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

(11) EP 3 753 455 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
23.12.2020 Bulletin 2020/52

(21) Application number: **20179310.6**

(22) Date of filing: **10.06.2020**

(51) Int Cl.:
A47D 11/00 *(2006.01)* ***A47C 13/00*** *(2006.01)*
A47C 27/14 *(2006.01)* ***A47B 85/00*** *(2006.01)*

(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 MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **17.06.2019 DK PA201900723**

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(54) A MODULAR FURNITURE SYSTEM FOR PROVIDING A WIDE VARIETY OF FURNITURE AND USE OF SAME

(57) A modular furniture system (1) for providing a wide variety of furniture. It comprises a number of modular elements (2), each module element (2) comprises a first substantially flat surface (3) and an opposite placed second surface (4).

The second surface (4) and the side-surfaces (5,6,7,8) are essentially plane. The module elements (2) are provided in a flexible material. Further, the modular furniture system (1) comprises a frame surrounding a square or rectangular cavity (11) bounded by the frame (10). The frame is configured to receive and fix the module elements (2) in a defined position for providing the furniture. Both the frame (10) and the module elements (2) are provided in a foam rubber material.

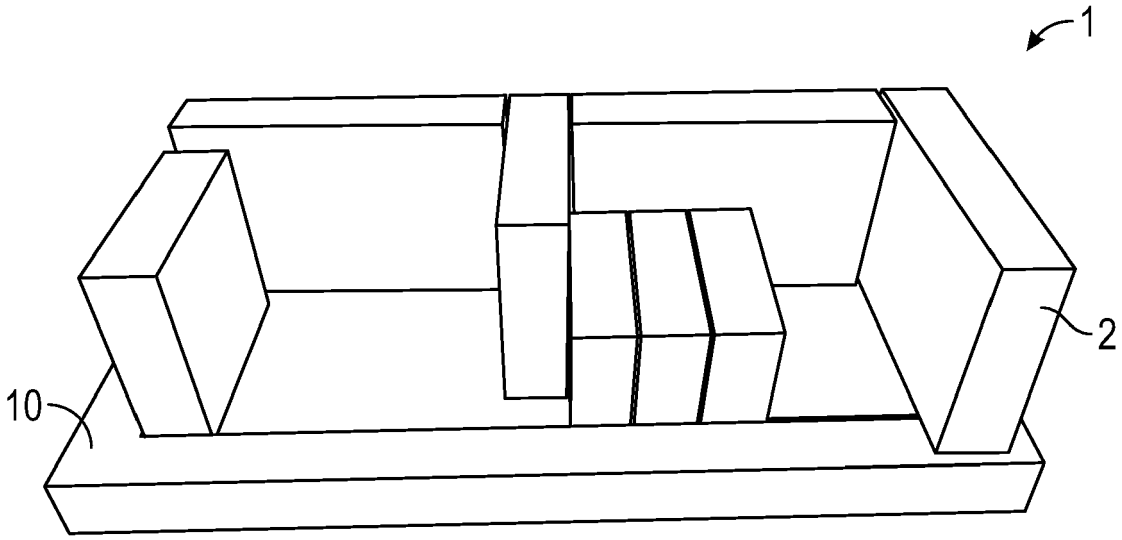

FIG. 5

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Description

[0001] The invention relates to a modular furniture system for providing a wide variety of furniture and comprising a number of modular elements, each module element comprises a first substantially flat surface and an opposite placed second surface, said two surfaces are connected with side surfaces, a first side-surface having a length l_1 and a height t , an opposite second side-surface having a length l_1 and a height t as well as a third side-surface having a length l_2 and a height t, and an opposite fourth side-surface having a length l_2 and a height t, said surfaces providing rectangular or square module elements,
the second surface and the side-surfaces are essentially plane, the module elements are provided in a flexible material, and the modular furniture system comprises a frame surrounding a square or rectangular cavity bounded by the frame, said frame is configured to receive and fix the module elements in a defined position for providing the furniture.

[0002] The invention also relates to use of the modular furniture system for providing a furniture comprising at least one of following furniture: a chair, a sofa, a bed, a table or a combination thereof and for use by children.

