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(54) External insulating cladding for building facings or roofs

(57) Cladding for buildings in two treated cold-rolled steel sheets (1,3), with single or double tongue and groove joints, and hidden fastening, polyurethane has been injected between the sheets. The panels are fixed to the facing or roof by means of screw-fastened clips with at least two screws (5). The sheets are treated on the underside with a layer of galvanizing, phosphating and primer for polyurethane and on their topside with a layer of galvanizing, phosphating, primer and finally a finishing coat.

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Description

OBJECT OF THE INVENTION

[0001] The present invention refers to a cladding for buildings, both facings and roofs, insulating, which can be used in all types of building.

[0002] The cladding is characterised in comprising two treated cold-rolled steel plates, between which a polyurethane layer is present.

[0003] Additionally the invention is characterised in a tongue and groove finish wherein the tongues are protected.

BACKGROUND OF THE INVENTION

[0004] Different panels are known with a metallic enclosing outer layer which houses polyurethane foam with an insulating function in their interior, such as the European patent with application number E92100970, "Cladding of facings of buildings or similar" comprising an infrastructure of channelled rails and lining panels fixed thereon.

[0005] The use of this type of panel is widespread, in which the outer layer is of a type of steel which oxidizes, a layer of external oxidation being formed which is what protects the panel from atmospheric corrosion.

DESCRIPTION OF THE INVENTION

[0006] The present invention consists of an insulating cladding for facings or roofs.

[0007] The cladding consists of two treated cold-rolled steel sheets, between which polyurethane has been injected. The panels are fixed to the facing or roof by means of screwed fastening clips.

[0008] The metal plates are treated on their underside with a layer of galvanizing, phosphating and primer for polyurethane and on the topside with a layer of galvanizing, phosphating, primer and finally a finishing coat.

[0009] The joint between panels is of simple or double tongue and groove, and hidden fastening.

[0010] Assembly is carried out by sliding between panels in a coplanar direction, since they have tongue and groove finishes on the edges of two opposing sides. The tongues are protected.

[0011] A closed cavity is configured inside the joint.

[0012] The water-tightness between panels is implemented by means of sealing between tongue and groove joints, and by means of a seal in tenon form which is inserted between the joints of the consecutive panels.

DESCRIPTION OF THE DRAWINGS

[0013] The present descriptive specification is completed with a set of drawings, which illustrate the preferred embodiment of the invention in a non-restrictive manner.

[0014] Figure 1 shows a section of the layers of treatment of the panels of the invention.

[0015] Figure 2 shows a section of the insertion ends of two panels for roofing.

[0016] Figure 3 shows a section of the insertion ends of two panels for vertical facing.

[0017] Figure 4 shows a section of the insertion ends of two panels for horizontal facing.

[0018] Figure 5 shows a view in perspective of the fastening clip for roofing.

[0019] Figure 6 shows a detail of the section of the joint in tenon form.

DETAILED EXPLANATION OF MODES OF EMBODIMENT

FIRST EXAMPLE OF EMBODIMENT: PANEL FOR ROOFING

[0020] In the light of the foregoing, the present invention consists of a roofing panel which is constituted by a layered assembly consisting of an outer sheet (1), a polyurethane outer insulating panel (2), and an inner sheet (3), the panel having ends for tongue and groove joints.

[0021] Both the outer sheet (1) and the inner (3) are made of treated cold-rolled steel.

[0022] In figure 1 the layers are shown of the different treatments which the cold-rolled steel receives.

[0023] Both the cold-rolled steel layer (1.1) which forms the outer sheet (1), and the cold-rolled steel layer (3.1) which forms the inner sheet (3) have a number of treatment layers. On the face nearest the polyurethane they have a layer (1.2, 3.2) of galvanizing, one of phosphating (1.3, 3.3) and a coat (1.4, 3.4) of primer for polyurethane, on the face opposite there is a layer of galvanizing (1.5, 3.5), a layer of phosphating (1.6, 3.6), a coat of primer (1.7, 3.7) and a finishing coat (1.8, 3.8).

[0024] The panels have double asymmetric tongue and groove joints.

[0025] The panels are joined to the roof by means of clips (4) with a U-section with an open wing (4.1) and the other wing (4.2) in form of a hook, which are fastened thereto by means of screws (5).

[0026] The clip (4) is coupled to the inner sheet (3) by the male projection (6) of the sheet which covers the open wing (4.1) of the clip (4) externally, it is also coupled to the outer sheet (1) by covering with the opposing wing (4.2) in hook form the bend (7) on the end of the outer sheet (1).

