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(54) **DEFORMABLE PROFILED ELEMENT**

(57) A deformable profiled element (10), having a longitudinal extension and a C-shaped transverse cross-section, the profiled element (10) comprising:
- two parallel wings (11a, 11b), respectively a first wing (11a) and a second wing (11b),
- a core (12), interposed and comprised between the two wings (11a, 11b) and arranged on a plane that is perpendicular to the planes of arrangement of the two wings (11a, 11b).

The profiled element (10) has a plurality of preweakenings (14) for bending toward the internal surface (15) of the core (12) and toward the external surface (16) of the core (12).

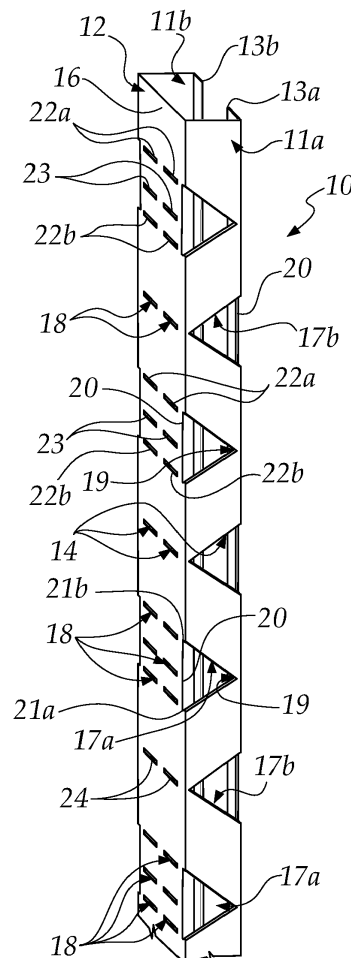


Fig.1

Description

[0001] The present invention relates to a deformable profiled element.

[0002] The invention is used in the building field, in the sector of constructions with prefabricated panels.

[0003] Currently, in order to provide partition structures inside a building, such as for example walls and/or false ceilings, prefabricated panels, such as those made of plasterboard, are widely used.

[0004] In order to provide a partition structure by means of prefabricated panels, usually the supporting frame of the partition structure is prepared by means of metallic and/or wood supports and/or profiled elements, which are in turn fixed to elements of the building, such as wall elements and/or the floor and/or ceiling.

[0005] Once the frame of the partition structure has been provided, the prefabricated panels are fixed to the supports and/or profiled elements that compose it.

[0006] These structures are easy and quick to provide and allow to obtain ceilings and walls with shapes that are difficult to provide with ordinary clay building components and concrete, such as for example curvilinear contours of walls or ceilings.

[0007] In order to obtain partitions with curvilinear shapes, metallic profiled elements are used which can be deformed as required.

[0008] Such metallic profiled elements generally have a C-shaped cross-section with a plurality of bending preweakening regions, substantially constituted by openings and/or cuts, on the core of the C-shape and on its wings.

[0009] Such openings and/or cuts weaken the structure of the profiled element and it is therefore possible to deform it easily in order to provide bends.

[0010] During the preparation of the frame of the partition structure, the profiled element is in fact bent by acting on one or more of these bending preweakening regions.

[0011] Some of these profiled elements can, if necessary, be used also as sliding guide for in-wall sliding doors.

[0012] This known technique has some drawbacks.

[0013] In general, said deformable profiled elements can be deformed and therefore bent only in one direction.

[0014] In practice, two types of different profiled element are provided and used depending on whether it is necessary to bend the profiled element with a concavity directed toward the internal surface of the core of the profiled element or toward the external surface of the core of the profiled element.

[0015] The expression "internal surface of the core of the profiled element" means, in the present description, the surface of the core of the profiled element directed toward its wings.

[0016] The expression "external surface of the core of the profiled element" means, in the present description, the surface of the core of the profiled element directed

opposite with respect to the internal surface.

[0017] This leads to the drawback, for the installation technician, of having to know in advance which profiled element he will need during the installation of the partition structure and/or to the need to have and bring with him the two types of profiled element.

[0018] Furthermore, the installation technician must have in stock both types of profiled element, with consequent considerable space occupations deriving from them and with the occupation of a considerable amount of warehouse volume.

[0019] The aim of the present invention is to provide a deformable profiled element that is capable of improving the background art in one or more of the aspects mentioned above.

