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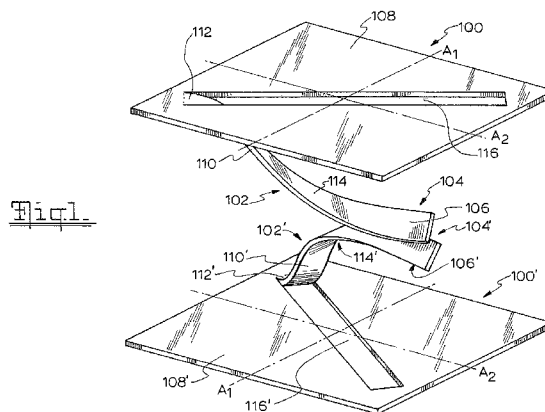
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(57) Abstract: Fasteners are generally described. In some examples, a fastener may include at least one hook. The at least one hook may include an arcuate portion and a linking portion. The arcuate portion may be connected by the linking portion to a pivot point. The pivot point may be located with respect to the first member so that, as the linking portion pivots around the pivot point, the arcuate portion moves along an arcuate path between a non-fastening position and a fastening position. In the fastening position the arcuate portion may extend beyond the first member to engage with the second member to secure it to the first member.

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HOOK-TO-HOOK RELEASABLE FASTENER**BACKGROUND**

[0001] Unless otherwise indicated herein, the materials described in this section are not prior art to the claims in this application and are not admitted to be prior art by inclusion in this section.

[0002] In prefabricated buildings, components such as internal walls, cabinetry, shelves, fixtures, fittings, etc are erected and fastened together on site, and may be uncoupled for internal space reorganization, for alternative use of space, or for deconstruction and removal of the building.

[0003] Permanent fasteners can hinder the uncoupling of components and deconstruction of the building. Also, the use of permanent fasteners may result in the components becoming damaged, requiring repair or replacement.

[0004] Hook and loop fasteners require that at least one of the underlying substrates for either the hook portion or the loop portion of the fastener be flexible, to enable one such portion to be peeled away and detached from the other.

SUMMARY

[0005] In some embodiments, a fastener component is generally described. An example fastener component may be mounted with respect to a first member to enable the first member to be coupled to a like fastener component. The like fastener component may be mounted with respect to a second member. Each of the fastener component and like fastener component may comprise at least one projecting hook. A distal part of the at least one hook may comprise a generally planar part that faces back generally towards a remainder of the fastener component. The planar part of the at least one hook of the fastener component may be positioned to face a planar part of a hook of the like fastener component whereby coupling of the fastener components can occur.

[0006] The foregoing summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects, embodiments, and features described above, further aspects, embodiments, and features will become apparent by reference to the drawings and the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] In the drawings:

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FIGURE 1 shows a diagrammatic perspective view of an example fastener component in the form of a single hook unit, being positioned in relation to another example fastener component in the form of a single hook unit;

FIGURE 1A shows a diagrammatic perspective view of the example fastener components of

5 **Figure 1**, being positioned in relation to first and second parts A and B;

FIGURE 2 shows a diagrammatic perspective view of an example fastener component in the form of a double hook unit, being positioned in relation to another example fastener component in the form of a double hook unit;

10 **FIGURE 3** shows a diagrammatic perspective view of an example fastener component in the form of a multiple hook unit, being positioned in relation to another example fastener component in the form of a multiple hook unit; and

FIGURES 4A to 4C show diagrammatic perspective views of example cleaving tools for use in separating coupled hooks of respective fastener components;

all arranged according to at least some embodiments described herein.

15 **DETAILED DESCRIPTION**

[0008] In the following detailed description, reference is made to the accompanying drawings, which form a part hereof. In the drawings, similar symbols typically identify similar components, unless context dictates otherwise. The illustrative embodiments described in the detailed description, drawings, and claims are not meant to be limiting. Other embodiments may be utilized, and other
20 changes may be made, without departing from the spirit or scope of the subject matter presented herein. It will be readily understood that the aspects of the present disclosure, as generally described herein, and illustrated in the Figures, can be arranged, substituted, combined, separated, and designed in a wide variety of different configurations, all of which are explicitly contemplated herein.

[0009] This disclosure is generally directed, *inter alia*, to apparatus, methods, systems and
25 members that employ fastener components for securing a first member to a second member (e.g. a first part to a second part).

[0010] Briefly stated a fastener component is generally disclosed. An example first fastener component can be mounted to a first member and an example second fastener component can be mounted to a second member. The fastener components can enable the first and second members to be
30 releasably secured together. Each of the example fastener components may comprise at least one projecting hook. A distal part of the at least one hook may comprise a generally planar part that faces back generally towards a remainder of the fastener component. The planar part of the at least one hook

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of the first fastener component may be positioned to face a planar part of a hook of the second fastener component whereby coupling of the fastener components can occur. When the example first fastener component is mounted to the first member and the example second fastener component is mounted to the second member, the coupling of the fastener components can function to releasably secure the first and second members.

[0011] Figure 1 is a diagrammatic perspective representation of an example first fastener component 100, and an example second fastener component 100', which are arranged according to at least some embodiments described herein. In Figure 1 the example fastener components 100, 100' are about to be brought into a coupling position, whereupon they become coupled to each other.