[0003] Modular furniture is versatile constructions and allows for individual distinctive features while at the same time reducing the cost of furnishing a home when using a modular furniture system.
Modular furniture systems exist that contain specific individual elements to form a piece of furniture. However, as the individual pieces are generally very specific, they are often used to form sitting groups and cannot be transformed into other furniture.
Thus, there is a need for a modular furniture system that allows modular elements to be interchanged to form a plurality of sitting, sleeping and other furniture units. Modular furniture, which consists of individual module elements that can be formed into a variety of furniture units, is very advantageous. It allows a person to furnish a room cheaply, and when desired, can be changed by combining the module elements into a whole new arrangement.

[0004] US9585472 relates to a modular furniture system comprising three modules shaped as square pillows which can be assembled for a bed, a drawer system, and the individual module may work as a resting cushion in itself. One side of the cushions is flat, while the other side is provided with ribs which are spaced from the floor and which act as a support leg. The system has its natural limitations in forming various furniture.

[0005] DK 93 00433 U4 shows a furniture system that can be used for both sleeping and play purposes. The system includes a rectangular frame with a flat bottom and side walls. Rectangular cushions are arranged for placement in the area bounded by the frame in various configurations. The system can provide different types of furniture, preferably for children.

[0006] US 3817573 A discloses a furniture system which in one embodiment comprises a rectangular frame with side walls and a bottom. Two rectangular cushions are arranged for placement in the frame. Each cushion has a soft side and a hard side. Thus, the furniture system, depending on how to turn the cushions, can act as a pouf or as a coffee table.

[0007] It is the object of the present invention to improve known furniture module systems where the above disadvantages are overcome, or at least to provide a useful alternative. The present invention makes it possible to create different pieces of furniture from the same basic modular units without the need to use tools, fasteners or the like to provide the different furniture. The invention is particularly well suited for furnishing a children's room.

[0008] According to the invention, there is provided a modular furniture system as set forth in the preamble, and that both the frame and the module elements are made in a foam rubber material.

[0009] Foam rubber is a common term for both polyether and cold foam materials with open/closed cells of many qualities. Quality is among other things characterized by weight/hardness (kg per m3 foam), tensile strength, elasticity and fire-retardant properties.
A suitable foam rubber material is thus polyether foam rubber material having the data 25/38. The fibers in polyether foam are softer fibers compared to a cold foam and thus often provide a softer comfort. The polyether foam is distinguished by being moisture resistant, flexible, thermal and sound insulating as well as lightweight. It can be coated and applied an adhesive. The foam chosen has a density of 23-26 kg / m3, a tensile strength of 3.4-4.25kPa, an elasticity of 38-42% preferably 40%, a tensile strength of at least 100 kPa and elongation at break of at least 175%.
An alternative is cold foam. It is a highly elastic foam type with a high carrying capacity. Cold foam provides good sitting and lying comfort, it breathes well, and has high perspiration. Cold foam is flame-retardant.
The cold foam is a more expensive upholstery material compared to polyether, but on the other hand, it provides better sitting comfort in the long run, the durability and carrying capacity being significantly better than that of polyether, which is clearly also perceived as sitting comfort. A special kind of cold foam is CMHR foam. It is a cold foam made extremely flame retardant. CMHR foam is also used for mattresses and furniture in ships, institutions, etc., where special legal requirements apply.

[0010] The system according to the invention comprises a number of pillows/cushions with different or same dimensions. Each cushion has preferably the same thickness as the other cushions corresponding to the height h. The system further comprises a closed frame encircling a square or rectangular cavity.

[0011] The purpose of the shape is to keep the module elements in place depending on which furniture is to be designed. The outer circumference of the frame may assume different shapes such as oval, circular square or rectangular. Preferable the outer circumference is rec-

tangular or square.

[0012] The frame is placed in the room that should be furnished, and the module elements are placed in different positions down in the cavity. They may be placed in such a way that the cavity is filled by the first or the second side surface placed with abutment against bottom-cavity of the frame. This provides a bed when the entire cavity is filled in this way. More cushions can be placed on top whereby a chair or a table is designed.