[0020] Within this aim, an object of the invention is to provide a deformable profiled element that can be bent both with the concavity directed toward the internal surface of the core of the profiled element and with the concavity directed toward the external surface of the core of the profiled element.

[0021] Another object of the invention is to provide a deformable profiled element for which the installation technician does not need to know beforehand which type of bending he must give it during the installation of the partition structure.

[0022] A further object of the invention is to provide a deformable profiled element that allows the installation technician to reduce the space occupation and the warehouse volume with respect to similar profiled elements of the known type.

[0023] A still further object of the present invention is to overcome the drawbacks of the background art in a manner that is alternative to any existing solutions.

[0024] Not least object of the invention is to provide a deformable profiled element that is highly reliable, relatively easy to provide and at competitive costs.

[0025] This aim and these and other objects which will become better apparent hereinafter are achieved by a deformable profiled element having a longitudinal extension and a C-shaped transverse cross-section, said profiled element comprising:

- two parallel wings, respectively a first wing and a second wing,
- a core, interposed and comprised between said two wings and arranged on a plane that is perpendicular to the planes of arrangement of said two wings,

said profiled element being characterized in that it has a plurality of preweakenings for bending toward the internal surface of said core and toward the external surface of said core.

[0026] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment, of the deformable profiled element according to the invention, illustrated by way of non-limiting example in the accom-

panying drawings, wherein:

Figure 1 is a first partial, perspective, view of a profiled element according to the invention;

Figure 2 is a second partial perspective view of the profiled element of Figure 1;

Figure 3 is a side view of a first example of application of the profiled element of Figure 1;

Figure 4 is a side view of a second example of application of the profiled element of Figure 1.

[0027] With reference to the figures, a deformable profiled element according to the invention is generally designated by the reference numeral 10.

[0028] The profiled element 10 has a longitudinal extension with a C-shaped transverse cross-section.

[0029] In the present description, the expression "transverse cross-section" means the cross-section on the plane that is perpendicular to the axis of longitudinal extension of the profiled element 10.

[0030] The profiled element 10 is made of sheet metal.

[0031] Such profiled element 10 comprises:

- two parallel wings 11a, 11b, respectively a first wing 11a and a second wing 11b,
- a core 12, which is interposed and comprised between the two wings 11a, 11b and arranged on a plane that is perpendicular to the planes of arrangement of the two wings 11a, 11b.

[0032] The wings 11a, 11b have a longitudinal tab 13a, 13b, respectively a first tab 13a and a second tab 13b, which extend from the end of the respective wing 11a, 11b that is opposite the core 12, in the direction of the other wing 11b, 11a and parallel to the core 12.

[0033] The longitudinal tab 13a, 13b is adapted to give stiffness and self-support to the profiled element 10 even after its deformation to provide curved shapes.

[0034] One of the particularities of the invention resides in that the profiled element 10 has a plurality of bending preweakenings 14 both toward the internal surface 15 of the core 12 and toward the external surface 16 of the core 12.

[0035] In particular, said bending preweakenings 14 are constituted by triangular openings 17a, 17b, respectively first openings 17a and second openings 17b, and/or slits 18, which are substantially linear.

[0036] Specifically, triangular openings 17a, 17b are arranged along the wings 11a, 11b and correspond to and are mirror-symmetrical in pairs with respect to the central longitudinal plane of symmetry of the profiled element 10.

[0037] The expression "longitudinal plane of symmetry" means, in the present description, the plane of symmetry of the profiled element 10, which passes along its axis of longitudinal extension.

[0038] Multiple slits 18 are present on the core 12 with an axis of extension that is perpendicular to the axis of

extension of the core 12 and are aligned in pairs.

[0039] The triangular openings 17a, 17b have an isosceles and/or equilateral triangle-like profile, with a base 20 of the triangle and a vertex 19 that is opposite said base 20.

[0040] The base 20 of the triangle which constitutes the opening 17a, 17b is parallel to the core 12.

[0041] In particular, as is evident from Figures 1 and 2, the base 20 of the triangle which constitutes the opening 17a, 17b is:

- either proximate to/at the core 12, in the case of the first openings 17a,
- or proximate to/at the respective tab 13a, 13b, in the case of the second openings 17b.