[0012] Figure 1A is a diagrammatic perspective representation of the example first and second fastener components 100, 100' of Figure 1 respectively being positioned (e.g. mounted to) first part A and second part B. The fastener components 100, 100' may be employed to releasably secure the first and second parts A and B together. The first part A may take the form of a wall, door, shelf, fixture, cabinetry, furniture item, wall mounting, fixture, fitting, etc. The second part B may also take the form of a wall, door, shelf, fixture, cabinetry, furniture item, wall mounting, fixture, fitting, etc. In this regard, fastener component 100 can be securely mounted to part A and fastener component 100' can be securely mounted to part B. Such parts A and B may, for example, be found in prefabricated buildings. Such parts A and B may also be found in non-prefabricated buildings (e.g. that are built from the ground up). Like and unlike parts A and B may be releasably secured together using the example fastener components 100, 100'.

[0013] It should be appreciated that the example fastener components 100, 100' do not employ a loop arrangement. Rather, the components interact in a hook-to-hook coupling arrangement. It should also be appreciated that the example fastener components 100, 100' are not limited to use with buildings, and may be used to releasably secure together a range of different parts in fields related or unrelated to building. For example, parts to be releasably secured may be found in vehicles, factories, workshops, commercial offices, machinery rooms, domestic dwellings and structures, etc and in outdoor contexts, such as in constructions, structures, arrangements and configurations for sporting, entertainment and cultural events, for outdoor leisure activities, etc. Again, in such contexts, like and unlike parts A and B may be releasably secured together using the example fastener components 100, 100'.

[0014] Each of the example fastener components 100, 100' has a hook 102, 102' although, as schematically illustrated in Figures 2 and 3, each example fastener component may have two or four hooks, or may have three or more than four hooks (e.g. multiple or many hooks). When each example

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fastener component has multiple or many hooks, the hooks may extend along both the length and width of the component (e.g. in rows and columns of hooks, or in a circular or other pattern, or may even be randomly arranged along both the length and width of the component). The hooks may also be more or less densely packed than illustrated along both the length and width of the component.

- 5 [0015] Each hook 102, 102' has a distal end 104, 104'. The distal end 104, 104' is shaped and configured to define a generally planar surface 106, 106' that generally faces back towards a base 108, 108' of the fastener component 100, 100'. It should be appreciated that the planar surfaces 106, 106' are not required to be flat in that a general planarity still enables the surfaces 106, 106' to face each other and interact in a coupling arrangement.
- 10 [0016] Each base 108, 108' depicted in Figure 1 is square and has first and second axes of symmetry A_1 and A_2 that each extend between opposing mid-way points of respective opposing sides. Each base 108, 108' of each example fastener component 100, 100' is shown as planar, although could be curved, undulating, or of varying thickness throughout its length, etc to match, for example, a surface of the part A or B to which it is to be mounted. Further, whilst each base 108, 108' is depicted
- 15 as square, they may each have a rectangular, rhomboidal, trapezoidal, etc shape. Each base may take the form of an elongate strip or sheet.

- [0017] When planar, each base 108, 108' may be provided with a thickness such that, when each hook 102, 102' is formed out of its respective base 108, 108', the resulting hook thickness allows each of the hooks 102, 102' to resiliently (or elastically) deflect when brought into contact with each other,
- 20 thereby enabling the hooks 102, 102' to couple.

- [0018] In each fastener component 100, 100' a proximal part 110, 110' of the hook 102, 102' generally projects away from (i.e. out of the plane of the base) and in a diagonal direction with respect to the base 108, 108'. When each fastener component 100, 100' is viewed in plan orientation, the diagonally projecting direction of the proximal part 110, 110' of each hook is equally (equidistantly)
- 25 skewed with respect to each of the first and second axes A_1 and A_2 . It can also be seen that each hook 102, 102' is formed out of the plane of the base 108, 108', with a proximal end 112, 112' of the proximal part 110, 110' remaining connected to the base.

- [0019] When formed, each hook 102, 102' is also generally concave along its length, generally curving so as to face in towards the base 108, 108'. This curvature locates the planar surfaces 106, 106' of the distal ends 104, 104' in an optimal location for coupling. When formed, each hook 102, 102' is also provided with a twist 114, 114' extending intermediately, between the proximal part 110, 110' and distal end 104, 104', of the hook for part of its length. This twist serves to generally offset the planar surfaces 106, 106' to a square facing to the base, so that the distal ends 104, 104' are better able to
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hook with each other. The offset arrangement of the faces also helps to facilitate the deflection out and hooking back under of the hooks during coupling.

[0020] Each hook 102, 102' may be press-cut from or deformed out of the base, whereby each fastener component 100, 100' has an integral construction. This mode of formation defines a remaining slot 116, 116' in the respective bases 108, 108'. Alternatively, though likely to be less desirable for most purposes, each hook may be individually or collectively mounted to the base (e.g. by being screw-mounted, press-fit, swaged, welded, etc to the base).

