

(19)



(11)

EP 4 556 646 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.05.2025 Bulletin 2025/21

(21) Application number: **24213342.9**

(22) Date of filing: **15.11.2024**

(51) International Patent Classification (IPC):
E04B 2/74 (2006.01) **A47F 11/02** (2006.01)
G09F 15/00 (2006.01) **A47F 5/00** (2006.01)
E04H 1/12 (2006.01) **A47G 5/00** (2006.01)
F21V 33/00 (2006.01)

(52) Cooperative Patent Classification (CPC):
E04B 2/7416; A47F 11/02; G09F 13/04;
G09F 15/0012; G09F 15/0068; A47G 5/00;
E04B 2002/7479; E04B 2002/7481; E04H 1/1272;
F21V 33/006; G09F 2013/222

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR
 Designated Extension States:
BA
 Designated Validation States:
GE KH MA MD TN

(30) Priority: **17.11.2023 IT 202300024471**

(71) Applicant: **Cracco, Nicola**
36051 Creazzo (VI) (IT)

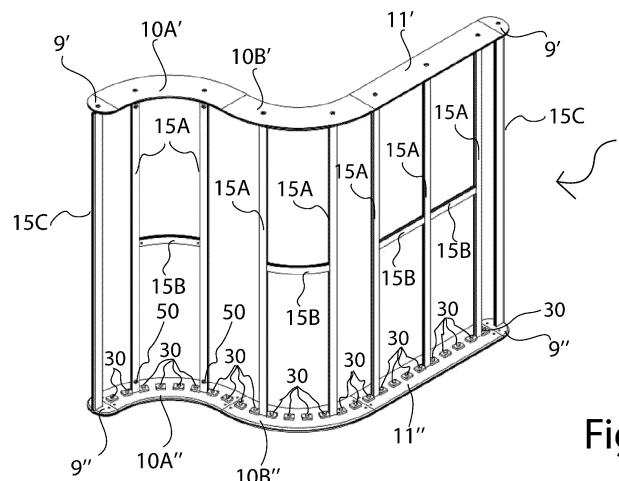
(72) Inventor: **Cracco, Nicola**
36051 Creazzo (VI) (IT)

(74) Representative: **Burchielli, Riccardo et al**
Barzano & Zanardo S.p.A.
Via Piemonte 26
00187 Roma (IT)

(54) **MODULAR STRUCTURE FOR REALIZING WALLS, ADVERTISING DISPLAYS, DISPLAYS FOR COMMUNICATION AND FOR FURNITURE AND METHOD OF ASSEMBLING SAID STRUCTURE**

(57) A modular structure (1) for realizing walls, panels or components for booths and exhibition spaces, advertising displays, communication and furnishing screens, comprising a frame, which includes at least one lower support and at least one upper support, identical and parallel to the lower support. The supports are mutually spaced and rigidly coupled by means of one or more vertical uprights (15A, 15C) placed inside the frame. The modular profiles include rectilinear geometry modular profiles (11) and curved geometry modular profiles (10) and have a first portion (10A', 10B', 11') outside

the frame and a second portion (10A', 10B', 11') inside the frame and the portion (10A', 10B', 11') inside the modular profiles has a plurality of housings (30) for LED lights and for fixing the vertical uprights (15A, 15C). The modular profiles of the upper and lower supports have, in correspondence with the front and rear surfaces of the frame, at least one recessed seat (14), arranged at an angle varying between 60° and 80°, and preferably arranged at 65°, with respect to a vertical plane, within which a grommet (26) is inserted and fixed, to which at least one sheet and/or laminate (25) is stably connected.

**Fig.2**

Description

[0001] The present invention relates generally to a modular structure of a mixtilinear shape, for realizing walls, panels or components for booths and exhibition spaces, display of advertising, communication and furnishing screens.

[0002] The modular structure in question comprises a frame of substantially rigid material, comprising straight and curved elements or components, and one or more laminates or sheets of textile material connected to said frame.

[0003] More particularly, the invention relates to a frame made of at least one substantially flat lower support, intended to rest on the ground or on a stationary surface, and at least one upper support substantially identical and parallel to the lower support, the two supports being mutually spaced apart and rigidly coupled by means of one or more vertical uprights.

