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- (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG,

MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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(54) **Title:** CLIP FOR SUSPENDED CEILING MEMBERS

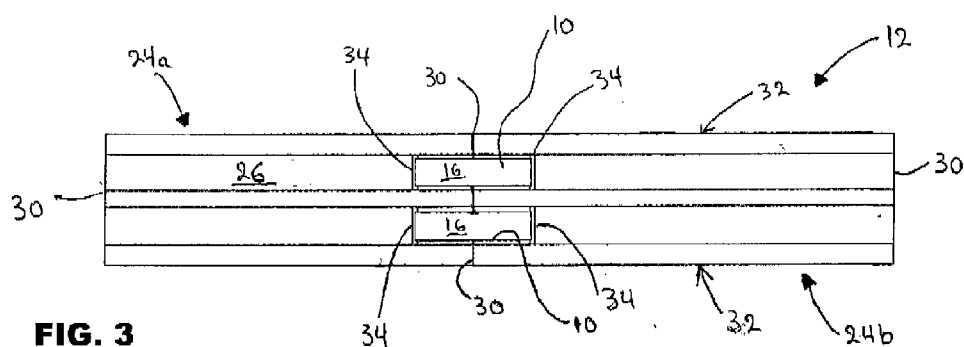


FIG. 3

(57) **Abstract:** A clip for a suspended ceiling being suspended from an overhead structure has at least first and second adjoining ceiling members defining a top surface interfacing with the overhead structure and an opposite undersurface. The top surface of each of the first and second adjoining ceiling members defines at least one slot. The clip comprises a main longitudinal body and a pair of inserts. The main longitudinal body defines opposite ends. Each of the inserts downwardly extend from respective one of the ends of the longitudinal body. Each of the inserts configured to be inserted into a respective one of the slots. The clip is mountable to the first and second adjoining ceiling members with one insert being inserted in the slot of the first ceiling member and the other insert being inserted in the slot of the second ceiling member thereby maintaining the first and second ceiling members in the adjoining position against separation.



TITLE**CLIP FOR SUSPENDED CEILING MEMBERS****CROSS-REFERENCE TO RELATED APPLICATIONS**

- 5 [0001] The present application claims priority on United States Provisional Patent Application No. 62/327,533 filed on April 26, 2016 and incorporated herein by reference in its entirety.

TECHNICAL FIELD

- 10 [0002] The present disclosure generally relates to suspended ceilings. More particularly but not exclusively, the present disclosure relates to a clip for suspended ceiling members.

BACKGROUND

- 15 [0003] Suspended ceilings are secondary ceiling that are suspended from an overhead structure. Suspended ceilings include suspended ceiling members such as runners, cross members and panels. These ceiling members have a top side surface that interface with the overhead structure and an opposite underside surface. Usually, suspended ceiling are made of a metal grid consisting of tracks in the form of longitudinal parallel runners spaced apart from one another at a desired distance and separated by cross members in a perpendicular fashion thereby creating a plurality of rectangular openings for receiving rectangular panels. In general, those
20 rectangular openings are of standard sizes allowing the ventilation outlets and the lighting fixtures to be easily inserted among the ceiling panels.

OBJECTS

[0004] An object of the present disclosure is to provide a clip for suspended ceiling members.

[0005] An object of the present disclosure is to provide a suspended ceiling comprising clip for the ceiling members thereof.

[0006] An object of the present disclosure is to provide a kit for a suspended ceiling comprising ceiling members and a clip therefor.

[0007] A method of constructing a suspended ceiling.

SUMMARY

[0008] In accordance with an aspect of the disclosure, there is provided a clip for a suspended ceiling being suspended from an overhead structure and having at least first and second adjoined ceiling members defining a top surface interfacing with the overhead structure and an opposite undersurface, the top surface of each of the first and second adjoined ceiling members defining at least one slot, the clip comprising: a main longitudinal body defining opposite ends; and a pair of inserts, each of the inserts downwardly extending from respective one of the ends of the longitudinal body, each of the inserts configured to be inserted into a respective one of the slots, wherein the clip is mountable to the first and second adjoined ceiling members with one insert being inserted in the slot of the first ceiling member and the other insert being inserted in the slot of the second ceiling member thereby maintaining the first and second ceiling members in the adjoined position against separation.

[0009] In accordance with an aspect of the disclosure, there is provided a suspended ceiling for being suspended from an overhead structure, the suspended ceiling comprising: at least first and second adjoined ceiling members defining a top surface interfacing with the overhead structure and an opposite undersurface, the top surface of each of the first and second adjoined ceiling members defining at least one slot; a clip comprising a main longitudinal body defining opposite ends and a pair of inserts, each of the inserts downwardly extending from respective one of the ends of the longitudinal body, each of the inserts configured to be inserted into a respective one of the slots, wherein the clip is mountable to the first and second adjoined ceiling members with one insert being inserted in the slot of the first ceiling member and the other insert being inserted in the slot of the second ceiling member thereby maintaining the first and second ceiling members in the adjoined position against separation.