[0042] The vertex 19 of the triangle that constitutes the opening 17, opposite the base 20, is arranged:

- either proximate to/at the core 12, in the case of the second openings 17b,
- or proximate to/at the respective tab 13a, 13b, in the case of the first openings 17a.

[0043] Preferably, the profiled element 10 has, along its wings 11a, 11b, multiple first openings 17a and second openings 17b which are arranged in an alternating manner.

[0044] As is evident from Figures 3 and 4, along the base 20 of the openings 17a, 17b it is possible to bend the profiled element 10 in order to give it a curvature.

[0045] The slits 18 are provided on the core 12, preferably so that at each pair of corresponding first openings 17a, one on the first wing 11a and one on the second wing 11b, there are six slits 18, so as to form three first pairs 22a, 22b, 23 of two aligned slits 18.

[0046] The first pairs 22a, 22b and 23 of slits 18 are respectively:

- two end pairs 22a, 22b, each arranged at a transverse sectional plane of the profiled element 10 that passes through one of the two ends 21a, 21b of the base 20,
- a central pair 23, arranged at the transverse cross-section of the profiled element 10 that passes through the vertex 19.

[0047] In one constructive variation, not shown in the figures, instead of the first pairs 22a, 22b, 23 of slits 18 there can be single slits that are comparable in length with the length of the first pairs 22a, 22b, 23.

[0048] In the example shown in Figures 1 and 2, the profiled element 10 has, on the core 12, at each pair of corresponding second openings 17b, one on the first wing 11a and one on the second wing 11b, a second pair 24 of aligned slits 18, at the transverse cross-section of the profiled element 10, which passes through the vertex 19.

[0049] In one constructive variation, not shown in the figures, the second pairs 24 of slits 18 may not be present or there may be, in their place, single slits that are comparable in length with the length of the second pairs 24.

[0050] Figures 3 and 4 partially show two examples of application of the profiled element 10.

[0051] Depending on the requirements, it is possible to deform the profiled element 10 by bending the bases 20 of a pair of corresponding first openings 17a and/or second openings 17b, one on the first wing 11a and one on the second wing 11b.

[0052] In practice, if it is necessary to obtain a profiled element that has a concavity directed toward the external surface 16 of the core 12, the base 20 of the first openings 17a is deformed, by acting on the core 12 in the direction of the tabs 13a, 13b, moving the central pair 23 of slits 18 closer to the tabs 13a, 13b.

[0053] If, instead, it is necessary to obtain a profiled element that has a concavity directed toward the internal surface 15 of the core 12, the base 20 of the second openings 17b is deformed, by acting on the tabs 13a, 13b, in the direction of the core 12.

[0054] In practice it has been found that the invention has achieved the intended aim and objects, providing a deformable profiled element that allows to be bent both with the concavity directed toward the internal surface of the core of the profiled element and with the concavity directed toward the external surface of the core of the profiled element.

[0055] The invention provides a deformable profiled element for which the installation technician does not need to know beforehand which type of bending he must give it during the installation of the partition structure.

[0056] Furthermore, the invention provides a deformable profiled element that allows the installation technician to reduce the space occupation and the warehouse volume with respect to similar profiled elements of the known type.

[0057] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may furthermore be replaced with other technically equivalent elements.

[0058] In practice, the materials used, so long as they are compatible with the specific use, as well as the contingent shapes and dimensions, may be any according to the requirements and the state of the art.

[0059] The disclosures in Italian Patent Application No. 102020000018214 from which this application claims priority are incorporated herein by reference.

[0060] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A deformable profiled element (10), having a longitudinal extension and a C-shaped transverse cross-section, said profiled element (10) comprising:

- two parallel wings (11a, 11b), respectively a first wing (11a) and a second wing (11b),
- a core (12), interposed and comprised between said two wings (11a, 11b) and arranged on a plane that is perpendicular to the planes of arrangement of said two wings (11a, 11b),

said profiled element (10) being **characterized in that** it has a plurality of preweakenings (14) for bending toward the internal surface (15) of said core (12) and toward the external surface (16) of said core (12).

2. The profiled element (10) according to claim 1, **characterized in that** said wings (11a, 11b) each have a longitudinal tab (13a, 13b), which extends from the end of the respective one of said wings (11a, 11b) that is opposite said core (12), in the direction of the other one of said wings (11b, 11a), and parallel to said core (12).