[0004] Both supports comprise modular profiles that can have a linear or curved shape and have mounting housings with the vertical uprights, which are made of extruded aluminium, and housings for housing LED lights.

[0005] Vertical uprights can also be connected with horizontal uprights.

[0006] In addition, one or more sheets or laminates (in front of and/or behind the rigid frame) are attached to the lower and upper supports, so that the frame is completely covered.

[0007] The sheets are tensioned to create a flat, homogeneous surface and can be printed; thanks to the LED lights inside the frame, they become high-impact displays.

[0008] New and inventive are both the shape of the profiles that make up the lower and upper support and the system that allows the vertical tensioning of the sheets to be adjusted.

[0009] The profiles comprise rigid horizontal elements made of plastic or composite material by means of 5-axis numerically controlled machines, which simplifies production and quality output.

[0010] Inside these profiles there is a 65° lateral recess for the housing of a plastic/silicone or recycled plastic grommet or 'keder', which clamps the sheets covering the frame, allowing very effective anchorage, especially in the curved areas of the supports; in addition, a threaded block is inserted on the vertical uprights, which, by activating a customised bolt, acts on the extension of the vertical dimension.

[0011] Thus, with a reduced dimension of the uprights, an easy coupling of the sheets is possible; furthermore, by unscrewing the bolts connected to the upright block, it is possible to spread the horizontal profiles further apart until an optimal tensioning of the sheets is achieved, in order to obviate defective undulations of the sheets. The aim of the present invention is to solve the typical problems of solutions, such as those mentioned in document

IT102020000032939, where the housing of the sheets is formed with a 90° lateral recess which results in the possibility of the sheets becoming disengaged in curved areas.

[0012] Another aim of the present invention is to realise modular profiles with an end side in a circular form, which, combined with a vertical closing element of the frame, itself circular and not flat, makes it possible to create a more harmonious form of the entire modular structure, where it is also possible to accommodate other LED lights.

[0013] Another aim is to be able to create modular structures of various shapes according to customer requirements.

[0014] These and other aims, which will appear more clearly in the following discussion, are achieved by a modular structure with a mixtilinear shape, to realise walls, panels or components for stands and trade fair premises, advertising displays, communication and furnishing screens with new straight and curved modular profiles to compose the lower and upper supports of the rigid frame to which one or more cover sheets are associated, according to claim 1 attached.

[0015] Further detailed technical specifications are contained in the following dependent claims.

[0016] Other features and advantages of the invention will be more apparent from the description of one or more preferred and exemplary, but not limiting, embodiments and the accompanying drawing sheets, wherein:

- figure 1 represents a perspective view of the modular structure of mixtilinear shape in one possible embodiment, in its complete construction form, according to the invention;
- figure 2 represents a perspective view of the inner frame of the modular structure of mixtilinear shape in another possible embodiment, comprising lower and upper supports made from the straight and curved modular profiles, connected to the vertical uprights and with further horizontal uprights, also comprising LEDs, according to the invention;
- figure 3 represents a front view of a section of the modular structure, in this case with straight modular profiles, and exploded views of the shape of the same profiles composing the lower and upper supports, according to the invention;
- figure 4 represents a front view of the rigid frame formed by the modular profiles of the lower and upper supports fixed to the vertical uprights and the components of the fixing and height adjustment system of the same modular profiles, which are fixed to the vertical uprights, and an exploded view of the lateral areas of said profiles wherein the 65° groove for housing the sheet is obtained, according to the invention;
- figure 5 represents a front view of the inner side of the different types of straight or curved shapes of said

modular profiles, according to the invention;

- figure 6 represents a front view of the outer part of the different types of straight or curved shapes of the modular profiles, according to the invention.

[0017] With reference to the attached figures, the modular structure (1) of a mixtilinear shape is realized with two supports, an upper and a lower one, comprising modular profiles, connected together by means of barrel couplers (12); some modular profiles have a curved geometry (10) and have an outer part (10A' - 10B') and an inner part (10A'' - 10B''), while other modular profiles are realised in a rectilinear geometry (11) and also have an outer part (11') and an inner part (11'').

[0018] In addition, profiles (10, 11), made of plastic or composite material, can have shaped ends (9), which themselves have an outer part (9'') and an inner part (9').