[0021] Prior to coupling the fastener components 100, 100' to each other, the components are arranged such that the proximal part 110 projects in a first diagonal direction with respect to the base 108, and the proximal part 110' projects in a second diagonal direction with respect to the base 108' that is transverse to the first direction (i.e. if the arrangement of Figure 1 were viewed in plan elevation the slots 116, 116' would be seen to cross over each other). This transverse orientation helps to facilitate the hook-to-hook deflection to enable each hook to deflect out and then to hook back under the other, during coupling of the fastener components 100, 100'.

[0022] A series of the base 108 and 108' can respectively be arranged (e.g. in a spaced or abutting relationship) along the parts A and B that are to be releasably secured together.

[0023] To couple the fastener components 100, 100', the components are progressively brought together so that the planar surface 106 of fastener component 100 comes into a close facing arrangement with the planar surface 106' of fastener component 100'. In other words, the fastener components 100, 100' are coupled when the distal end 104 of hook 102 hooks under the distal end 104' of hook 102', and vice versa.

[0024] Because of the transverse orientation of the hooks 102, 102', when pushed into a coupled configuration, the distal ends 104, 104' are able to contact each other and can easily slide past each other, pushing each other sideways to allow a sliding passage. Once past each other, the resiliently biased nature of the hooks 102, 102' means they spring back to their original shape, to latch or "lock" behind one another. Hooks 102, 102' thus couple together in a hooked configuration wherein the planar surfaces 106, 106' face each other. In general usage of the fastener components 100, 100', the hooks are now not able to be urged out of their hooked configuration.

[0025] In this regard, if a force were applied normal to the fastener components 100, 100' (e.g. to pull apart parts A and B), being a direction opposite to the coupling direction of the hooks 102, 102', the orientation of the hooks now provides a substantial resistance to separation (or unlocking) of the hooks. A significantly greater force is required to separate the hooks than that employed to cause the original hooking. Where the fastener components 100, 100' comprise multiple coupled hooks, this

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separation force is increased proportionally further.

[0026] The coupling of the fastener components 100, 100' may be facilitated by guides to ensure optimal alignment of opposing hooks. For example, the guides may take the form of plates or flanges arranged at and optionally around the perimeter of each of the array of hooks in the fastener components 100, 100'. During coupling the opposing plates or flanges of the fastener components 100, 100' can become engaged and guide the components in a predetermined manner to ensure correct hook-to-hook alignment.

[0027] In a further alternative, some or all of the hooks may be configured to act as a guide to opposing respective hook(s) during coupling. For example, one or more of the hooks may comprise a projecting flange or lug that is arranged to interact with a projecting flange or lug on a corresponding opposing hook to guide the fastener components 100, 100' into a predetermined alignment. Such guiding arrangements may be employed for fastener components 100, 100' comprising a relative high density of hooks (large number of hooks over a small area), where it may be important to have alignment prior to coupling.

[0028] In a variation, such as for a lower density of hooks, the hooks may be manoeuvred into place. In this regard, when the fastener components 100, 100' are brought together, whereby each hook locates into a gap between adjacent hooks, the hooks may be manoeuvred into place by a relative lateral (or transverse) movement between the fastener components 100, 100'. In such a case, the eventual locking of the hooks can then hold the fastener components 100, 100' in a coupled configuration.

[0029] The respective engaged hooks 102, 102' are able to be separated from each other by inserting a planar element between the engaged hooks 102, 102'. Figures 4A to 4C show three embodiments of a planar element in the form of three example cleaving tools 400, 402 and 404 for use in separating coupled hooks of respective fastener components;

[0030] The example cleaving tool 400 can take the form of an elongate strip of metal such as a blade or spatula having a leading or major edge 406. The example cleaving tool 402 can take the form of an elongate strip of metal provided with a serrated major edge 406. The example cleaving tool 404 can take the form of an elongate strip of metal provided with downwardly hooked tines 408 along the major edge 406. The major edge 406 may alternatively be fluted. The shaping of the major edge 406 can assist engagement of this edge with each engaged hook pair 102, 102', and can help to facilitate hook separation (unhooking). The shaping of the major edge 406 can be employed to help separate hook distal ends that have a more pronounced hook or barb-like configuration. Such pronounced hook or barb-like configurations can provide a greater degree of hooking or coupling, but may be harder to

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separate, hence the use of a cleaving tool with a specially shaped major edge 406.

[0031] Each example cleaving tool 400, 402 and 404 may be passed between the engaged hooks 102, 102' in a left-to-right direction along the axis A_2 , being a direction that is normal to a pulling force of the engaged hooks 102, 102'. Alternatively, the example cleaving tool may be passed between the engaged hooks 102, 102' in a left-to-right direction along the axis A_1 . In each case the leading or major edge 406 is passed between the engaged hooks 102, 102'. The example cleaving tool functions to deflect each of the engaged hooks 102, 102' and thereby disengages the respective facing planar surfaces 106, 106'. This separation is noted to not cause any damage to the hooks 102, 102' and, therefore, the fastener components 100, 100' can be re-used after separation.

[0032] Figure 2 is a diagrammatic perspective representation of another example fastener component 200, and a like fastener component 200', which are arranged according to at least some embodiments described herein. In Figure 2 the example fastener components 200, 200' as shown are close to reaching the coupling position, whereupon they become coupled to each other.