3. The profiled element (10) according to one or more of the preceding claims, **characterized in that** said bending preweakenings (14) are constituted by:

- openings (17a, 17b), respectively first openings (17a) and second openings (17b),
- and/or substantially linear slits (18).

4. The profiled element (10) according to one or more of the preceding claims, **characterized in that** said openings (17a, 17b) are arranged along said wings (11a, 11b) in pairs that correspond to and are mirror-symmetrical with respect to the longitudinal plane of symmetry of said profiled element (10).

5. The profiled element (10) according to one or more of the preceding claims, **characterized in that** a plurality of said slits (18) is present on said core (12), with an axis of extension that is perpendicular to the axis of extension of said core (12).

6. The profiled element (10) according to one or more of the preceding claims, **characterized in that** said openings (17a, 17b) have an isosceles triangle-like profile, with a base (20) of said triangle and a vertex (19) that is opposite said base (20), said base (20) being parallel to said core (12).

7. The profiled element (10) according to one or more of the preceding claims, **characterized in that**:

- said base (20) is:
- proximate to/at said core (12), in the case of said first openings (17a),
- proximate to/at the respective tab (13a, 13b), in the case of said second openings (17b), 5
- said vertex (19) is:
- proximate to/at said core (12), in the case of said second openings (17b),
- proximate to/at said tab (13a, 13b), in the case of said first openings (17a). 10

8. The profiled element (10) according to one or more of the preceding claims, **characterized in that** it has, along said wings (11a, 11b), a plurality of first openings (17a) and second openings (17b) which are arranged in an alternating manner. 15
9. The profiled element (10) according to one or more of the preceding claims, **characterized in that** said slits (18) are provided on said core (12) so that at each pair of corresponding first openings (17a), one on said first wing (11a) and one on said second wing (11b), there are six of said slits (18), so as to form three first pairs (22a, 22b, 23) of two aligned slits (18). 20
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10. The profiled element (10) according to the preceding claim, **characterized in that** said first pairs (22a, 22b, 23) are respectively:
- two end pairs (22a, 22b), each arranged at a transverse sectional plane of said profiled element (10) that passes through one of the two ends (21a, 21b) of said base (20), 30
 - a central pair (23), arranged at the transverse cross-section of said profiled element (10) that passes through said vertex (19). 35

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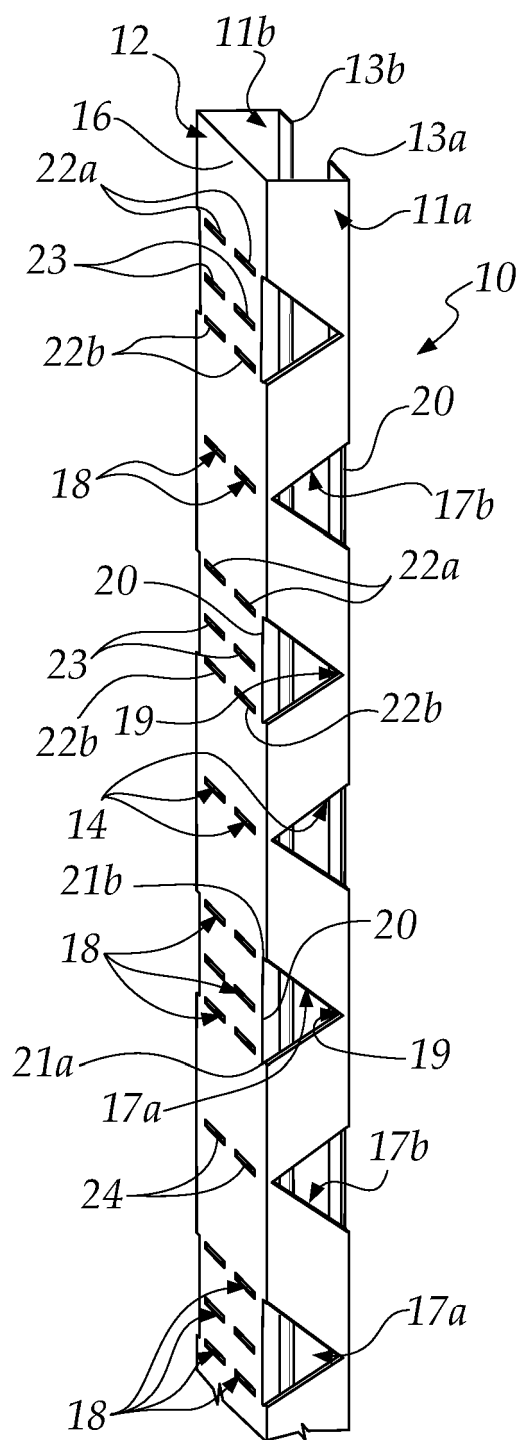