[0019] On the inner parts (10A'', 10B'', 11'') of the modular profiles housing (30) are made for LED lights and for the attachment of vertical uprights (15A, 15C), which are made of extruded aluminium, while other horizontal uprights (15B), of the same material, can be used to connect the vertical uprights.

[0020] The end modular profiles and any shaped ends (9) of the upper and lower supports of the modular structure (1) have, laterally and at the front and rear parts of the structure, one or more recessed seat (14), preferably arranged at 65° with respect to the vertical uprights (15A, 15C) and realised by CNC machining, in order to be able to insert a sheet and/or a laminate (25), stabilising them by means of a rubber grommet (26).

[0021] The recessed seat (14) is designed to ensure optimum anchorage of the grommet (26) and can have a variable angle to the sheet (25) between 60° and 80°, depending on the specific requirements and the desired curvature.

[0022] The modular structure (1) is then closed at the two sides by the aforementioned sheets or laminates (25), while at the two end portions a flat terminal (20), placed in correspondence with a straight modular profile (11), or a double groove end-piece (arranged at 90° to the sheet or laminate (25)), placed in correspondence with a curved end profile (9) and near the vertical end of the sheet (25), can be fixed. The fastening system of the vertical uprights (15A, 15C) to the modular profiles (9, 10, 11) of the lower support envisages the use of a coupling seat on the profile of the vertical upright (15A, 15C) where at least a first bolt (40) with washers (41) acts on a threaded insert (45), which is locked inside the upright by means of a screw + fastening system (50).

[0023] Analogously, for the fastening system between the vertical upright (15A, 15C) and the upper support, at least a second bolt (40) with washer (41), operating on a threaded insert (46), holds the upper modular profile, by means of a sizer (44); thus, loosening the second bolt (40) causes the upper modular profile to move away from the vertical upright (15A, 15C), achieving the tensioning of the fabric of the sheet (25) to the optimum result.

[0024] If the frame is suspended, the second bolt (40) can be replaced by an eyebolt for hanging.

[0025] The assembly methods of the modular structure provide for:

5

1) the assembly of the horizontal modular profiles (9, 10, 11), upper and lower, by means of barrel couplers (12);

10

2) the cabling of the LED lighting system in the predetermined housings (30);

3) the assembly of the vertical uprights (15A, 15C) with various screws and any horizontal intermediate uprights (15B), which are used to increase structural rigidity

15

4) the fixing in the released position between the modular profiles (9, 10, 11) and the vertical uprights (15A, 15C) to facilitate the attachment of the sheets or laminates (25);

20

5) the hooking of the sheets or laminates (25) (positioned at the front and/or rear of the frame) to the modular profiles (9, 10, 11) of the structure, by means of the insertion of the perimeter grommet (26), which, in the case of the use of sheet (25), are sewn to the fabric of the sheet (25) at the recessed seat (14) specially created in the modular profiles (9, 10, 11);

25

6) the driving of the bolts (40) located in the upper profiles (9, 10, 11), in order to obtain an optimal elongation in height of the modular structure and, consequently, an optimal tensioning of the fabric (in the case of the use of sheet (25)).

30

[0026] The invention thus conceived and illustrated herein is susceptible to numerous modifications and variations, all within the scope of the inventive concept as defined by the attached claims.

35

[0027] Furthermore, all details may be replaced by other technically equivalent elements. Finally, the components used, provided they are compatible with the specific use, as well as the dimensions, may be any according to the requirements and state of the art.

40

[0028] Where features and techniques mentioned in any of the claims are followed by reference marks, such reference marks have been included for the sole purpose of increasing the intelligibility of the claims and, consequently, have no limiting effect on the interpretation of each element identified, by way of example, by the same.

45

Claims

50

1. A modular structure (1) for realizing walls, panels, or components for booths and exhibition spaces, advertising displays, displays for communication, and for furniture, comprising

55

- a frame made of substantially rigid material, including at least one lower support, flat and intended to rest on the ground or on a flat,

stationary horizontal surface, at least one upper support, identical and parallel to said lower support, said lower and upper supports being placed on mutually spaced horizontal planes and being rigidly coupled by means of one or more vertical uprights (15A, 15C) placed internally to the structure and preferably made of extruded aluminum,

- and at least one front and/or rear wall of the frame consisting of at least one sheet and/or laminate (25), - wherein each of said lower and upper supports comprises modular profiles, connected to each other by means of barrel couplers (12) and preferably made of plastic or composite material,