[0013] The elements may also be placed in such a way that they are placed upright in the cavity and is kept in place by the friction towards the delimiting side surfaces in the cavity and the other module elements. In this way, a backrest, armrests and chair / sofa or table can be formed. Depending on the length of the frame, the system can form many different furniture units. Thus, it can include in one and the same frame a chair, a sofa and a table.

Several frames may be connected to each other by the outer surface of the frame comprising fastening means such as Velcro fasteners. Thereby several frames are attached to each other, thus expanding the possibilities for a furniture arrangement. The frames are suitably shaped square or rectangular in the outer circumference. The module elements are made of a flexible material, soft and elastic in its structure. Conveniently, it is covered with a fabric material such as canvas, woven fabric. l_2 may be larger, smaller or identical to l_1.

[0014] The simplicity of the modular furniture system according to the invention makes it easy to move it, not only from one room to another, but from one residence to another. An assembly of a furniture by the present invention - regardless of whether it is a bed, a chair, a sofa, a seating area with built-in table, etc. - can be provided without the use of tools and fasteners.

[0015] According to one embodiment, the length l_2 is identical or different from the length l_1 and can assume different values between different module elements, and the length l_1 assumes the same and a fixed value for all the module elements, whereby the module elements among themselves can assume square and/or different dimensioned rectangular shapes.

[0016] By constructing the module elements as indicated, a high degree of freedom is obtained. In the case where they have the same thickness, it is possible to build even horizontal surfaces, which is relevant, for example, for the construction of a bed.

[0017] According to one embodiment, the furniture system comprises module elements, where l_2 of a module element is different from l_2 of another module element.

This provides a high degree of freedom in the establishment of diverse furniture.

[0018] According to one embodiment, the frame comprises a bottom fasten to a lower surface of the frame and provided in a flexible material such as a textile, a foam rubber material or a rubber mat.

This makes it easy to move a designed piece of furniture, as the bottom ensures that the cushions do not fall out when the frame is lifted off the floor. At the same time, the bottom stabilizes the frame. The bottom is quite thin essentially the same thickness as the material enclosing the foam material of the frame.

[0019] According to one embodiment, the cavity is delimited by the substantially flat frame side walls, where to opposite placed first frame side walls has a length extension l_1.

[0020] This ensures a good friction between frame and module units, so that the constructed furniture can retain its configuration even under greater weight, with all the module elements assuming the same extent l_1 on one side and thus fitting into the frame corresponding to the side with the extent l_1.

[0021] According to one embodiment, two other opposite placed second frame side walls have a length extension larger than l_1.

[0022] According to one embodiment, the height h of the frame measured between an upper surface and an opposite lower surface adapted to turn towards a floor has at least the same value as the height t of the module elements. This ensures that when designing a bed, bench or chair with a low seat height, the frame and cushions will align with each other.

[0023] According to one embodiment, the frame comprises four side-beams arranged to provide the square or rectangular frame, and the cross-section of each side-beam is square or rectangular and the surrounding four side of the cross-section all have at least a length t equal to the height of a module element.

This provides a good rigidity of the frame.

[0024] According to one embodiment, each module element is a cushion/pillow having with a rectangular or square outer circumference.

[0025] According to one embodiment, the furniture system also includes a flexible band comprising a first band side and an opposite second band side and the band comprises a Velcro fastener such that the first band side comprises Velcro hoops and the second band side comprises Velcro loops.

This allows the designed furniture to be further fixed in relation to the fixation that the frame entails. The fixing may be relevant when a piece of furniture designed according to the invention is to be used by persons of great weight. The Velcro loop means the part of a Velcro that consists of "hair"/the threaded material which the hooks from the other Velcro part can intervene.

[0026] According to one embodiment, the furniture system comprises several bands having different length and that at least one band has a length being larger that the inner circumference of the frame and making it possible to tie the band around a stack of module elements having an outer circumference equivalent to the inner circumference of the frame.

[0027] According to one embodiment, each module element is a pillow/cushion with a rectangular or square outer circumference and that the pillow/cushion compris-

es a strap placed om at least one side surface.
One or more straps in conjunction with a band placed in the strap(s) may help to fix the cushions among themselves.