[0027] The assembly between panels is carried out by means of sliding, since they have tongue and groove finishes on the edges of two opposing sides, the male projection (8) of the outer sheet (1) and the male projection (6) of the inner sheet (3) are protected by being internal.

[0028] The outer sheet (1) has a drainage channel (9)

for running off the water in the event of rain, directing it toward the general drainage gutter.

[0029] The water-tightness of the panels is guaranteed by means of sealed joints (10), and specifically a rubber joint (11) in tenon form assures the water-tightness between consecutive panels on the outermost part thereof.

SECOND EXAMPLE OF EMBODIMENT: VERTICAL PANEL FOR FACINGS

[0030] The vertical panel has a double tongue and groove joint with central symmetry between panels.

[0031] The clip (12) which joins the assembly to the facing is C-shaped.

[0032] This clip (12) rests on one side on the shoulder (13) of the tongue and groove joint of the inner sheet (14) in a double curved form and, on the other, on the back-folded termination (15) of the waved tongue and groove joint of the outer sheet (16).

[0033] The panels are sealed (17) to assure the water-tightness of the assembly.

[0034] The male projection (18) of the outer sheet (16) and the male projection (19) of the inner sheet (14) are protected by being internal.

THIRD EXAMPLE OF EMBODIMENT: HORIZONTAL PANEL FOR FACINGS

[0035] The horizontal panel has a single and asymmetric tongue and groove joint.

[0036] It is screwed to the assembly by means of two superimposed clips (20,21) which are screwed on the back-folded end (22) of the L-shaped termination of the outer sheet (23) of the horizontal panel.

[0037] The opposing end (24) of the outer sheet (23) of the horizontal panel is wave-shaped.

[0038] The clip (20) in contact with the sheet (23) has a C-shape and the second (21) clip above this directs its end (21.1) toward the interior of the male projection (25) of the inner sheet (26).

[0039] Between the tongue and groove joint, a rubber seal (27) is shown to provide water-tightness to the assembly.

[0040] The essential nature of this invention is not altered by variations in materials, form, size and arrangement of the component elements, described in a non-restrictive manner, sufficient for an expert to proceed to the reproduction thereof.

Claims

1. Cladding for buildings **characterised in that** a layered assembly is constituted consisting of an outer sheet, an insulating panel, and an inner sheet, the material of the outer and inner sheet is cold-rolled steel which has a number of layers of treatment, on the face nearest to the polyurethane they have a layer of galvanizing, one of phosphating and a coat of primer for polyurethane, on the opposing face there is a layer of galvanizing, a phosphating layer, a coat of primer and a finishing coat, the cladding is secured to the building by means of screw-fastened clips, both sheets are finished in tongue and groove joints on the edges of two opposing sides, wherein the male projections are protected and on the inside of the joint a closed cavity is configured, the configuration of the tongue and groove joint allows assembling with the entrance in a coplanar direction.

2. Cladding for buildings according to claim 1 **characterised in that** a joint (11) in tenon form is placed between the joints of the consecutive panels.

3. Cladding for buildings according to claim 1 **characterised in that** the panels come with double and asymmetric tongue and groove joints and they are coupled to the assembly by means of screwed clips (4),where the clip (4) has a U-section with one wing (4.1) open outwardly and the other one (4.2) opposite in hook form, the union of the clip (4) with the inner sheet (3) is implemented by means of the male projection (6) of the sheet (3) which covers the open wing (4.1) of the clip (4), the outer sheet (1) is held with the wing (4.2) in hook form to the end bend (7) of the outer sheet (1); both the male projection (8) of the outer sheet (1) and the male projection (6) of the inner sheet (3) are protected by being internal, and the outer sheet (1) shows a channel (9) for drainage.

4. Cladding for buildings according to claim 1 **characterised in that** it has a double tongue and groove joint with central symmetry between panels, and it has a C-shaped clip (12), where this clip (12) rests on one side on the shoulder (13) of the tongue and groove joint of the inner sheet (14) in double curved form, and on the other side on the bent-back termination (15) of the waved tongue and groove end of the outer sheet (16); the male projection (18) of the outer sheet (16) and the male projection (19) of the inner sheet (14) are protected.

5. Cladding for buildings according to claim one **characterised in that** it has a joint between panels which is a single and asymmetric tongue and groove joint, and they are joined to the assembly by means of some superimposed clips (20,21) which are screwed on the bent-back end (22) of the L-shaped termination of the outer sheet (21); the clip (20) in contact with the sheet (23) is C-shaped and the second (21) clip directs its end (21.1) toward the interior of the male projection (25).