Fig.1

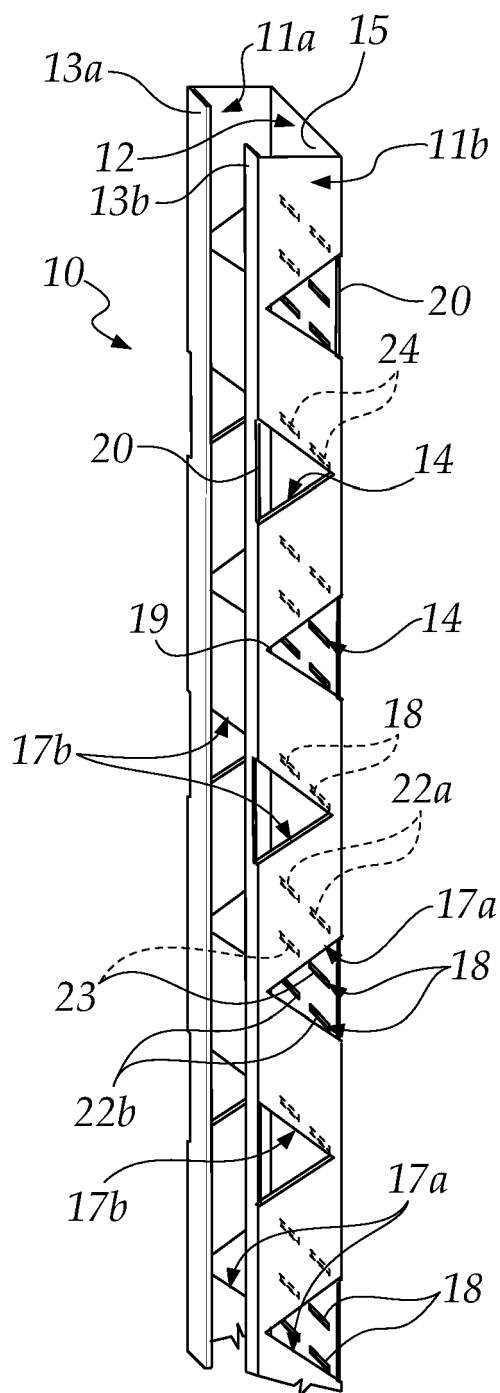
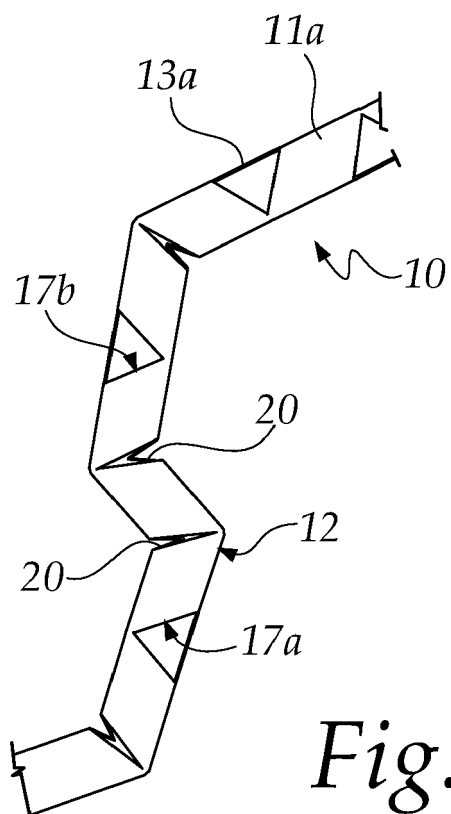
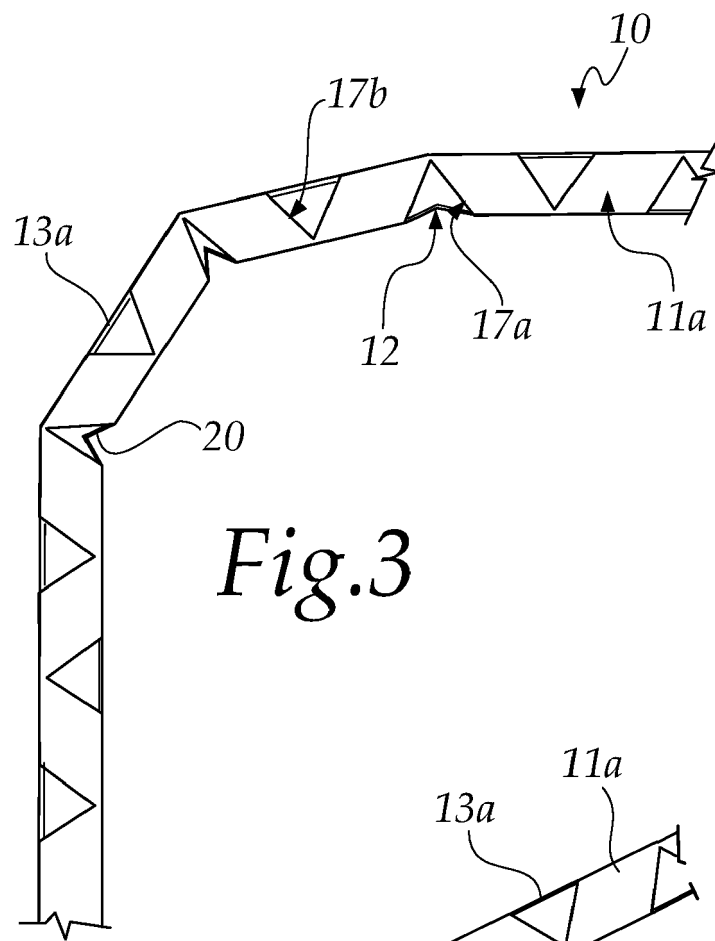