[0028] According to one embodiment, the foam rubber material is a polyether foam or cold foam.

[0029] According to one embodiment, the module elements are covered with woven fabric or canvas, alternatively a leather material and that the frame is covered with the same material as the module elements.

[0030] According to one embodiment, the bottom is made in the same material and with the same thickness as the material which encloses the foam rubber material of the frame.

[0031] The invention will then be explained in more detail with reference to the figures, in which:

FIG. 1 shows a modular furniture system according to the invention comprising a frame and module elements designing a bed

Fig 2. shows the frame shown in fig. 1

Fig 3 shows a selection of the module elements shown in fig. 1

Fog 4 shows a furniture comprising two seats formed of the modular furniture system according to the invention.

FIG. 5 shows another furniture comprising two seats and a table made by the modular furniture system according to the invention

FIG. 6 shows a band that may contribute to stabilize different constructions of furniture.

[0032] The invention will now be explained in more detail with reference to fig. 1, 2 and 3. Fig. 1 shows a modular furniture system 1 according to the invention comprising a frame 10 and three module elements 2 placed in a cavity 11 in the frame 10 whereby a bed is provided.
The thickness t of the module elements is the same as the height h of the frame measured between the lower surface 13 of the frame and the upper free surface 22 of the frame. Each module element 2 - see fig. 3 - comprises a first substantially flat surface 3 and an opposite second surface 4, the two surfaces are connected to each other with side surfaces. These comprise a first side surface 5 with a length l_1 and a thickness t, an opposite second surface 6 with a length l_1 and the thickness t, a third side surface 7 having a length l_2 and the thickness t and an oppositely located fourth side surface 8 having a length l_2 and the thickness t, which surfaces 3,4,5,6,7,8 provide rectangular or square module elements 2.
Here, the module elements 2 are of different dimensions, however, such that they all have the same thickness t and all have a length l_1 which assumes the same value for all module elements 2. The dimensions of the module elements 2 and of the cavity of the frame 10 are respectively adapted so that it is possible to fill the cavity 11 of the frame 10 with the module elements/cushions 2, either by laying them with the largest surface at the bottom of the cavity 11 of the frame 2 and/or that they are set upright so as to rest on one of the surfaces 5,6,7,8 with the thickness t. Each module element 2 has advantageously a strap 21 placed on one of the side surfaces 5,6,7,8 and either with its length axis parallel to the longitudinal width of the side surface and / or perpendicular to same. This strap 21 can be used to fasten a flexible band 15 - see. Fig. 6 - running through the loop of the strap, and through the straps of other cushions.
The band may contribute to stabilize different furniture-structures. The band 15 comprises a first band side 16 and an opposite second band side 17 as well as a Velcro fastener 18 such that the first side 16 comprises Velcro hooks 19 and the second side comprises Velcro loops 20.

[0033] Typical dimensions measured in cm. of the cushions 2 of a furniture system are: l_1: 40 l_2: 33, 48, 63 h: 12.
The cushions are typically produced in a foam rubber material such as polyether foam and with the data 25/38, the last mentioned value expresses the hardness.
The foam rubber material is covered with a piece of fabric preferably removable in the colors and with the structure that is desired for both the frame 10 and the module elements 2.

[0034] Fig. 3 shows the closed frame 10 with a rectangular cavity 11 defined by the frame 10 and adapted to receive and fix the module elements 2 in a desired position. The cavity could also be square. The frame 10 comprises a bottom 12 fastened to the lower surfaces 13 of the frame and made in a flexible material such as a fabric, a soft rubber pad or a foam rubber pad. The bottom is a thin flexible material (max 0,5-1 cm). The cavity 11 of the frame 10 is delimited by substantially flat frame-sidewalls 14 where at least one frame-sidewall 14 and the opposite frame-sidewall have a longitudinal extension of l_1
The height h of the frame 10 measured between an upper free surface 22 and an oppositely located lower free surface 13 is arranged to have an abutment to the floor and substantially the same value as the thickness t of the module elements 2. In this case 12 cm. The frame 10 is made of the same material as the cushions 2 and is also coated with a cloth/woven fabric preferably the same as the cushions. For example, several frames 10 can be stacked one above the other so that the furniture's seating space is raised relative to the floor when the bottom 12 is removed. When the bottom is in place it is made in same material.