[0010] In accordance with an aspect of the disclosure, there is provided a kit for a suspended ceiling for being suspended from an overhead structure, the kit comprising: at least first and second adjoined ceiling members defining a top surface interfacing with the overhead structure and an opposite undersurface, the top surface of each of the first and second adjoined ceiling members defining at least one slot; a clip comprising a main longitudinal body defining opposite ends and a pair of inserts, each of the inserts downwardly extending from respective one of the ends of the longitudinal body, each of the inserts configured to be inserted into a respective one of the slots, wherein the clip is mountable to the first and second adjoined ceiling members with one insert being inserted in the slot of the first ceiling member and the other insert being inserted in the slot of the second ceiling member thereby maintaining the first and second ceiling members in the adjoined position against separation.

[0011] In an embodiment, each of the inserts forms an acute angle with the main longitudinal body, each slot comprising a corresponding angular configuration.

[0012] In an embodiment, the main longitudinal body is a flat member.

[0013] In an embodiment, the clip further comprises flexible and resilient
5 material.

[0014] In an embodiment, each of the insert defines with the main longitudinal body a respective corner portion therebetween. In an embodiment, each of the corner portions comprises a flexible and resilient material.

[0015] In an embodiment, each insert is a separate piece mountable to the
10 main longitudinal body.

[0016] In an embodiment, the main longitudinal body is modular. In an embodiment, the modular longitudinal body comprises at least two pieces which are connectable.

[0017] In accordance with an aspect of the disclosure, there is provided a
15 method of constructing a suspended ceiling for being suspended from an overhead structure, the method comprising: providing at least first and second ceiling members defining a top surface interfacing with the overhead structure and an opposite undersurface, adjoining the first and second ceiling members; providing at least one slot on the top surface of each of the first and second adjoining ceiling members;
20 providing a clip comprising a main longitudinal body defining opposite ends and a pair of inserts, each of the inserts downwardly extending from respective one of the ends of the longitudinal body, each of the inserts configured to be inserted into a respective one of the slots; and mounting the clip to the first and second adjoining

ceiling members by inserting one insert in the slot of the first ceiling member and the inserting the other insert in the slot of the second ceiling member thereby maintaining the first and second ceiling members in the adjoined position against separation.

[0018] In an embodiment, the method further comprises varying the length of
5 the main longitudinal body.

[0019] Other objects, advantages and features of the present disclosure will become more apparent upon reading of the following non-restrictive description of illustrative embodiments thereof, given by way of example only with reference to the accompanying drawings.

10 **BRIEF DESCRIPTION OF THE FIGURES**

[0020] Figure 1 is a lateral side view of the clip for the ceiling members of a suspended ceiling in accordance with a non-restrictive illustrative embodiment thereof;

[0021] Figure 2 is an underside view of the clip of Figure 1;

15 **[0022]** Figure 3 is a top plan view of suspended ceiling structure having adjoined ceiling members positioned end to end and connected by a pair of the clips of Figure 1 in accordance with a non-restrictive illustrative embodiment thereof;

[0023] Figure 4 is a lateral sectional view of Figure 1 taken along line 4-4 thereof;

20 **[0024]** Figure 5 is a top plan view of a suspended ceiling structure having adjoined ceiling members perpendicularly positioned thereof to each other in accordance with a non-restrictive illustrative embodiment thereof;

[0025] Figure 6 is a lateral side view of the suspended ceiling structure of Figure 5 having the clip of Figure mounted to the ceiling members thereof;

[0026] Figure 7 is a side view of a disassembled modular clip for the ceiling members of a suspended ceiling in accordance with another non-restrictive illustrative embodiment thereof;

[0027] Figure 8 is a side view of one component and a bottom view of another component of the modular clip of Figure 7;

[0028] Figure 9 is a side view of a disassembled modular clip for the ceiling members of a suspended ceiling in accordance with a further non-restrictive illustrative embodiment thereof; and

[0029] Figure 10 is bottom view of the modular clip of Figure 9.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0030] Generally stated and in accordance with a non-restrictive illustrative embodiment, there is provided a clip for a suspended ceiling being suspended from an overhead structure having at least first and second adjoined ceiling members defining a top surface interfacing with the overhead structure and an opposite undersurface. The top surface of each of the first and second adjoined ceiling members defines at least one slot. The clip comprises a main longitudinal body and a pair of inserts. The main longitudinal body defines opposite ends. Each of the inserts downwardly extend from respective one of the ends of the longitudinal body. Each of the inserts configured to be inserted into a respective one of the slots. The clip is mountable to the first and second adjoined ceiling members with one insert being inserted in the slot of the first ceiling member and the other insert being

inserted in the slot of the second ceiling member thereby maintaining the first and second ceiling members in the adjoined position against separation.

[0031] With reference to the Figures, non-limiting illustrative embodiments will now be described.

5 **[0032]** Figures 1 and 2 show a clip 10 for ceiling members of a suspended ceiling structure 12 (shown in Figures 3 and 4) or suspended ceiling structure 12' (shown in Figures 5 and 6) that is suspended from an overhead structure (not shown).

10 **[0033]** The clip 10 includes a main longitudinal body 14 defining a top side 16 and an opposite underside 18 as well as two opposite ends 20a and 20b. The clip 10 includes a pair of inserts 22a and 22b. Each insert 22a and 22b downwardly extends from a respective end 20a and 20b. Respective corner portions C are defined between each insert 22a, 22b and the main longitudinal body 14.