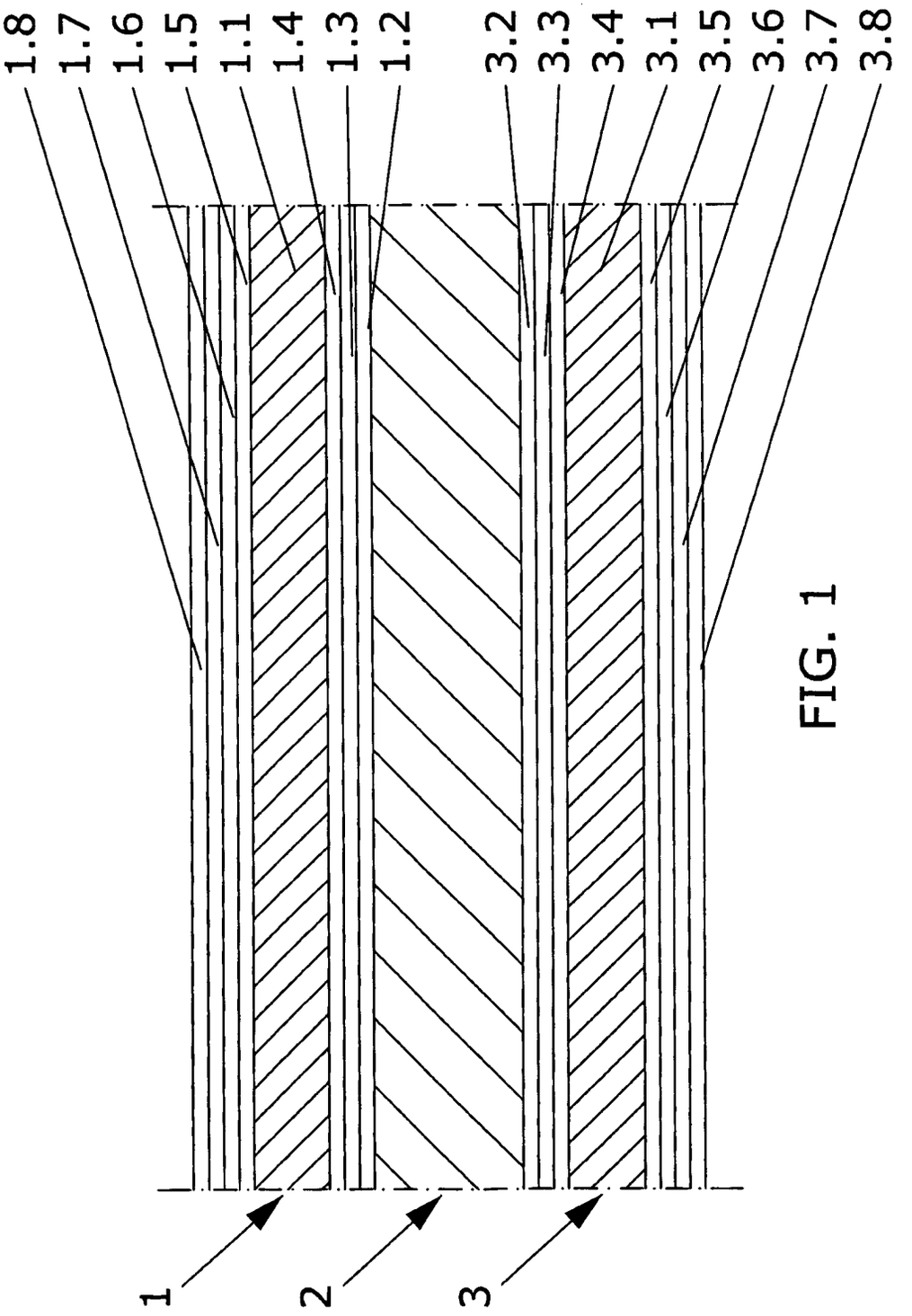