[0035] Also, several frames 10 can be arranged side by side, enabling the furniture arrangement to be expanded. The frames 10 may be equipped with Velcro such that when stacked or laid side by side, the Velcro will engage and fix each other. The dimensions of the frame in this case are an inside length of 148 cm and an inside

width of 40 cm. The latter corresponds to l_1 of the module elements 2. Internal dimensions are understood to mean that the dimensions are measured in the cavity 11.

[0036] FIG. 4 shows a furniture formed by the modular furniture system 1 comprising two seats formed by the modular furniture system according to the invention. By using high/long module elements/cushions 2 armrests are arranged. The cushions/module elements 2 may be further stabilized by wrapping a belt as described above. However, the frame 10 provides fine fixation when the user is not too heavy. For the same reason, the furniture system is especially suitable for equipping a children's room with children's furniture.

[0037] FIG. 5 shows another piece of furniture comprising two seats and a table formed by the modular furniture system 1 according to the invention. In this case, the frame 10 is pushed up against a wall, which is why a couple of the cushions are laid on the edge of the frame and form a backrest. The backrest could also be provided by having the cushions laid down in the cavity, as it is merely a matter of the dimensions chosen on the cushions in relation to the dimensions of the cavity.

Additional cushions of other dimensions can be purchased for the system. However, the thickness of the cushions should be aligned with the frame preferably having the same height as the frame 10 or higher.

Claims

1. A modular furniture system(1) for providing a wide variety of furniture and comprising a number of modular elements (2), each module element (2) comprises a first substantially flat surface (3) and an opposite placed second surface (4), said two surfaces are connected with side surfaces, a first side-surface (5) having a length l_1 and a height t, an opposite second side-surface having a length l_1 and a height t as well as a third side-surface (7) having a length l_2 and a height t, and an opposite fourth side-surface (8) having a length l_2 and a height t, said surfaces (3,4,5,6,7,8) providing rectangular or square module elements (2),
   the second surface (4) and the side-surfaces (5,6,7,8) are essentially plane, the module elements (2) are provided in a flexible material, and the modular furniture system (1) comprises a frame surrounding a square or rectangular cavity (11) bounded by the frame (10), said frame is configured to receive and fix the module elements (2) in a defined position for providing the furniture **characterized in that** both the frame (10) and the module elements (2) are made in a foam rubber material.

2. A modular furniture system (1) according to claim 1 **characterized in that** the length l_2 is identical or different from the length l_1 and can assume different values between different module elements (2), and the length l_1 assumes the same and a fixed value for all the module elements (2), whereby the module elements (2) among themselves can assume square and/or different dimensioned rectangular shapes.

3. A modular furniture system (1) according to claim 1 or 2 **characterized in that** the furniture system (1) comprises module elements (2), where l_2 of a module element (2) is different from l_2 of another module element (2).

4. A modular furniture system (1) according to claim 1,2 or 3 **characterized in that** the frame (10) comprises a bottom (12) fasten to a lower surface (13) of the frame (10) and provided in a flexible material such as a textile, a foam rubber material or a rubber mat.

5. A modular furniture system (1) according to any one of the preceding claims **characterized in that** the cavity (11) is delimited by the substantially flat frame side walls (14), where to opposite placed first frame side walls has a length extension l_1.

6. A modular furniture system according to claim 5 **characterized in that** two other opposite placed second frame side walls have a length extension larger than l_1.

7. A modular furniture system (1) according to any one of the preceding claims **characterized in that** the height h of the frame measured between an upper surface (22) and an opposite lower surface (13) adapted to turn towards a floor has at least the same value as the height t of the module elements (2).

8. Et modular furniture system (1) according to any one of the preceding claims **characterized in that** the frame (10) comprises four side-beams arranged to provide the square or rectangular frame (10), and the cross-section of each side-beam is square or rectangular and the surrounding four side of the cross-section all have at least a length t equal to the height of a module element (2).