- wherein said modular profiles include modular profiles of rectilinear geometry (11) and modular profiles of curved geometry (10), and said modular profiles have a first portion (10A', 10B', 11') outside said frame and a second portion (10A', 10B', 11') inside said frame,

- and wherein said first portion (10A", 10B", 11") inside the frame of the modular profiles presents a plurality of housings (30) for LED lights and for the attachment of said vertical uprights (15A', 15C), **characterized by** the fact that said modular profiles of the upper and lower supports of said modular structure (1) have, at the front and rear surfaces of said frame, at least one recessed seat (14), arranged at an angle varying between 60° and 80°, and preferably arranged at 65°, with respect to a vertical plane, within which is inserted and fixed a grommet (26), to which is stably connected said at least one sheet and/or laminate (25).

2. Modular structure (1) according to claim 1, **characterized by** the fact that said recessed seat (14) is made by CNC machining.

3. Modular structure (1) according to at least one of the preceding claims, **characterized by** the fact that said modular profiles are connected to shaped ends (9), which are provided with first portion (9') outside said frame and second portion (9") inside said frame.

4. Modular structure (1) according to at least one of the previous claims, **characterized by** the fact that said vertical uprights (15A, 15C) are connected to horizontal uprights (15B), which are also preferably made of extruded aluminum.

5. Modular structure (1) according to at least one of the preceding claims, **characterized by** the fact that, in correspondence with end portions of said lower and upper supports and in the proximity of vertical ends of said sheet and/or laminate (25), flat terminals (20) or double hollow terminals are fixed, said hollow being

arranged at 90° to said sheet and/or laminate (25).

6. Modular structure (1) according to at least one of the preceding claims, **characterized by** the fact that said vertical uprights (15A, 15C) are fixed to said modular profiles of the lower support by means of an engagement seat on each vertical upright (15A, 15C), wherein acts at least a first bolt (40) with washers (41), which operates on a threaded insert (45), which is locked inside said vertical upright (15A, 15C) by means of a fastening system (50).

7. Modular structure (1) according to at least one of the preceding claims, **characterized by** the fact that said vertical uprights (15A, 15C) are fixed to said modular profiles of the upper support by at least a second bolt (40) with washer (41), which operates on a threaded insert (46) suitable for retaining said modular profiles of the upper support by means of a sizer (44), or by means of an eyebolt for hanging.

8. Method for mounting a modular structure (1) as in claims 1-7, **characterized by** providing the following steps:

- assembly of said modular profiles of said lower and upper supports by means of said barrel couplers (12);