15 **[0034]** The clip 10 is made of a strong, flexible and resilient material in order to maintain the ceiling members of the suspended ceiling structures 12 and 12' in position against separation as will be described herein.

[0035] Turning to Figures 3 and 4, a pair of clips 10 are shown to be mounted to adjoined first and second ceiling members 24a and 24b, respectively.

20 **[0036]** Each of the ceiling members 24a and 24b defines a top side surface 26 that interfaces with the overhead structure (now shown) and an opposite underside surface 28. The ceiling members 24a and 24b are longitudinal structures defining

respective and opposite longitudinal ends 30 as well as opposite lateral sides 32. The top side surface 26 of each of the ceiling members 24a and 24b includes at least one slot 34. Each slot 34 is configured to receiving one of the inserts 22a or 22b. As such, each insert 22a or 22b is configured to be inserted within a given slot 34.

- 5 **[0037]** When the ceiling members 24a and 24b are adjoined end 30 to end 30, the clip 10 is mounted on the respective top surfaces 26 of the ceiling members 24a and 24b about the junction J thereof with the underside 18 of the main longitudinal body 14 interfacing with the top surfaces 26 of the ceiling members and the junction J. The underside 18 can be spaced apart from the top surfaces 26 or engage them.
- 10 The longitudinal body 14 of the clip 10 extends from the slot 34 of the first ceiling member 24a to the slot 34 of the second ceiling member 24b. The first insert 22a is inserted within the slot 34 of the first ceiling member 24a. The second insert 22b is inserted within the slot 34 of the second ceiling member 24b. The slots 34 are defined by spaced apart walls 36 (see Figure 4). In an embodiment, each insert 22a
- 15 and 22b engages the wall 36 that is proximal to the junction J of the respective slot 34 they are inserted in. As such, the clip 10, clips therebetween a portion of the first and second ceiling member 24a and 24b maintaining the ceiling members together against separation about the junction J.

- [0038]** Turning back to Figure 1, in an embodiment, each insert 22a and 22b
- 20 forms a respective acute angle α with the underside 18 of the longitudinal body 14. In this way, the clip 10 inwardly grips the walls 36 of the first and second ceiling members 24a and 24b. When the members 24a and 24b are slightly moved away from each other during assembly or due to other factors such as humidity, the inserts 22a and 22b are moved against their angular direction increasing the stress applied

on the walls 36 at each side of the junction J to maintain the adjoined ceiling members 24a and 24b in position against separation.

[0039] Turning now to Figures 5 and 6, there is shown a suspended ceiling structure 12' including first and second ceiling members 24a' and 24b' adjoined together in a perpendicular relationship relative to each other. The first ceiling member 24a' is abutted on its lateral side 32' by the longitudinal end 30' of the second ceiling member 24b' and a junction J'. The abutting lateral side 32' of the first ceiling member 24a' and the abutting end 30' of the second ceiling member 24b' have a complementary configurations, wherein a protruding upper portion 40' of end 30' sits on a protruding lower portion 42' of later side 32'.

[0040] Like ceiling members 24a and 24b described above, the second ceiling member 24b' also include at least one respective slot 34' formed on its top side surface 26'. The first ceiling member 24a' also includes a slot 35' on its top side surface 26'. In an embodiment, the slot 35' can also receiving a clip assembly (not shown) for mounting the first ceiling member 24a' to the overhead structure (now shown). In an embodiment, the slot 35' has a dovetail configuration. Of course, other suitable configurations can also be contemplated.

[0041] The clips 10 are mounted on the top surfaces of the ceiling members in the overhead area (the area above the suspended ceiling beneath the overhead structure), as such these removable clips 10 can maintain adjoined ceiling members in position against separation all the while not disturbing the aesthetic appearance of the suspended ceilings.

[0042] The clips 10 may be provided as separate elements or in kits along with the ceiling members.

[0043] Figures 7 and 8 show a modular clip 100, where the main longitudinal body 102 is modular and comprises separate body components, namely end body components 104a and 104b and median body components 106a and 106b. In an embodiment, the clip 100 includes a greater or lesser number of median body components 106a or 106b.

[0044] The end body components 104a and 104b comprise respective underside surfaces 108a and 108b and respective top surfaces 110a and 110. Each body component 104a and 104b defines respective ends 112a and 112b connected to respective inserts 114a and 114b and respective opposite free ends 113a and 113b.

[0045] A given median body component 106a or 106b defines top and underside surfaces 116 and 118, respectively, as well as first and second ends 120 and 122, respectively. The terms "first" and "second" are used here for indicative purposes only and thus are interchangeable.

[0046] The body components are connected together via teeth or hook elements 124 of one body component being inserted into the corresponding apertures 126 of another body component. Of course, other connecting elements for varying the length of the modular longitudinal body 102 can be contemplated by the skilled artisan within the scope of the description.

[0047] Turning now to Figures 9 and 10, there is shown a clip 200 comprising a main longitudinal body 202 and a pair of separate end body components 204a and 204b mountable thereto.