[0033] Again, the example fastener components 200, 200' may be employed to releasably secure a first part A to a second part B, such as the parts outlined above in paragraphs [0012] and [0013].

[0034] In this embodiment the example fastener components 200, 200' each have two respective spaced hooks 202, 202' with each hook 202, 202' having an enlarged distal end 204, 204'. In this embodiment, each distal end 204, 204' is shaped to define a hooking projection 205, 205' that projects out from one side of the distal end 204, 204'. The hooking projections 205, 205' again define part of a planar surface 206, 206' at each distal end, but that has an increased surface area for respective inter-engagement of the facing planar surfaces 206, 206' when the fastener components 200, 200' are brought into the coupled position. The triangular shape of each projection 205, 205' also facilitates the hooking interaction between the hooks 202, 202'.

[0035] In each example fastener component 200, 200' a proximal part 210, 210' of each of the hooks 202, 202' again generally projects away and out of the plane of the base and in an angled direction with respect to the base 208, 208'. However, moving from left to right along each base 208, 208' the first hook 202 or 202' is angled to project in one direction, and the next hook is angled to project in another direction, as shown. In this regard, the inclination of each slot 216, 216' in the respective bases 208, 208' alternates whereby, when each base is viewed in plan orientation, the diagonally projecting direction of each hook is skewed with respect to each of the first and second axes of symmetry A_1 and A_2 , and in an alternating manner moving along the axis A_1 . For an elongate fastener component configuration that has multiple hooks, this alternating arrangement can be deployed along the length and breadth of the component.

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[0036] Prior to coupling the example fastener components 200, 200' to each other, the components are arranged such that the proximal part 210 projects in a first diagonal direction, and the proximal part 210' of its respective hook projects in a second diagonal direction that is transverse to the first direction (i.e. if the arrangement of Figure 2 were viewed in plan elevation the slots 216, 216' would cross over).

5 As previously explained, this transverse orientation facilitates hook-to-hook deflection to enable each hook to deflect out and then hook under the other, during coupling of the fastener components 200, 200'.

[0037] When the hook arrangement shown in Figure 2 is deployed in multiple rows across each fastener component, the orientation of adjacent hooks in adjacent rows may be the same or may
10 alternate. Otherwise, the configuration, functioning and labelling of the hooks 202, 202' in the example fastener components 200, 200' is generally the same as that described previously for the hooks 102, 102' and hence will not be redescribed.

[0038] Figure 3 is a diagrammatic perspective representation of yet another example fastener component 300, and a like fastener component 300', which are arranged according to at least some
15 embodiments described herein. In Figure 3 the example fastener components 300, 300' as shown are again close to reaching the coupling position, whereupon they become coupled to each other.

[0039] The example fastener components 300, 300' may be employed to releasably secure a first part A to a second part B, such as the parts outlined above in paragraphs [0012] and [0013].

[0040] In this embodiment the example fastener components 300, 300' each have four spaced
20 hooks 302, 302', each having an enlarged distal end 304, 304' with a hooking projection 305, 305' that projects out from one side of the distal end 304, 304', to define a planar surface 306, 306' of increased surface area.

[0041] Again, a proximal part 310, 310' of each of the respective hooks 302, 302' generally
25 projects away and out of the plane of the base and in an angled direction with respect to the base 208, 208', with the projecting direction of each hook being skewed with respect to the first and second axes of symmetry A₁ and A₂. However, moving from left to right along each base, each hook 302 or 302' is angled to project in the same direction as each other hook, whereby the inclination of each slot 316, 316' is the same. For an elongate fastener component configuration that has multiple hooks, this arrangement can be deployed along the length and breadth of the component.

30 [0042] Prior to coupling the fastener components 300, 300' to each other, the components are arranged such that the proximal part 310 projects in a first diagonal direction, and the proximal part 310' of its respective hook projects in a second diagonal direction that is transverse to the first direction (i.e. if the arrangement of Figure 3 were viewed in plan elevation the slots 316, 316' would cross over).

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[0043] When the hook arrangement shown in Figure 3 is deployed in multiple rows across each fastener component, the orientation of adjacent hooks in adjacent rows may be the same or may be opposite. Otherwise, the configuration, functioning and labelling of the hooks 302, 302' in the example fastener components 300, 300' is generally the same as that described previously for the hooks 102, 102' and hence will not be redescribed.

[0044] The configuration of each of the example fastener components 100, 100', 200, 200', and 300, 300', and the example cleaving tools 400, 402 and 404, enables each of them to be fabricated from sheet metal or metal plate, though materials may be employed that are suitable to the given application of the fastener components. The material selected may also relate to the size, purpose and required strength/durability of the example fastener components. For example, the fastener components or cleaving tools may be fabricated from other suitable materials, such as being moulded, woven etc from a plastic or composite material, etc.

[0045] When of metal, the metal may comprise a steel alloy, such as stainless steel and/or spring grade steel that has high yield strength, a high yield point and allows large elastic deformation, or be of aluminium, etc. Such metals may be referred to as having a 'springy' quality. When the metal is stainless steel it may comprise grades such as grade 304 or grade 316 which can prevent corrosion and ensure that each fastener component has a sufficient service life (e.g. exceeding the life of a prefabricated building when used in that application).