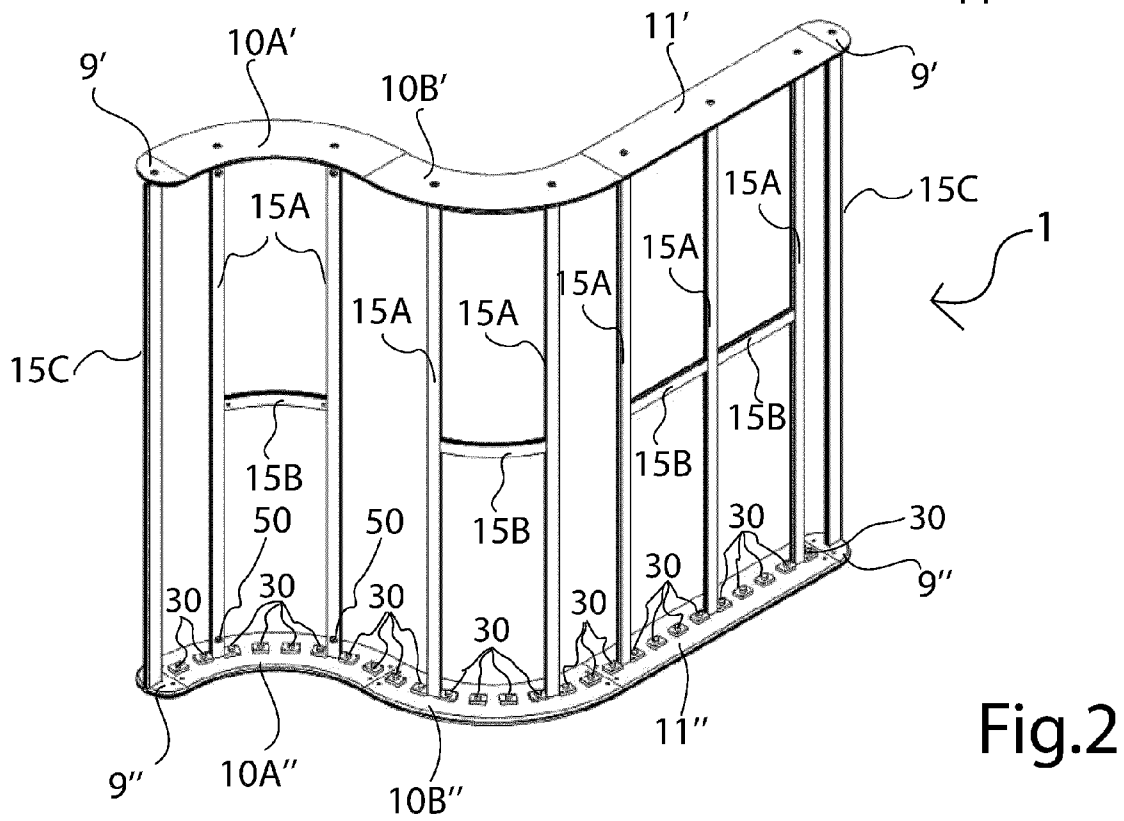
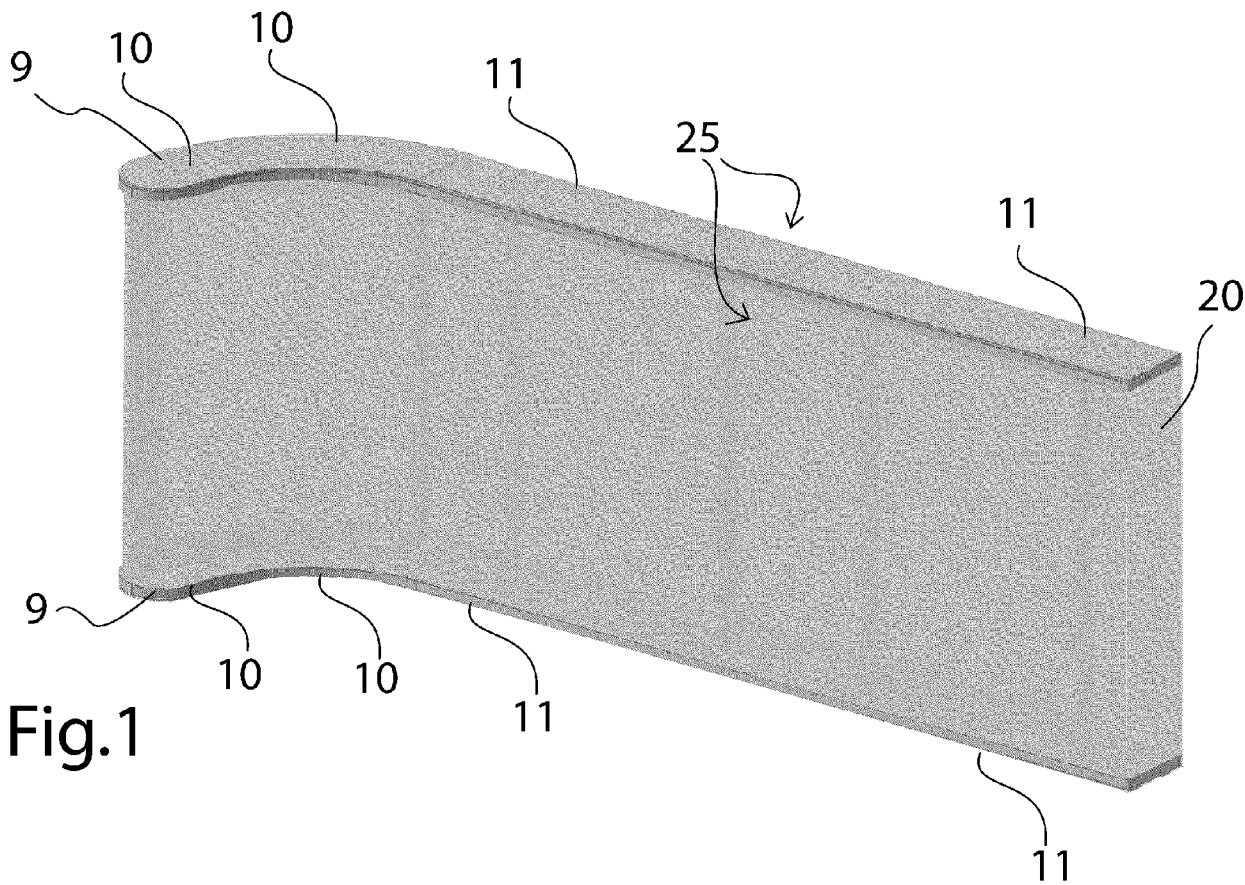
- wiring of said LED lights in the predetermined locations (30);