[0048] The main longitudinal body 202 defines top and underside surfaces 205 and 206 respectively and opposite ends 208 and 210 as well as apertures 212 near each end, 208 and 210.

[0049] Each separate body component, 204a and 204b defines an end top portions 214 defining a free end 216 with an insert 218 connected thereto as well as top and underside surfaces, 220 and 222 respectively. The top portion 214 includes teeth or hook elements 224 protruding from the underside surface 222 near the free end 216. The teeth or hooks 224 are fitted within the apertures 212 for connecting the end body components 204a and 204b to the main longitudinal body 202.

[0050] The present disclosure is also drawn to suspended ceilings including the clips and ceiling members disclosed herein as well as methods of constructing suspended ceilings with the clips and ceiling members disclosed herein.

[0051] The clips and ceiling members of the present disclosure may be provided in a variety of suitable shapes and sizes that are convenient to use as described herein and may be made of a variety of suitable materials.

[0052] The various features described herein can be combined in a variety of ways within the context of the disclosure so as to provide still other embodiments. It is to be understood that the disclosure is not limited in its application to the details of construction and parts illustrated in the accompanying drawings and described

hereinabove. The disclosure is capable of other embodiments and of being practiced in various ways. It is also to be understood that the phraseology or terminology used herein is for the purpose of description and not limitation. Hence, although the present disclosure has been provided hereinabove by way of non-restrictive
5 illustrative embodiments thereof, it can be modified, without departing from the scope, spirit and nature of the disclosure and appended claims

WHAT IS CLAIMED IS:

1. A clip for a suspended ceiling being suspended from an overhead structure and having at least first and second adjoined ceiling members defining a top surface interfacing with the overhead structure and an opposite undersurface, the top surface of each of the first and second adjoined ceiling members defining at least one slot, the clip comprising:
- 5
- a main longitudinal body defining opposite ends; and
 - a pair of inserts, each of the inserts downwardly extending from respective one of the ends of the longitudinal body, each of the inserts configured to
- 10 be inserted into a respective one of the slots,
- wherein the clip is mountable to the first and second adjoined ceiling members with one insert being inserted in the slot of the first ceiling member and the other insert being inserted in the slot of the second ceiling member thereby maintaining the first and second ceiling members in the adjoined position against
- 15 separation.
2. A clip according to claim 1, wherein each of the inserts forms an acute angle with the main longitudinal body, each slot comprising a corresponding angular configuration.
- 20
3. A clip according to any one of claims 1 or 2, wherein the main longitudinal body is a flat member.
4. A clip according to any one of claims 1 to 3, wherein the clip
- 25 further comprises flexible and resilient material.

5. A clip according to any one of claims 1 to 4, wherein each of the insert defines with the main longitudinal body a respective corner portion therebetween.

5

6. A clip according to claim 5, wherein each of the corner portions comprises a flexible and resilient material.

10

7. A clip according to any one of claims 1 to 6, wherein each insert is a separate piece mountable to the main longitudinal body.

8. A clip according to any one of claims 1 to 7, wherein the main longitudinal body is modular.

15

9. A clip according to claim 8, wherein the modular longitudinal body comprises at least two pieces which are connectable.

20

10. A suspended ceiling for being suspended from an overhead structure, the suspended ceiling comprising:

at least first and second adjoined ceiling members defining a top surface interfacing with the overhead structure and an opposite undersurface, the top surface of each of the first and second adjoined ceiling members defining at least one slot;

25

a clip comprising a main longitudinal body defining opposite ends and a pair of inserts, each of the inserts downwardly extending from respective one of the ends of the longitudinal body, each of the inserts configured to be inserted into

a respective one of the slots,

wherein the clip is mountable to the first and second adjoined ceiling members with one insert being inserted in the slot of the first ceiling member and the other insert being inserted in the slot of the second ceiling member thereby
5 maintaining the first and second ceiling members in the adjoined position against separation.

11. A suspended ceiling according to claim 1, wherein each of the inserts forms an acute angle with the main longitudinal body, each slot comprising a
10 corresponding angular configuration.

12. A suspended ceiling according to any one of claims 10 or 11, wherein the main longitudinal body is a flat member.

13. A suspended ceiling according to any one of claims 10 to 13, wherein the clip further comprises flexible and resilient material.
15

14. A suspended ceiling according to any one of claims 10 to 13, wherein each of the insert defines with the main longitudinal body a respective corner
20 portion therebetween.

15. A suspended ceiling according to claim 14, wherein each of the corner portions comprises a flexible and resilient material.

16. A suspended ceiling according to any one of claims 1 to 15, wherein each insert is a separate piece mountable to the main longitudinal body.
25

17. A suspended ceiling according to any one of claims 1 to 16, wherein the main longitudinal body is modular.

5 18. A suspended ceiling according to claim 17, wherein the modular longitudinal body comprises at least two pieces which are connectable.