FIG. 1

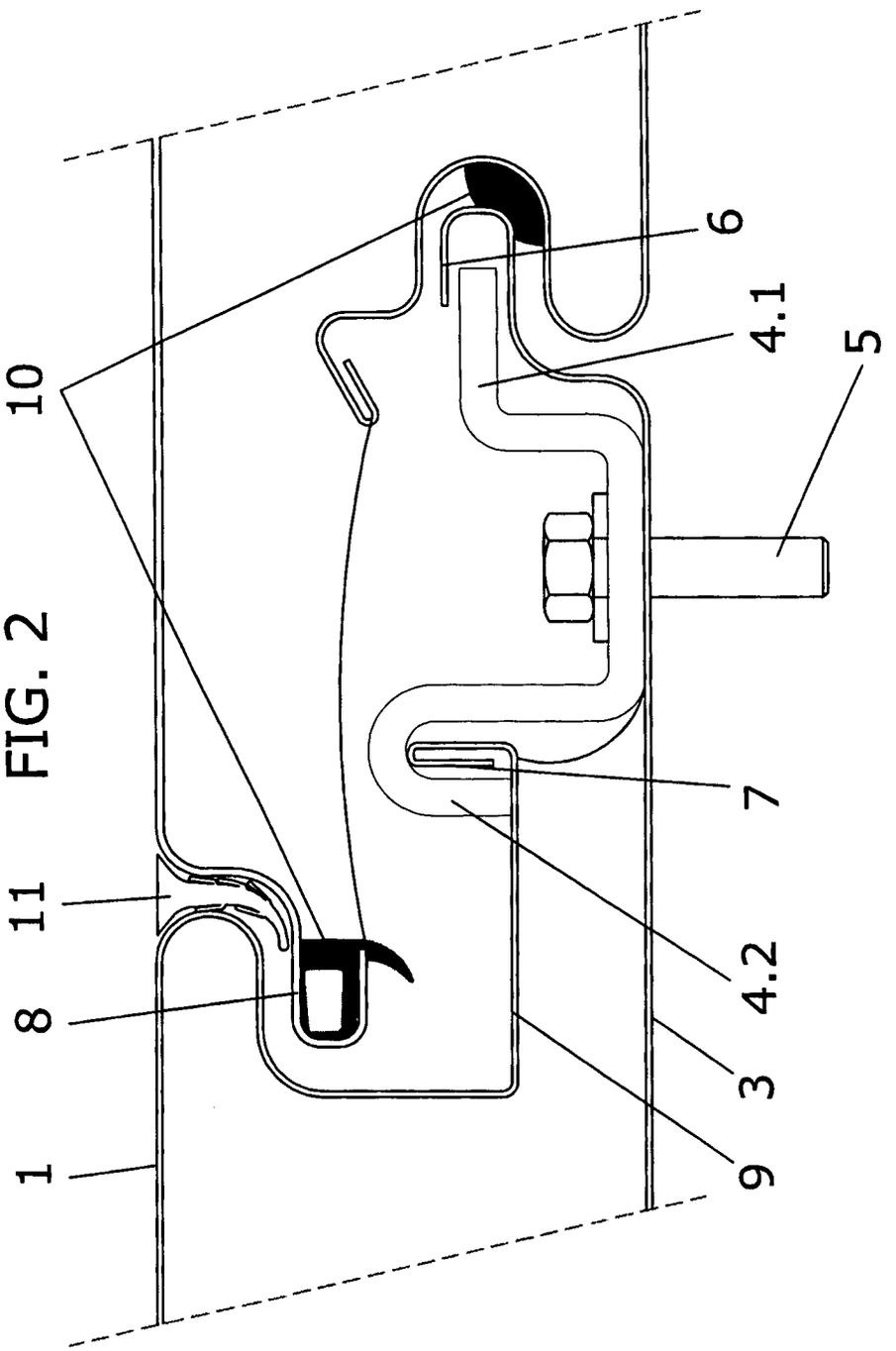