[0046] Other materials suitable for each of the example fastener components 100, 100', 200, 200', and 300, 300', and example cleaving tools 400, 402 and 404, may include engineered plastics such as those employed in the car industry. Such engineered plastics have a high strength and are relatively flexible. Example plastics include polybutylene terephthalate, polycarbonate and blends thereof, each optionally reinforced. For example, a blend of semi-crystalline polyester (e.g. polybutylene terephthalate or polyethylene terephthalate) and polycarbonate, or nylon blends. For applications not requiring a high separation load between the fastener components, commodity plastics such as polyethylene or polypropylene may be employed. The plastic may be injection moulded, and the concave surface of each hook may be 'cored' from a hole in the base of the fastener component, with the perimeter of the hole providing the projection of the hook (e.g. normal to the base).

[0047] When of metal, each hook may be die cut and pressed out of sheet metal so that its distal end extends approximately out of the plane of the sheet metal. Each hook may be formed discretely, each on a separate base (as illustrated in Figure 1), or may be formed as a plurality of hooks pressed from a single base plate in a single stage die-press operation.

[0048] When each hook is to be die cut and pressed out of sheet metal, each hook may be about 5

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mm in length, but is not limited to this size. In such case, the hook may extend approximately 5 mm out of the plane of the sheet metal. For example, the hooks 102, 102' shown in Figure 1 may each represent a hook that is formed out of a metal sheet having the dimensions 10 mm by 10 mm and 0.2 mm thick.

[0049] When of metal, each example cleaving tool 400, 402 and 404 may be die cut or machined out of sheet metal. When of plastic, each example cleaving tool 400, 402 and 404 may be injection moulded.

[0050] The geometry of the hooks may be determined such that the movements they experience when joining/mating and separating/cleaving allows the material from which they are made to experience elastic deformation (i.e. the geometry may be such that the hook may spring back to its original shape). Understanding the relationship between the thickness of the metal, the metal type or grade, and the size of the hook can facilitate such elastic deformation of the hook. For example, if thicker plate material is used the size of each hook may be increased accordingly.

[0051] The amount of load in tension and shear that the hooks can carry may also be engineered by modifying the geometry of the hook, the twist in the hook and the thickness of the material. The opposing hooks that interact may comprise non-identical profiles, structural properties and characteristics to alter the manner by which they couple.

[0052] In use, one or more of the of the example fastener components 100, 200 and/or 300 is mounted to a first part A, and one or more of the example fastener components 100', 200' and/or 300' is mounted to a first part B (Figure 1A). For example, each of the fastener components can be mounted at or along a face or surface (such as at an edge) of each of the first and second parts A and B. Such surfaces may be non-planar and non-contiguous (e.g. the "surface" may be defined by two faces intersecting at a corner). Thus, the fastener components can be employed to releasably secure together respective opposing or adjacent faces or surfaces of the first and second parts A and B.

[0053] The orientation of the components after mounting is such that a direction of projection of a given hook 102, 202 or 302 on the fastener component 100, 200 or 300 is opposite to a direction of projection of its corresponding hook 102', 202' or 302' on the other fastener component 100', 200' or 300'. As explained above, this assists with the deflection and coupling of the opposing hooks. This orientation may generally occur at the time of mounting each fastener component to its respective part A or B.

[0054] The appropriately facing fastener components are then brought (e.g. urged) together so that the hook distal ends hook(s) 104, 204 or 304 engage with the corresponding hook distal ends 104', 204' or 304' to cause each hook to be deflected out, so that the distal ends move past each other. Once past, the distal ends may then deflect back in, so that the planar part 106, 206 or 306 of each hook

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comes into a close-facing position with the planar part 106', 206' or 306' of its corresponding hook. In this orientation, the hooks become hooked together and the fastener components become coupled, whereby the first and second parts A and B become releasably secured together.

[0055] Each fastener component can be mounted and secured to its respective part A or B by a chemical adhesive or by one or more mechanical fasteners (e.g. screws such as self-fastening screws; bolts; projecting burrs or tangs (such as employed on nail plates); etc). For example, when each fastener component is elongate, it can be progressively and sequentially mounted along its length to its respective part A or B, such as by being pressed by a tool, forced by a hammer or mallet, etc.

[0056] When each fastener component is elongate, it may be supplied in a rolled or strip form, whereby it can be progressively rolled out and sequentially mounted along its length to its respective part A or B. When attached by chemical adhesive, the adhesive can be pre-applied to an underside of a base of each fastener component, covered by a removable membrane or film. When attached by mechanical fasteners, a suitable number of these can be supplied together with each fastener component, and together with separate or "integrated" directions for use (e.g. printed or marked onto each component and optionally onto parts A and B).

[0057] Each of the respective parts A or B can be pre-fabricated with the example fastener components 100, 100', 200, 200', or 300, 300' already secured thereto, or the fastener components can be attached on site to the respective parts A or B.

[0058] While the above description is concerned with fastener components for use in buildings (prefabricated and built on site) it will be understood that the fastener components are not limited to such applications. For example, they may be used to secure together two parts or components in cabinetry, furniture, vehicles, factories, workshops, commercial offices, machinery rooms, dwellings and structures, other constructions, structures, and outdoor arrangements, etc.