19. A kit for a suspended ceiling for being suspended from an overhead structure, the kit comprising:

10 at least first and second adjoined ceiling members defining a top surface interfacing with the overhead structure and an opposite undersurface, the top surface of each of the first and second adjoined ceiling members defining at least one slot;

15 a clip comprising a main longitudinal body defining opposite ends and a pair of inserts, each of the inserts downwardly extending from respective one of the ends of the longitudinal body, each of the inserts configured to be inserted into a respective one of the slots,

20 wherein the clip is mountable to the first and second adjoined ceiling members with one insert being inserted in the slot of the first ceiling member and the other insert being inserted in the slot of the second ceiling member thereby maintaining the first and second ceiling members in the adjoined position against separation.

25 20. A kit according to claim 19, wherein each of the inserts forms an acute angle with the main longitudinal body, each slot comprising a corresponding angular configuration.

21. A kit according to any one of claims 19 or 20, wherein the main longitudinal body is a flat member.

5 22. A kit according to any one of claims 19 to 21, wherein the clip further comprises flexible and resilient material.

10 23. A kit according to any one of claims 19 to 22, wherein each of the insert defines with the main longitudinal body a respective corner portion therebetween.

24. A kit according to claim 23, wherein each of the corner portions comprises a flexible and resilient material.

15 25. A kit according to any one of claims 19 to 24, wherein each insert is a separate piece mountable to the main longitudinal body.

20 26. A kit according to any one of claims 19 to 25, wherein the main longitudinal body is modular.

27. A kit according to claim 26, wherein the modular longitudinal body comprises at least two pieces which are connectable.

25 28. A kit according to any one of claims 19 to 27, wherein at least one of the first or second adjoined ceiling members is selected from the group consisting of a panel, a runner, a cross-member and combinations thereof.

29. A kit according to any one of claims 19 to 28, further comprising a plurality of the first and second adjoined ceiling members and a plurality of the clips.

5

30. A method of constructing a suspended ceiling for being suspended from an overhead structure, the method comprising:

10 providing at least first and second ceiling members defining a top surface interfacing with the overhead structure and an opposite undersurface, adjoining the first and second ceiling members;

providing at least one slot on the top surface of each of the first and second adjoined ceiling members;

15 providing a clip comprising a main longitudinal body defining opposite ends and a pair of inserts, each of the inserts downwardly extending from respective one of the ends of the longitudinal body, each of the inserts configured to be inserted into a respective one of the slots; and

20 mounting the clip to the first and second adjoined ceiling members by inserting one insert in the slot of the first ceiling member and the inserting the other insert in the slot of the second ceiling member thereby maintaining the first and second ceiling members in the adjoined position against separation.

31. A method according to claim 30, further comprising varying the length of the main longitudinal body.

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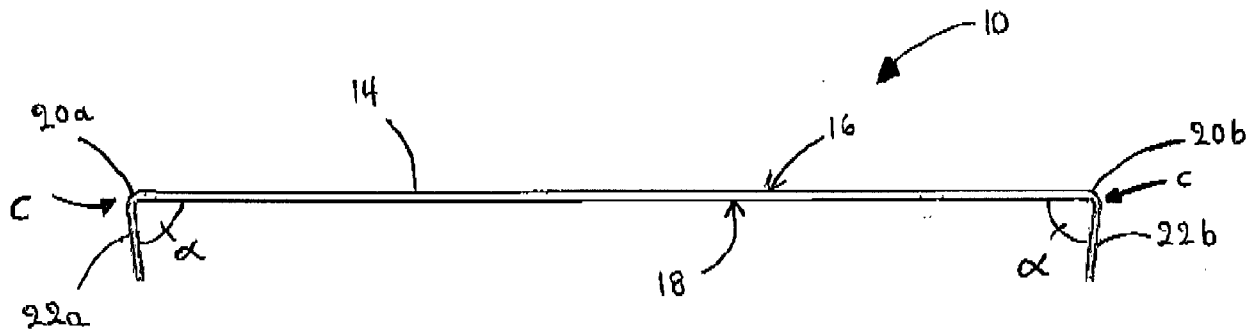