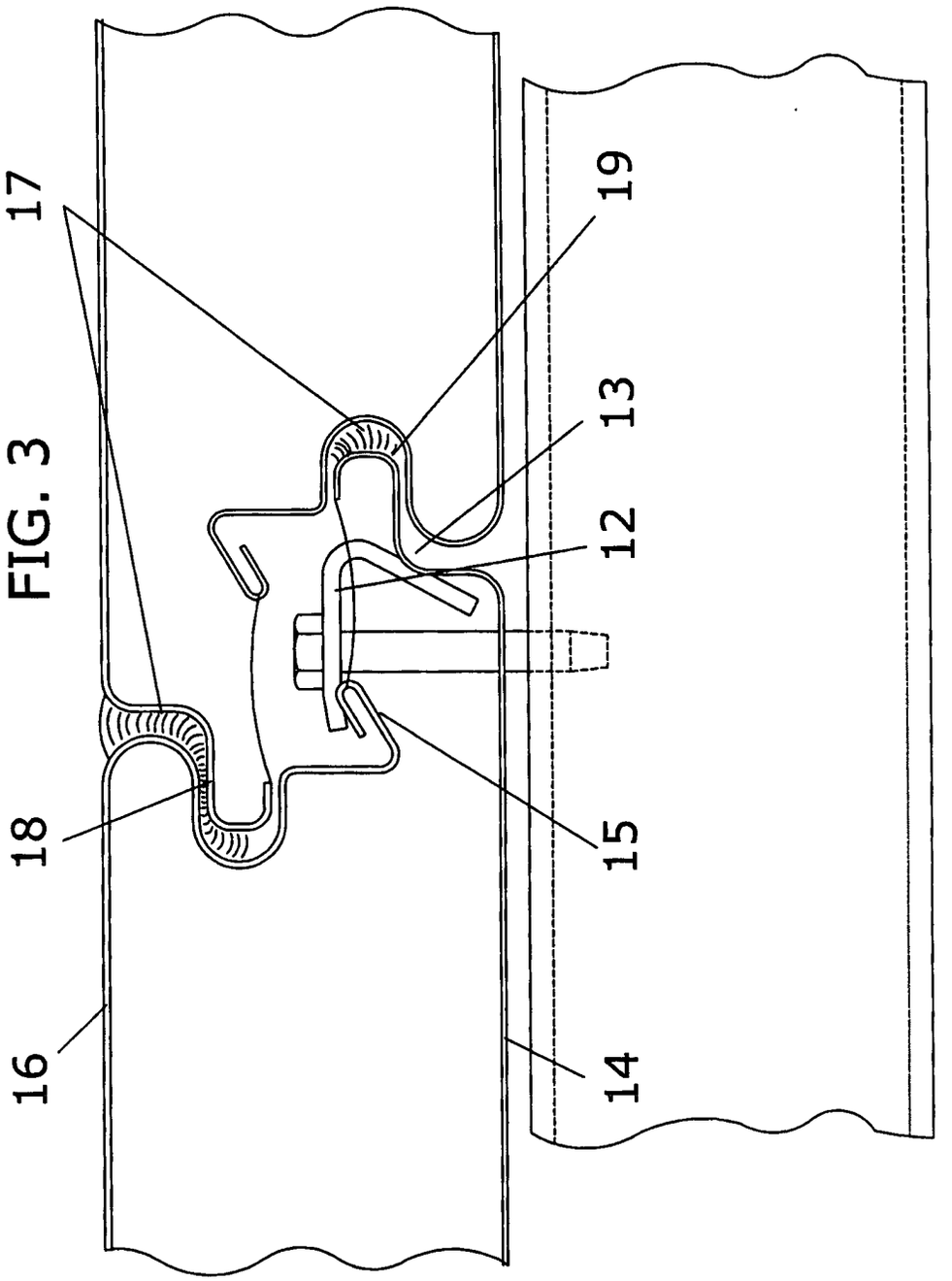