[0059] With respect to the use of substantially any plural and/or singular terms herein, those having skill in the art can translate from the plural to the singular and/or from the singular to the plural as is appropriate to the context and/or application. The various singular/plural permutations may be expressly set forth herein for sake of clarity.

[0060] It will be understood by those within the art that, in general, terms used herein, and especially in the appended claims (e.g., bodies of the appended claims) are generally intended as "open" terms (e.g., the term "including" should be interpreted as "including but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes but is not limited to," etc.). Further, except where the context requires otherwise due to express language or necessary implication, the word "comprise" or variations such as "comprises" or

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"comprising" is used in an inclusive sense, i.e. to specify the presence of the stated features but not to preclude the presence or addition of further features in various embodiments of the invention. It will be further understood by those within the art that if a specific number of an introduced claim recitation is intended, such an intent will be explicitly recited in the claim, and in the absence of such recitation no such intent is present. For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim recitation to embodiments containing only one such recitation, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an" (e.g., "a" and/or "an" should be interpreted to mean "at least one" or "one or more"); the same holds true for the use of definite articles used to introduce claim recitations. In addition, even if a specific number of an introduced claim recitation is explicitly recited, those skilled in the art will recognize that such recitation should be interpreted to mean at least the recited number (e.g., the bare recitation of "two recitations," without other modifiers, means at least two recitations, or two or more recitations). Furthermore, in those instances where a convention analogous to "at least one of A, B, and C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (e.g., "a fastener having at least one of A, B, and C" would include but not be limited to fasteners that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). In those instances where a convention analogous to "at least one of A, B, or C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (e.g., "a fastener having at least one of A, B, or C" would include but not be limited to fasteners that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). It will be further understood by those within the art that virtually any disjunctive word and/or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or both terms. For example, the phrase "A or B" will be understood to include the possibilities of "A" or "B" or "A and B."

[0061] As will be understood by one skilled in the art, for any and all purposes, such as in terms of providing a written description, all ranges disclosed herein also encompass any and all possible sub-ranges and combinations of sub-ranges thereof. Any listed range can be easily recognized as sufficiently describing and enabling the same range being broken down into at least equal halves, thirds, quarters, fifths, tenths, etc. As a non-limiting example, each range discussed herein can be

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CLAIMS

1. A fastener component that is able to be mounted with respect to a first member to enable the first member to be coupled to a like fastener component that is itself able to be mounted with respect to a second member, the fastener component comprising:
 - at least one projecting hook, with a distal part of the at least one hook comprising a generally planar part that faces back generally towards a remainder of the fastener component;
wherein the planar part of the at least one hook of the fastener component is able to be positioned to face a planar part of a hook of the like fastener component whereby coupling of the fastener components can occur.
2. The fastener component of claim 1, wherein each of the fastener component and the like fastener component further comprises a base, wherein the at least one hook projects with respect to the base, with a proximal part of the at least one hook generally projecting in a first direction away from the base.
3. The fastener component of claim 2, wherein the at least one hook comprises a twist defined intermediate the proximal and distal parts of the hook, whereby the planar part is generally offset to a square facing of the base.
4. The fastener component of claim 2 or 3, wherein the base of each of the fastener component and the like fastener component is planar, and the proximal part of the at least one hook projects in the first direction away from the plane of the base.
5. The fastener component of claim 4, wherein the at least one hook is formed out of the plane of the base, with a proximal end of the proximal part of the hook remaining connected to the base.
6. The fastener component of claim 4 or 5, wherein the at least one hook is press-cut from or deformed out of the base.
7. The fastener component of any one of the preceding claims, wherein the at least one hook is, along its length, generally concave so as to face in towards a remainder of the fastener component or a remainder of the like fastener component.

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8. The fastener component of any one of the preceding claims, wherein the distal part of the at least one hook is laterally enlarged relative to a remainder of the hook.
- 5 9. The fastener component of claim 8, wherein the lateral enlargement comprises a projection along one side of the distal part of the at least one hook.
- 10 10. The fastener component of any one of the preceding claims wherein each of the fastener component and the like fastener component comprises a base that is square or rectangular, having first and second axes of symmetry that each extend between opposing mid-way points of respective opposing sides; and
wherein, when the base is viewed in a plan orientation, the at least one hook projects from the base in a first direction that is skewed with respect to each of the first and second axes.
- 15 11. The fastener component of any one of the preceding claims wherein each of the fastener component and the like fastener component comprises a plurality of projecting hooks.
- 20 12. The fastener component of claim 11, wherein, when each of the fastener component and the like fastener component comprises a rectangular base that defines first and second axes of symmetry extending between opposing mid-way points of respective opposing sides, the plurality of hooks are spaced along the rectangular base of each of the fastener component and the like fastener component.
- 25 13. The fastener component of claim 12, wherein, for each of the fastener component and the like fastener component, the first direction of a given hook is skewed in one way with respect to each of the first and second axes; and the first direction of a next adjacent hook is skewed in an alternate way with respect to each of the first and second axes; with this alternating skew pattern repeating along the base.
- 30 14. The fastener component of any one of the preceding claims, wherein the at least one hook of each of the fastener component and the like fastener component is formed from a deflectable material, whereby respective hooks of the fastener component and like fastener component are able to be moved against each other to deflect and engage, whereby the planar part of the at

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least one hook of the fastener component faces the planar part of a corresponding hook of the like fastener component.