FIG. 1

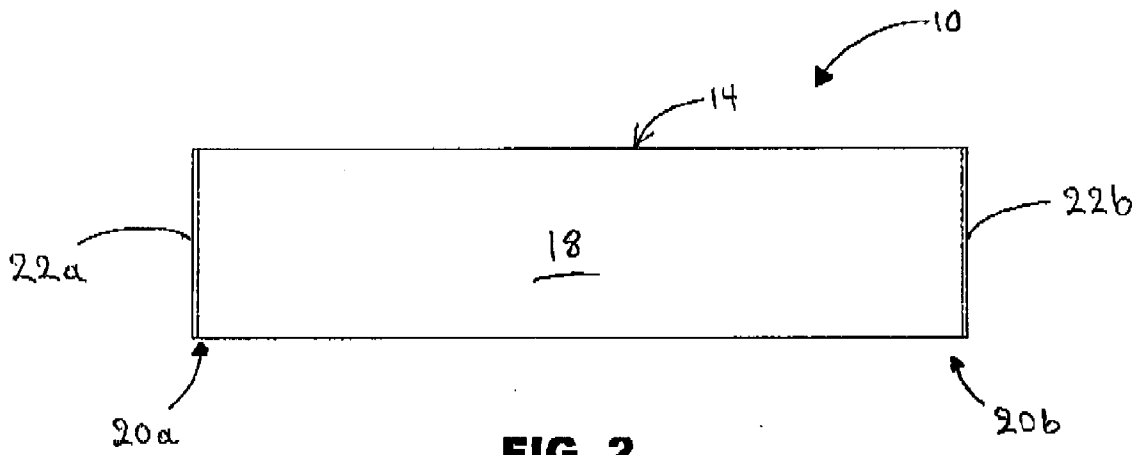


FIG. 2

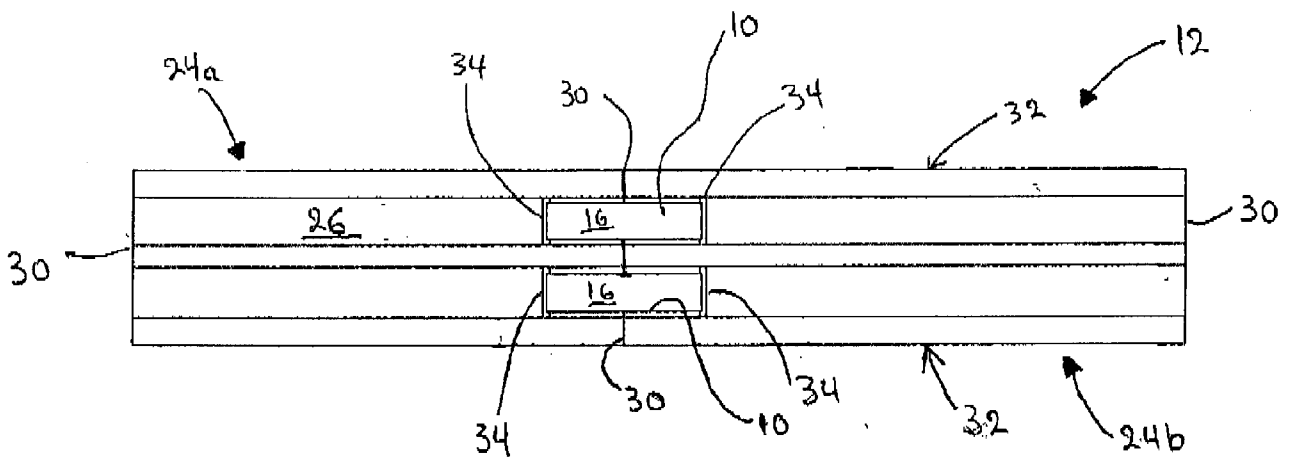