Fig.2





EUROPEAN SEARCH REPORT

Application Number
EP 21 18 0890

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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	WO 98/32931 A1 (FERRANTE MASSIMO [IT]) 30 July 1998 (1998-07-30) * page 8, line 25 - page 9, line 19; figures 5-9 *	1-10	INV. E04B2/74 E04C3/04
X	DE 296 19 739 U1 (STUCKENBROK GERD [DE]) 16 January 1997 (1997-01-16) * page 3, line 19 - line 29; figures 4, 5 *	1-10	
X	US 2019/242130 A1 (LEBLANG DENNIS [US]) 8 August 2019 (2019-08-08) * paragraph [0060]; figures 23, 24 *	1-10	
A	EP 2 942 446 A1 (ATENA SPA [IT]) 11 November 2015 (2015-11-11) * abstract; figures 1, 2, 5 *	1-10	
A	WO 2013/175272 A1 (CECCATO NICOLA [IT]) 28 November 2013 (2013-11-28) * the whole document *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04B E04C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 5 October 2021	Examiner Galanti, Flavio
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 18 0890

5 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
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05-10-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9832931 A1	30-07-1998	AT 210771 T	15-12-2001
		AU 720242 B2	25-05-2000
		BR 9807035 A	28-03-2000
		CA 2278005 A1	30-07-1998
		CZ 288899 B6	12-09-2001
		DE 69802912 T2	22-08-2002
		EP 0970283 A1	12-01-2000
		ES 2170473 T3	01-08-2002
		HU 0002192 A2	28-10-2000
		IT RM970039 A1	29-07-1998
		JP 2001509220 A	10-07-2001
		PL 334771 A1	13-03-2000
		PT 970283 E	28-06-2002
		RO 117198 B1	30-11-2001
		SI 9820020 A	31-12-1999
		TR 199901787 T2	21-09-1999
		US 6434908 B1	20-08-2002
		WO 9832931 A1	30-07-1998

DE 29619739 U1	16-01-1997	NONE	

US 2019242130 A1	08-08-2019	NONE	

EP 2942446 A1	11-11-2015	EP 2942446 A1	11-11-2015
		ES 2603804 T3	01-03-2017
		PL 2942446 T3	28-04-2017

WO 2013175272 A1	28-11-2013	EP 2855791 A1	08-04-2015
		ES 2599619 T3	02-02-2017
		PL 2855791 T3	31-01-2017
		WO 2013175272 A1	28-11-2013

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT 102020000018214 [0059]