5 15. The fastener component of claim 14, wherein the respective engaged hooks of the fastener component and like fastener component are able to be separated from each other by inserting a planar element between the hooks, so as to deflect each of the hooks and thereby disengage the respective facing planar parts.

10 16. The fastener component of any one of the preceding claims that is formed from metal sheet or plate.

17. A method for coupling a first member to a second member, the method comprising:

15 - mounting a fastener component to the first member and mounting a like fastener component to the second member, each fastener component being as defined in any one of claims 1 to 16;

- orienting the fastener components on each of the first and second members whereby a first direction of projection of a given at least one hook on the fastener component is opposite to a first direction of projection of a corresponding hook on the like fastener component;

20 - facing and bringing together the fastener components on the first and second members whereby the planar part of the at least one hook of the fastener component is positioned to face the planar part of the corresponding hook of the like fastener component, whereby coupling of the fastener components and thus the first and second members occurs.

25 18. The method of claim 17, wherein each fastener component is mounted to its respective member by a chemical adhesive or one or more mechanical fasteners.

19. The method of claim 17 or 18, wherein, when each fastener component is elongate, it is progressively and sequentially mounted along its length to its respective member.

30 20. The method of any one of claims 17 to 19, wherein the orientation of the fastener components on each of the first and second members occurs at the time of mounting each fastener component to its respective member.

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21. The method of any one of claims 17 to 20, wherein each of the fastener components is mounted at or along a face on each of the first and second members, whereby the first and second members are coupled together by the fastener components at respective opposing faces of the first and second members.

22. A first member having mounted thereto the fastener component of any one of claims 1 to 16, and a second member having mounted thereto the like fastener component of any one of claims 1 to 16.

23. A system for coupling a first member to a second member, the system comprising:

- a fastener component for the first member and a like fastener component for the second member, each fastener component being as defined in any one of claims 1 to 16;
- a chemical adhesive or one or more mechanical fasteners for mounting each fastener component to its respective member.

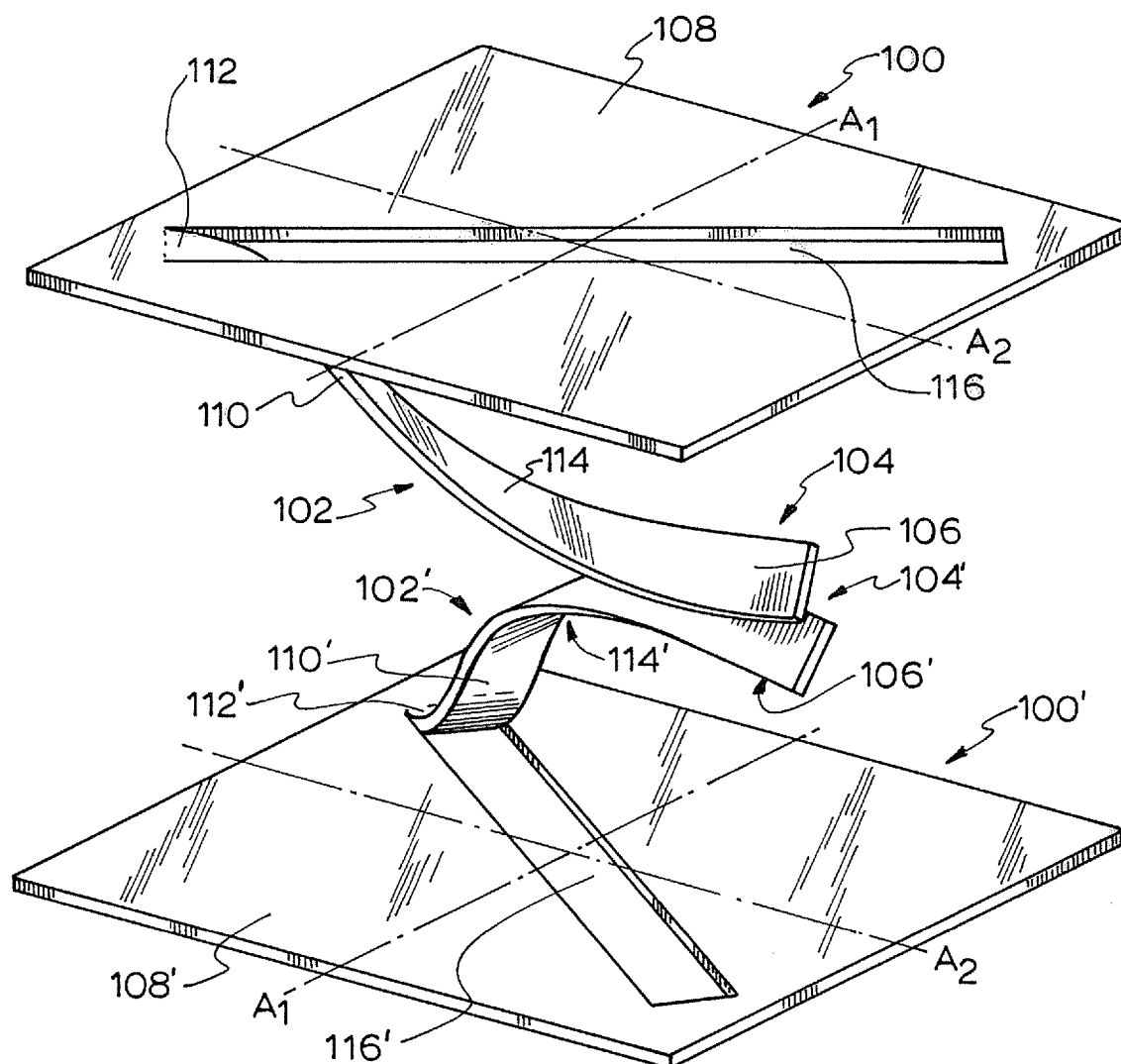
24. The system of claim 23, wherein each fastener component is elongate and is supplied in a rolled or strip form.