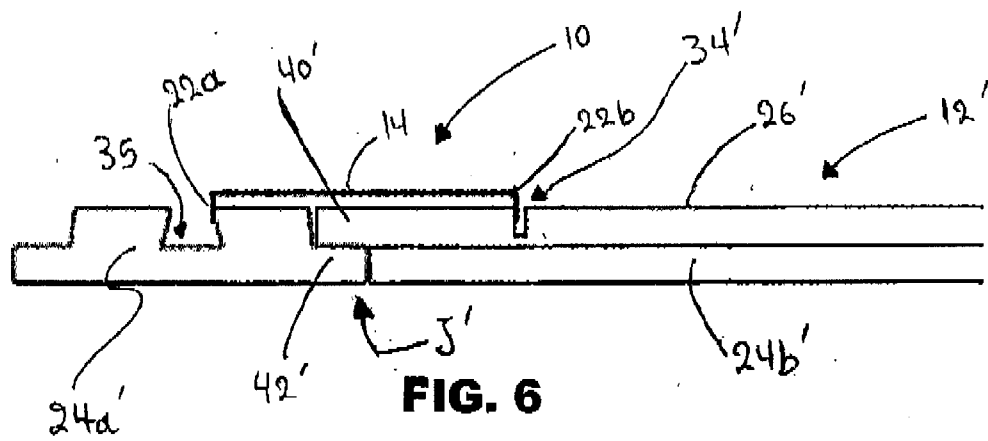
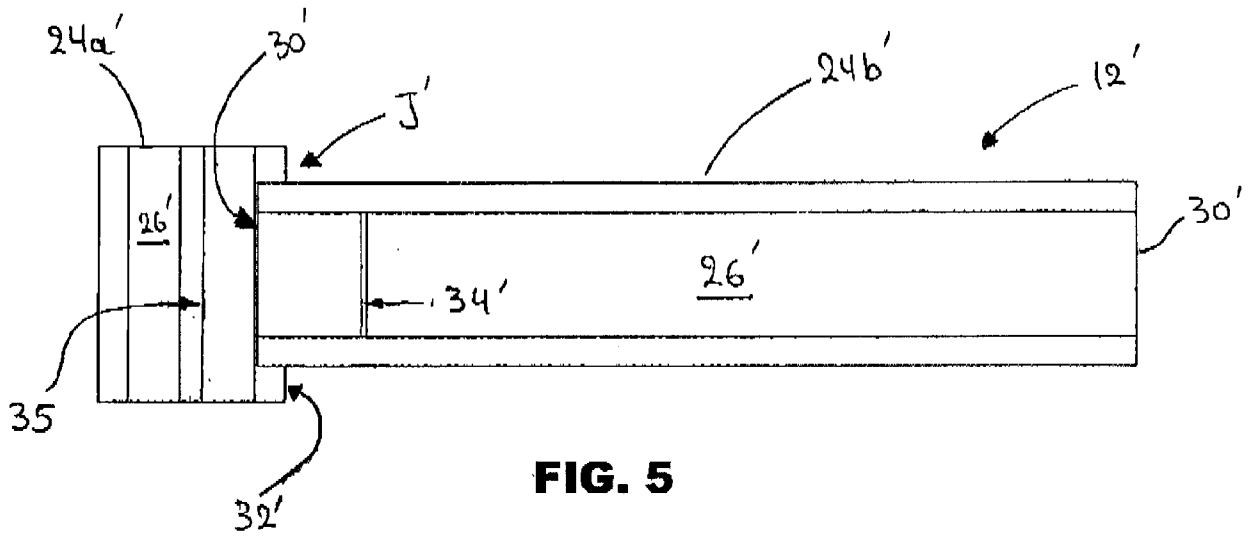
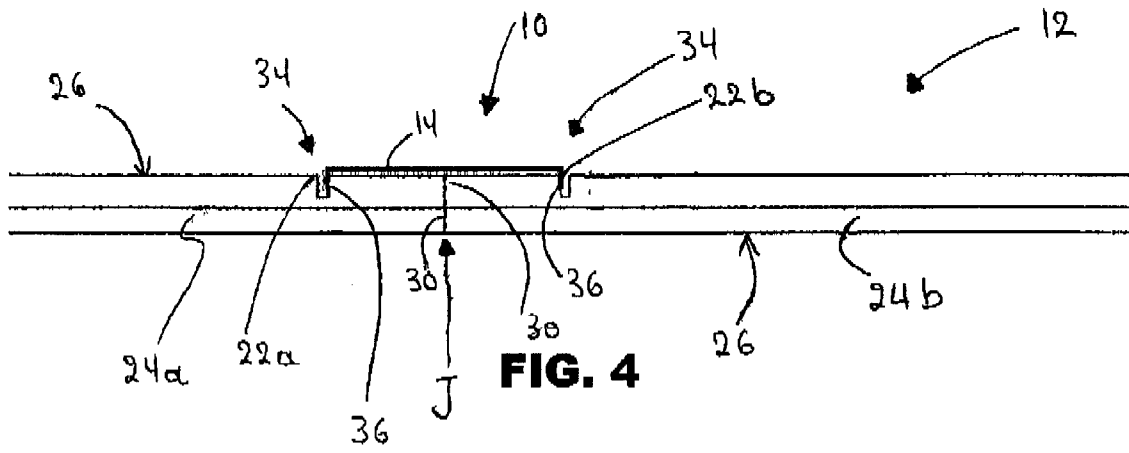


