EP 0110265 A	13-06-1984	IT 1154367 B	21-01-1987
EP 0135913 A	03-04-1985	AU 3330684 A	28-03-1985
		BE 900619 A1	16-01-1985
		DK 443384 A	20-03-1985
		EG 16331 A	30-12-1986
		GB 2146681 A	24-04-1985
		ZA 8407314 A	24-04-1985
DE 2411956 A1	07-08-1975	NL 7400996 A	28-07-1975
GB 957091 A	06-05-1964	CH 387264 A	31-01-1965
		DE 1434164 A1	24-10-1968

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82