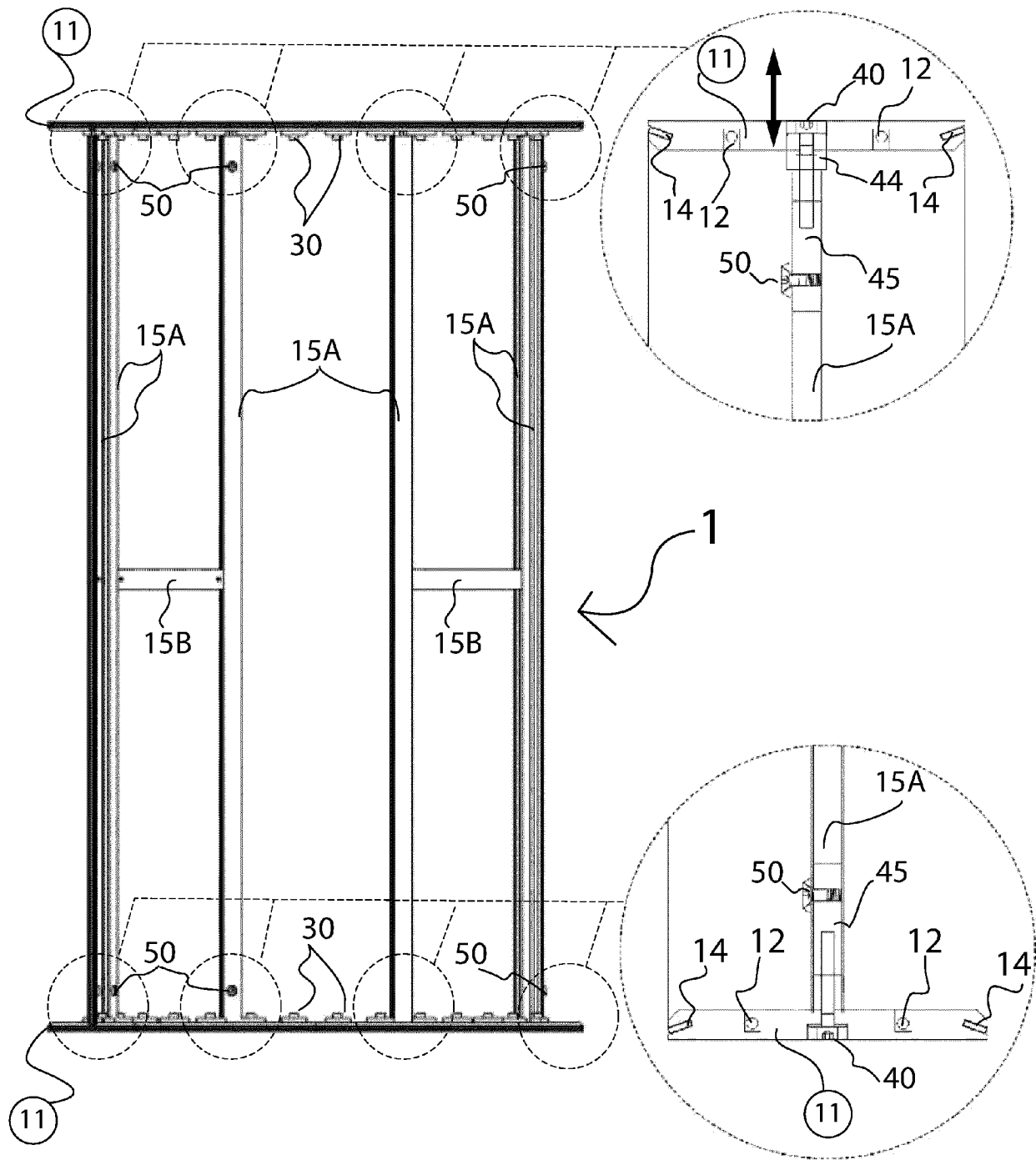
- assembly of said vertical uprights (15A, 15C);
- fixing in released position between said modular profiles of the lower and upper supports and said vertical uprights (15A, 15C);