FIG. 3



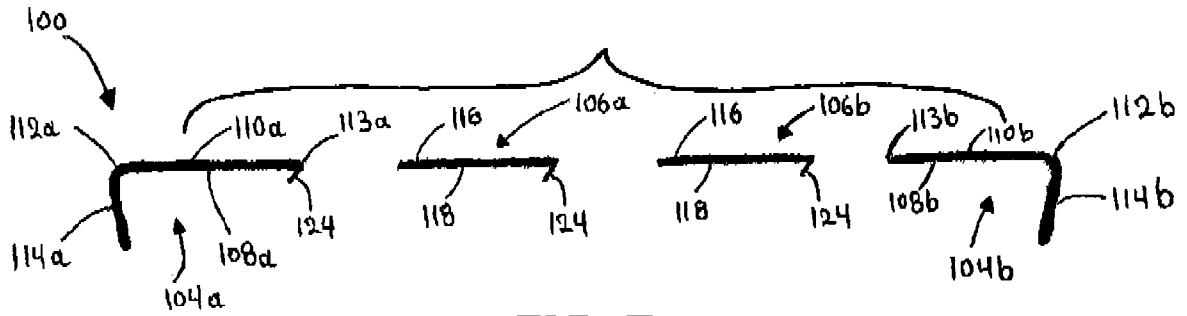


FIG. 7

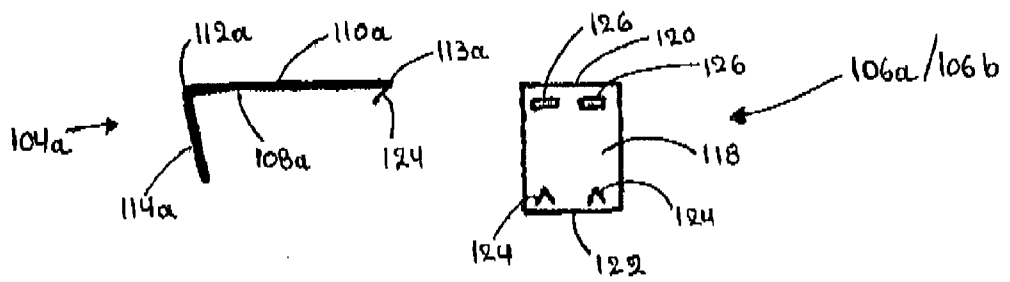


FIG. 8

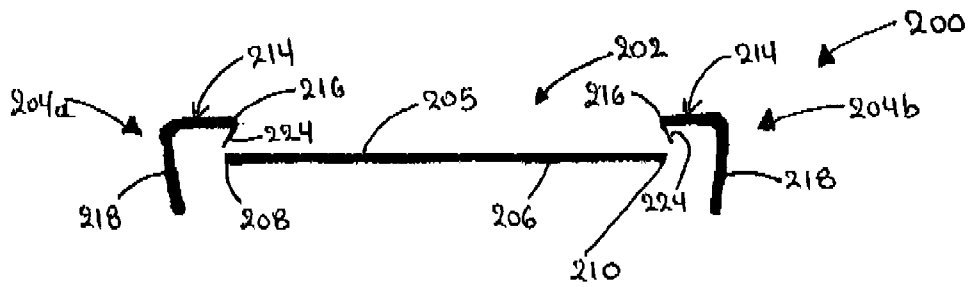


FIG. 9

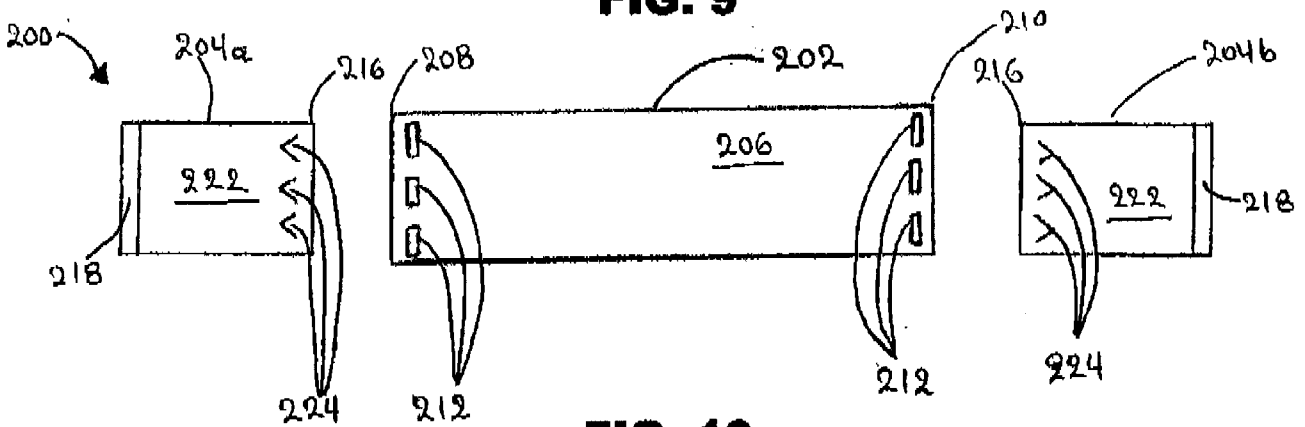


FIG. 10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CA2017/000099

A. CLASSIFICATION OF SUBJECT MATTER
IPC: **E04B 9/22** (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC: E04B 9/22, E04F-015, E04B-001

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
None

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)
Questel-Orbit Google
Key words: (clip OR clamp OR catch OR clasp OR fastener OR lock+), insert+, (join+ OR connect+ OR interfac+ OR adjoin+ OR link+), (panel+ OR sheet+ OR member+ OR tile), (notch OR groove OR slot), (snap OR spring OR flexible)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	EP1120515A1 DeKerpel, J. et al 01 August 2001 (01-08-2001) (see paragraphs [0001], [0005], [0009], [0012], [0015], [0016] and [0019]; along with fig. 1a)	1, 3, 10, 12, 19, 21 and 27 to 31 2, 4 to 6, 11, 13 to 15, 20 and 22 to 24
X Y	US20070107359A1 Zhang, W. 17 May 2007 (17-05-2007) (see paragraphs [0006], [0023], [0047] to [0052] and [0072], along with figs. 1 to 3)	1,3, 10, 12, 19, 21 and 27 to 31 2, 4 to 6, 11, 13 to 15, 20 and 22 to 24
Y	CA1230726 LaVanture, A. 29 December 1987 (29-12-1987) (see pg. 2, lines 5 to 21; pg. 5, line 25 to pg. 6, line 32; and pg. 7, line 19 to pg. 8, line 27; along with figs. 1 to 2B and 4)	2, 4 to 6, 11, 13 to 15, 20 and 22 to 24

Further documents are listed in the continuation of Box C.

See patent family annex.

* "A" "E" "L" "O" "P"	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance earlier application or patent but published on or after the international filing date document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) document referring to an oral disclosure, use, exhibition or other means document published prior to the international filing date but later than the priority date claimed	"T" "X" "Y" "&"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art document member of the same patent family
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Date of the actual completion of the international search
03 August 2017 (03-08-2017)

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16 August 2017 (16-08-2017)

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CA2017/000099

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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO2012159162A1 Kell, R. 29 November 2012 (29-11-2012) (see entire document, especially figs. 1a to 1c)	1 to 6, 10 to 15, 19 to 24 and 30
A	US8763340B2 Pervan et al. 1 July 2014 (01-07-2014) (see entire document, especially figs. 1a to 1c)	1 to 6, 10 to 15, 19 to 24 and 30

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
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