9. A modular furniture system (1) according to any one of the preceding claims **characterized in that** each module element (2) is a cushion/pillow having with a rectangular or square outer circumference.

10. Et modular furniture system (1) according to any one of the preceding claims **characterized in that** the furniture system (1) also includes a flexible band (15) comprising a first band side (16) and an opposite second band side (17) and the band (15) comprises a Velcro fastener (18) such that the first band side (16) comprises Velcro hoops (19) and the second band side (17) comprises Velcro loops (20)

11. A modular furniture system (1) according to any one of the preceding claims **characterized in that** each module element (2) is a pillow/cushion with a rectangular or square outer circumference and that the pillow/cushion comprises a strap placed om at least one side surface (5,6,7,8).

12. A modular furniture system (1) according to any one of the preceding claims **characterized in that** the foam rubber material is a polyether foam or cold foam.

13. A modular furniture system (1) according to any one of the preceding claims **characterized in that** the module elements (2) are covered with woven fabric or canvas, alternatively a leather material and that the frame (10) is covered with the same material as the module elements (2).

14. A modular furniture system (1) according to any one of the preceding claims **characterized in** the bottom (12) is made in the same material and with the same thickness as the material which encloses the foam rubber material of the frame (10).

15. Use of a modular furniture system (1) according to each of the claims 1-14 for providing a furniture comprising at least one of following furniture: a chair, a sofa, a bed, a table or a combination thereof and for use by children.