- attaching said at least one sheet and/or laminate (25), at at least one front and/or rear wall of said frame, to said modular profiles of said lower and upper supports, by inserting said at least one grommet (26);

- stitching of said at least one grommet (26) to the fabric of said sheet (25), at said recessed seat (14), in the case of positioning a sheet (25) at said at least one front and/or rear wall of said frame;

- actuation of said first and second bolts (40) placed in the modular profiles of said lower and upper supports, in order to obtain an optimal elongation in height of the modular structure (1).





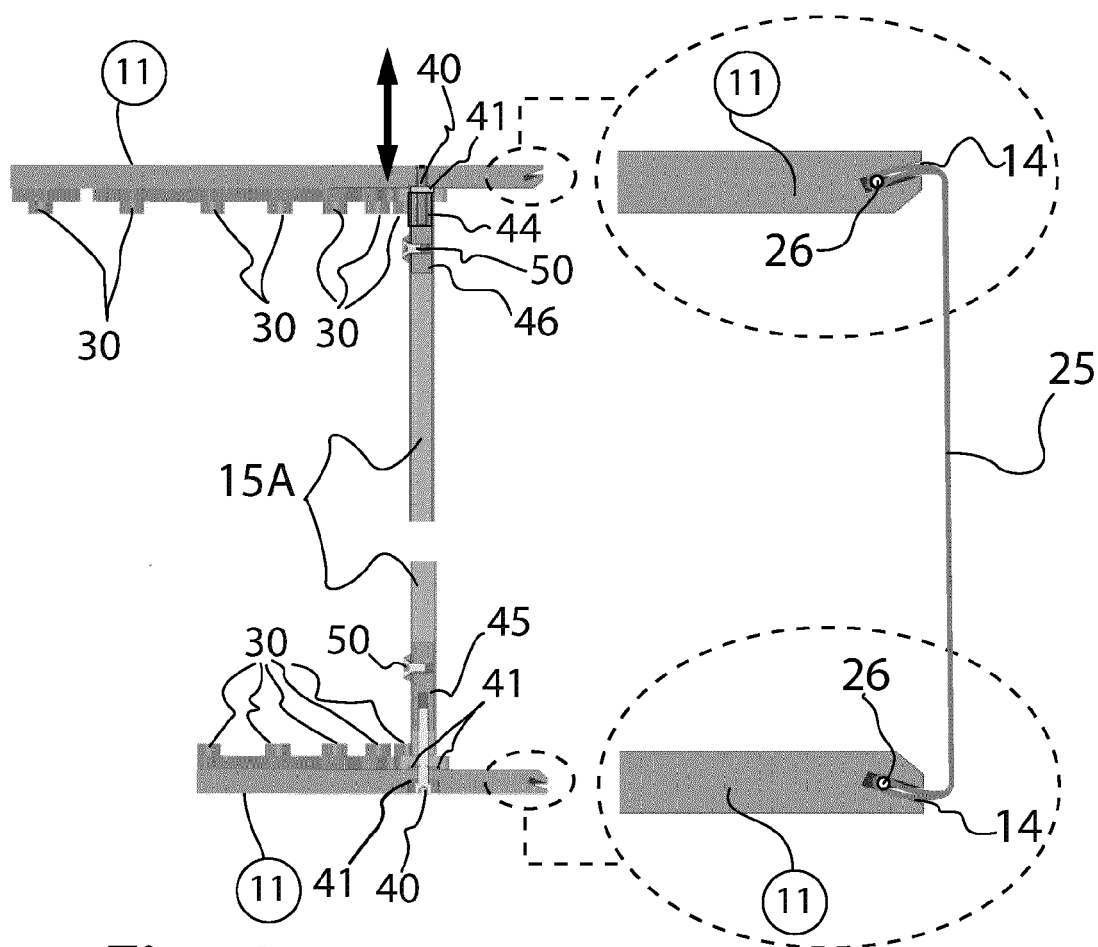


Fig. 4

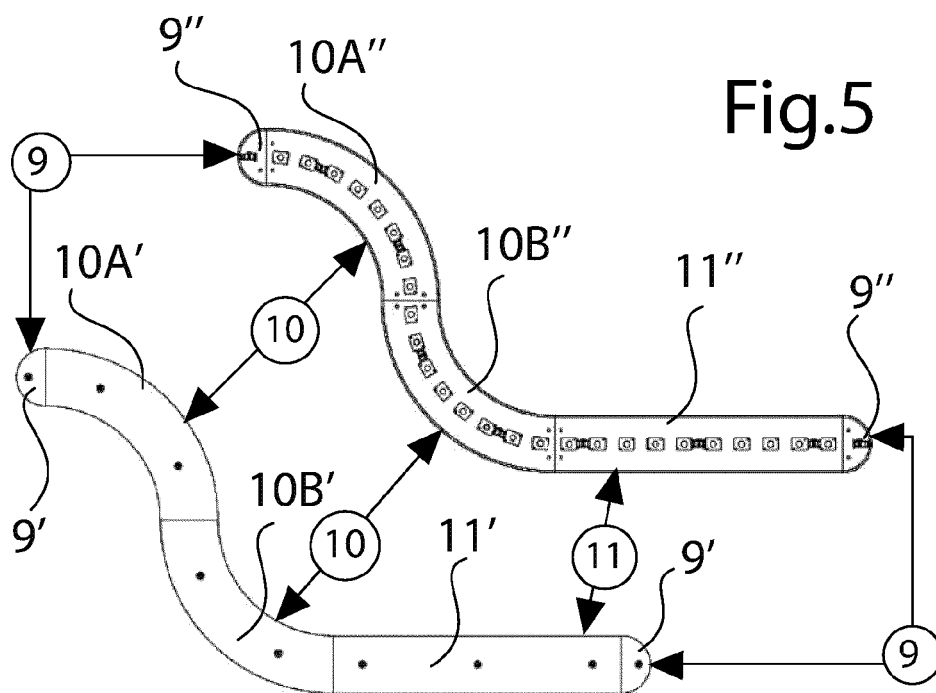


Fig.5

Fig.6



EUROPEAN SEARCH REPORT

Application Number

EP 24 21 3342

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 03/023740 A2 (SKYLINE DISPLAYS INC [US]; FRITSCHKE MARK [US] ET AL.) 20 March 2003 (2003-03-20) * abstract; figures 1,2 *	1-8	INV. E04B2/74 A47F11/02 G09F15/00
A	KR 2011 0122237 A (LEE MYUNG WOO [KR]) 10 November 2011 (2011-11-10) * abstract; figures 1-9 *	1-8	ADD. A47F5/00 E04H1/12 A47G5/00 F21V33/00
A	DE 101 37 059 A1 (CHENEL GUY G [FR]) 2 May 2002 (2002-05-02) * abstract; figures 1-10 *	1-8	
A	ES 2 541 580 A2 (DYR INGENIEROS S L P [ES]) 21 July 2015 (2015-07-21) * abstract; figures 1-5 *	1-8	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04B A47F E04H F21V A47G G09F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		28 February 2025	Couprie, Brice
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			

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

EP 24 21 3342

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

28-02-2025

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03023740 A2	20-03-2003	AU 2002347767 A1	24-03-2003
		CA 2460439 A1	20-03-2003
		CN 1585613 A	23-02-2005
		DE 10297216 T5	26-08-2004
		GB 2394825 A	05-05-2004
		US 2003047294 A1	13-03-2003
		WO 03023740 A2	20-03-2003

KR 20110122237 A	10-11-2011	NONE	

DE 10137059 A1	02-05-2002	DE 10137059 A1	02-05-2002
		FR 2812801 A1	15-02-2002

ES 2541580 A2	21-07-2015	NONE	

15

20

25

30

35

40

45

50

55

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- IT 102020000032939 [0011]