FIG. 2

FIG. 3



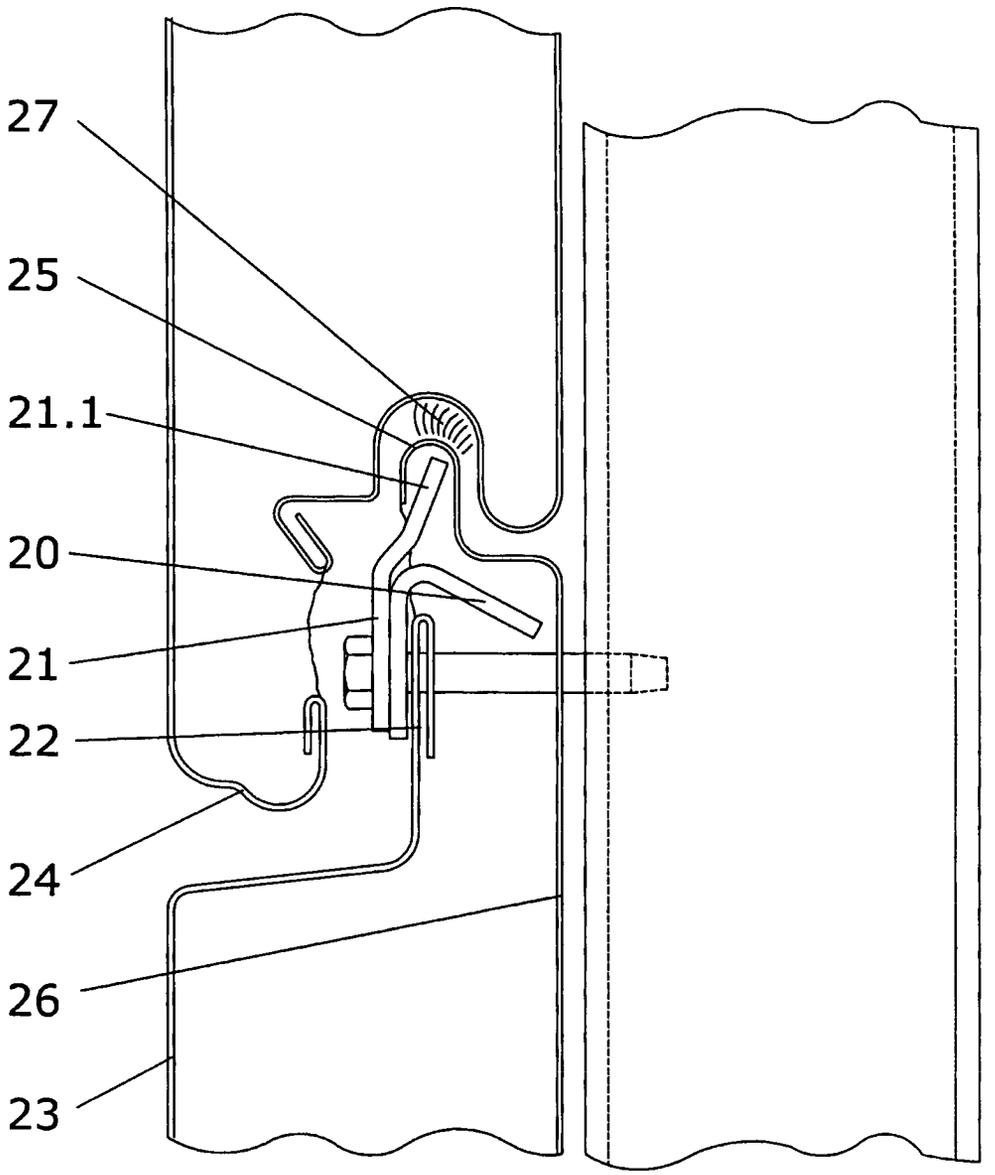


FIG. 4

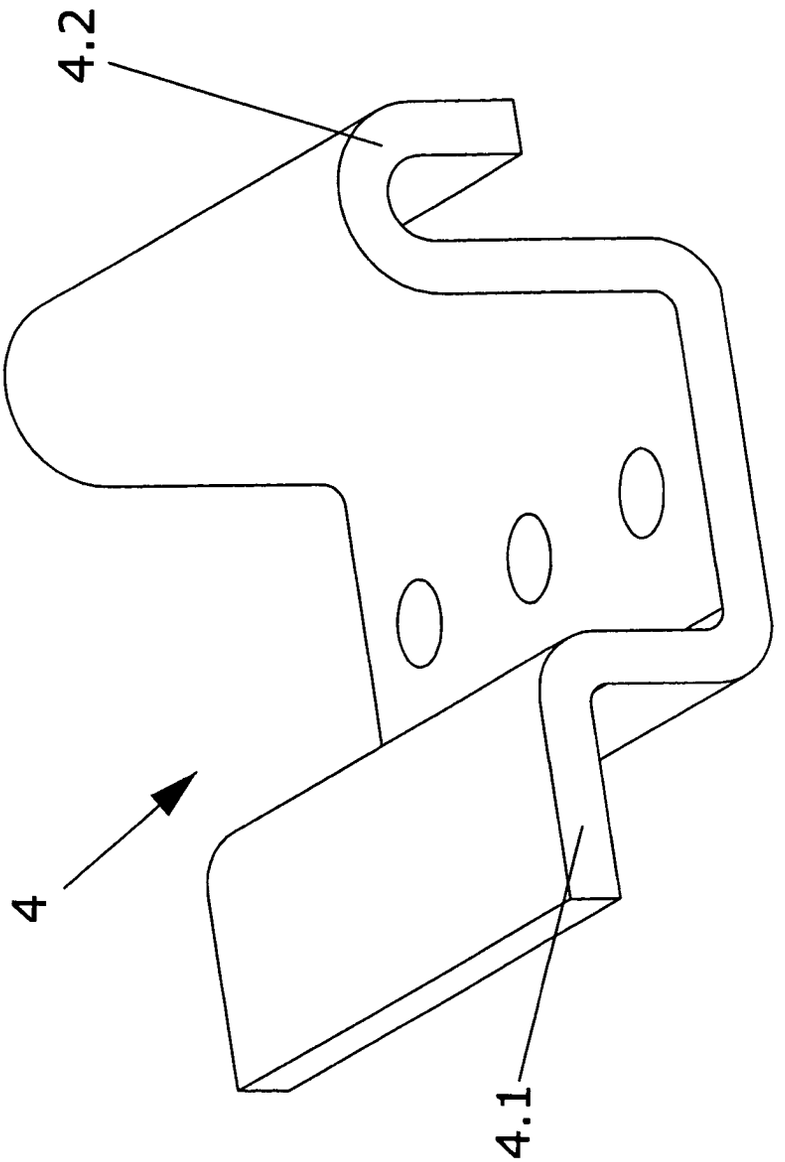


FIG. 5

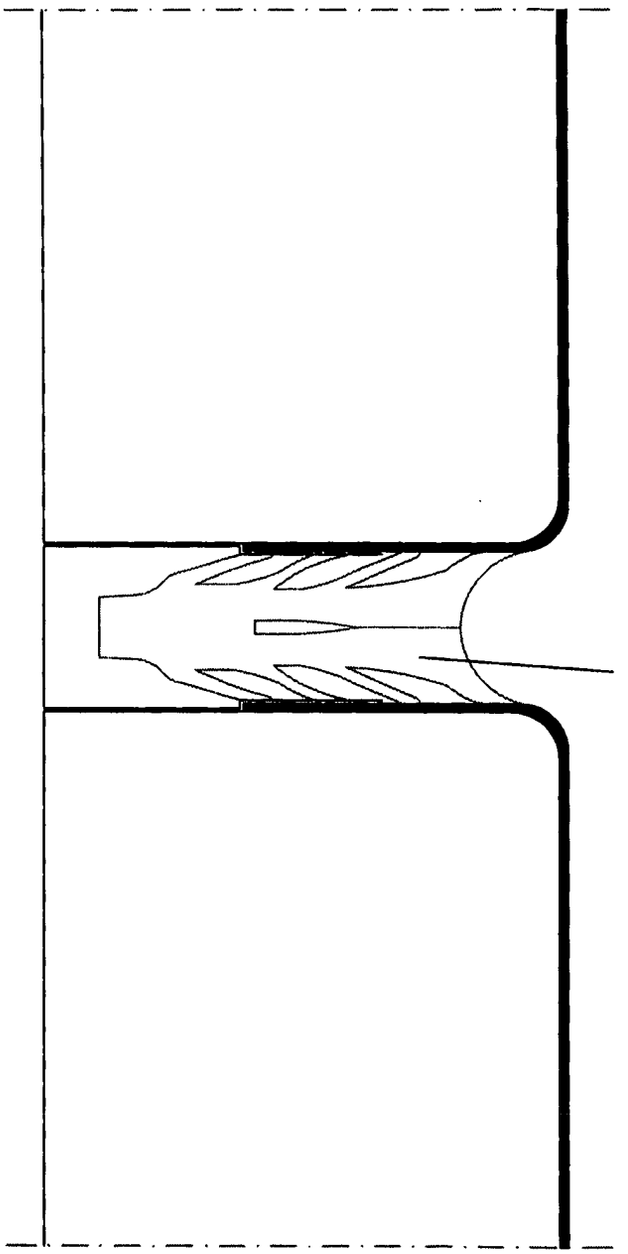


FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 04 38 1039

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.7)
Y	EP 0 522 992 A1 (ROBERTSON ESPANOLA, S.A) 13 January 1993 (1993-01-13) * column 4, line 19 - column 6, line 22 * -----	1-3	E04F13/12 E04F13/08 E04D3/35 E04D3/38
Y	EP 0 980 937 A2 (H.H. ROBERTSON LIMITED) 23 February 2000 (2000-02-23) * paragraphs [0001], [0002], [0006], [0011], [0017] * -----	1-3,5	E04C2/292 C23C28/00
A	US 3 891 471 A (SUMMERS ET AL) 24 June 1975 (1975-06-24) * column 2, line 10 - line 15 * -----	1	
A	EP 1 253 218 A1 (NIPPON STEEL CORPORATION) 30 October 2002 (2002-10-30) * paragraphs [0001], [0002] * -----	1	
A	WO 99/00559 A1 (ALTENBERG, MILTON, J) 7 January 1999 (1999-01-07) * page 1 * * page 3 - page 4 * * page 11 * * figures * -----	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) E04F E04D E04C C23C
Y	EP 1 260 647 A1 (THYSSENKRUPP STAHL AG) 27 November 2002 (2002-11-27) * paragraphs [0001], [0007], [0012] * -----	2	
A	FR 2 716 690 A1 (VILLAIN SA) 1 September 1995 (1995-09-01) * page 3, column 17 - page 4, column 5 * * figure 2 * -----	2	
	-/--		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 January 2005	Bouyssy, V