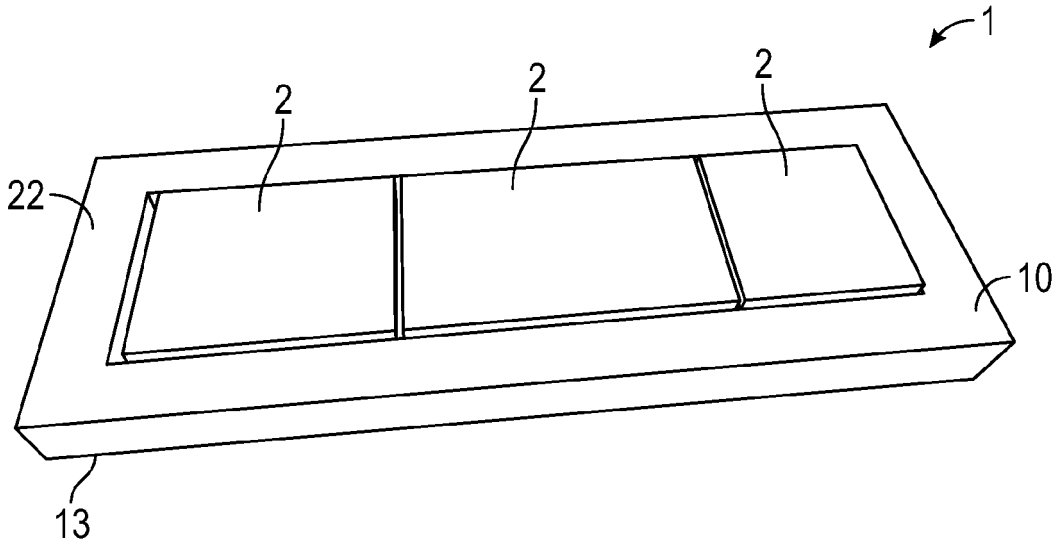

FIG. 1

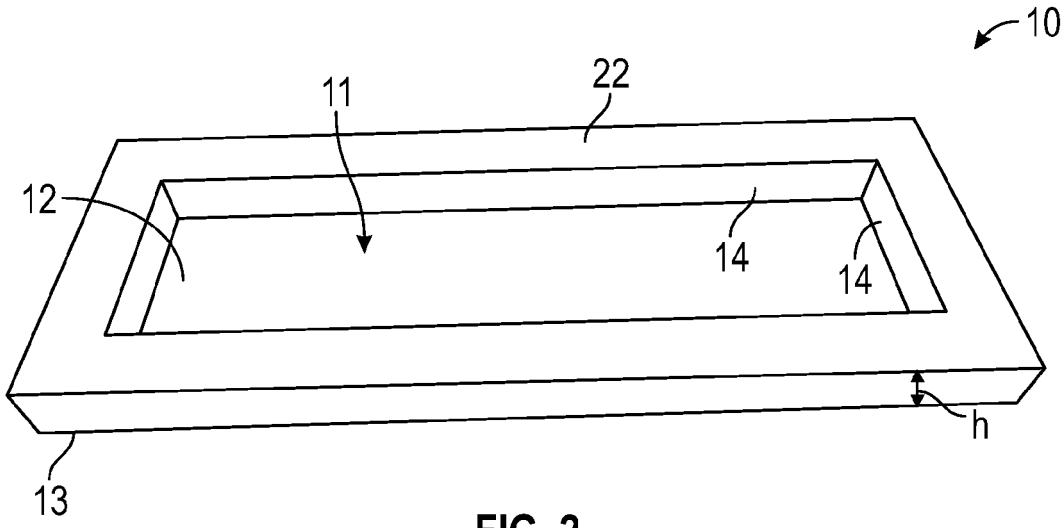

FIG. 2

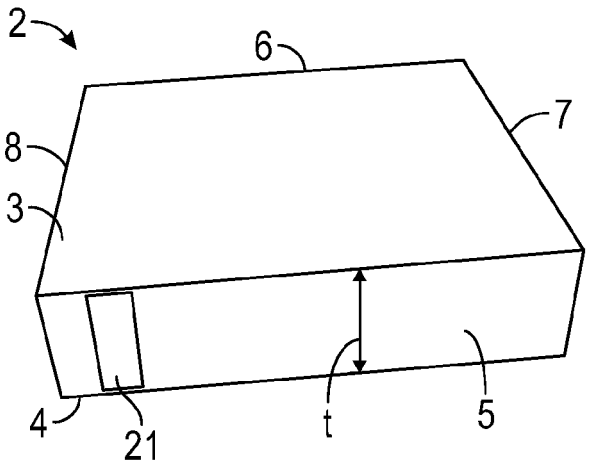

FIG. 3

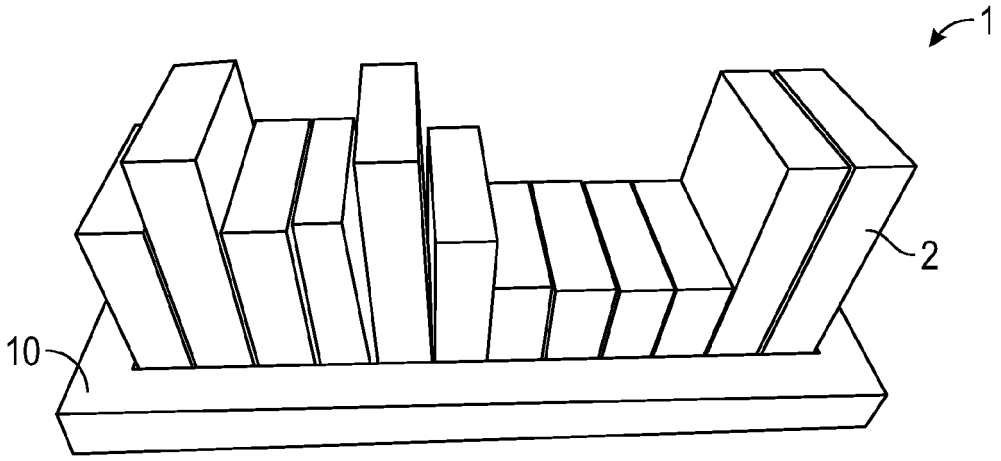

FIG. 4

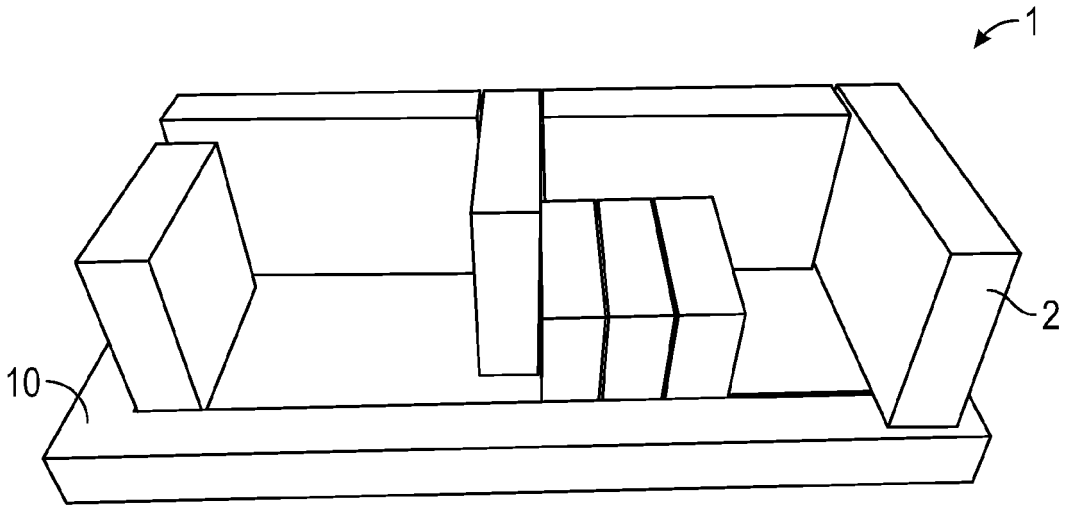

FIG. 5

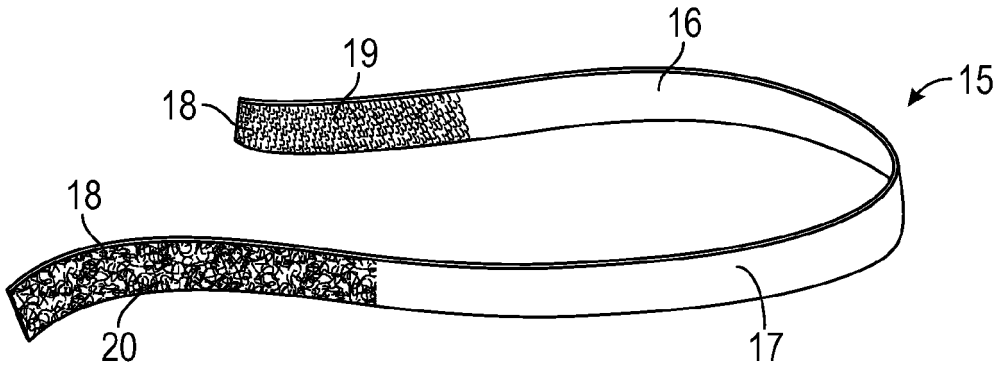

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 20 17 9310

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 A	RU 2 205 585 C1 (MERENDA VLADIMIR IVANOVICH) 10 June 2003 (2003-06-10) * paragraphs [0019], [0037], [0038]; claims 1,7; figures 5-9 * -----	1,2,4-15 3	INV. A47D11/00 A47C13/00 A47C27/14 A47B85/00
X	4layer: "PS13 - 4Block Baby Sofa", , 20 July 2017 (2017-07-20), XP055711522, Retrieved from the Internet: URL:http://toynhi.blogspot.com/p/4layer-baby-block-sofa-series.html [retrieved on 2020-07-03]	1,2, 7-13,15	
A	* the whole document * -----	3	
A	Designskin: "Catalogue 2015/2016 Designskin", , 31 December 2015 (2015-12-31), XP055711519, Retrieved from the Internet: URL:https://designskin.ch/img/Catalogue_Designskin_FR_2015_2016.pdf [retrieved on 2020-07-03] * pages 5,8 * -----	12,13,15	

TECHNICAL FIELDS SEARCHED (IPC)

A47D
A47C
A47B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	3 July 2020	Pössinger, Tobias

CATEGORY OF CITED DOCUMENTS

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
RU 2205585 C1	10-06-2003	NONE	

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

REFERENCES CITED IN THE DESCRIPTION

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- DK 9300433 U4 **[0005]**
- US 3817573 A **[0006]**