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Application Number
EP 04 38 1039

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.7)
Y	WO 00/31357 A1 (CENTRIA) 2 June 2000 (2000-06-02) * page 11 - page 12 * * page 23 * * page 28 * * figures 4,11,13 *	5	
A	US 4 123 885 A (SCOTT ET AL) 7 November 1978 (1978-11-07) * column 1, line 63 - column 3, line 48 * * figure 1 *	1,4	
A	US 4 184 301 A (ANDERSON, JOHN W ET AL) 22 January 1980 (1980-01-22) * column 2, line 45 - column 4, line 15 * * figures *	1	
D,A	EP 0 520 132 A1 (LOTHAR STOMMEL FASSADENBAU GMBH) 30 December 1992 (1992-12-30) * column 2 - column 4 * * figures *		TECHNICAL FIELDS SEARCHED (Int.Cl.7)

The present search report has been drawn up for all claims

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 38 1039

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25-01-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0522992 A1	13-01-1993	ES 2037593 A1	16-06-1993
		ES 2052441 A2	01-07-1994
		AT 137291 T	15-05-1996
		AU 647298 B2	17-03-1994
		AU 1960592 A	14-01-1993
		CA 2073301 A1	13-01-1993
		DE 69210121 D1	30-05-1996
		NZ 243524 A	26-09-1995
		US 5277011 A	11-01-1994
EP 0980937 A2	23-02-2000	AT 195781 T	15-09-2000
		AU 7316796 A	15-05-1997
		DE 69609981 D1	28-09-2000
		DE 69609981 T2	01-03-2001
		EP 0857244 A1	12-08-1998
		ES 2152046 T3	16-01-2001
		GB 2341619 A	22-03-2000
		WO 9715736 A1	01-05-1997
		GB 2321482 A ,B	29-07-1998
US 3891471 A	24-06-1975	AU 476311 B2	16-09-1976
		AU 5417773 A	10-10-1974
		BE 798840 A1	16-08-1973
		CA 994617 A1	10-08-1976
		DE 2321779 A1	15-11-1973
		ES 414124 A1	01-07-1976
		FR 2182987 A1	14-12-1973
		GB 1402941 A	13-08-1975
		IE 37567 B1	17-08-1977
		IT 989627 B	10-06-1975
		JP 49041236 A	18-04-1974
		NL 7305965 A	05-11-1973
		SE 398052 B	05-12-1977
		ZA 7302898 A	24-04-1974
EP 1253218 A1	30-10-2002	JP 2001131763 A	15-05-2001
		AU 771501 B2	25-03-2004
		AU 1302901 A	06-06-2001
		CA 2389033 A1	17-05-2001
		US 6720078 B1	13-04-2004
		WO 0134873 A1	17-05-2001
WO 9900559 A1	07-01-1999	EP 0990079 A1	05-04-2000
		JP 2002507261 T	05-03-2002
		US 6096416 A	01-08-2000

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 38 1039

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The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-01-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1260647 A1	27-11-2002	DE 20108555 U1	16-08-2001
FR 2716690 A1	01-09-1995	NONE	
WO 0031357 A1	02-06-2000	US 6253511 B1	03-07-2001
		AU 6407799 A	13-06-2000
		CA 2351846 A1	02-06-2000
		EP 1131509 A1	12-09-2001
		US 6627128 B1	30-09-2003
		US 2001009085 A1	26-07-2001
		US 2001004816 A1	28-06-2001
US 4123885 A	07-11-1978	CA 1054769 A1	22-05-1979
US 4184301 A	22-01-1980	ES 230785 Y	16-03-1978
		CA 1080934 A1	08-07-1980
		DE 2837195 A1	01-03-1979
		FR 2401281 A1	23-03-1979
EP 0520132 A1	30-12-1992	DE 9107888 U1	19-09-1991
		AT 105902 T	15-06-1994
		CA 2072413 A1	28-12-1992
		DE 59200171 D1	23-06-1994
		US 5220758 A	22-06-1993

EPO FORM P0459

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