25. The system of claim 23 or 24, wherein:

- the chemical adhesive is pre-applied to an underside of a base of each fastener component;
- the one or more mechanical fasteners are supplied with each fastener component.

26. The system of claim 25, wherein the chemical adhesive is covered by a removable membrane or film.

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Fig. 1.

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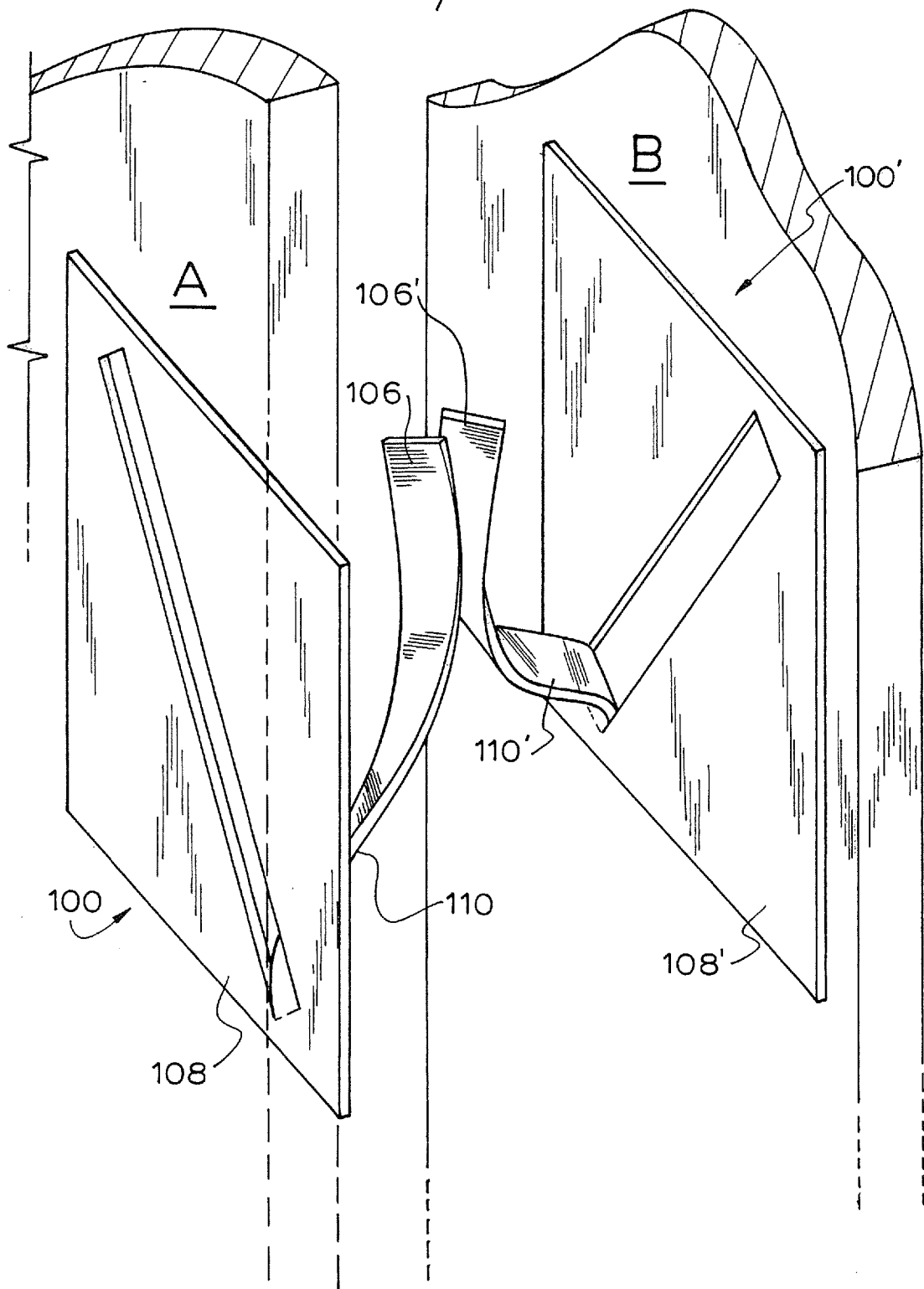


Fig. 1A.

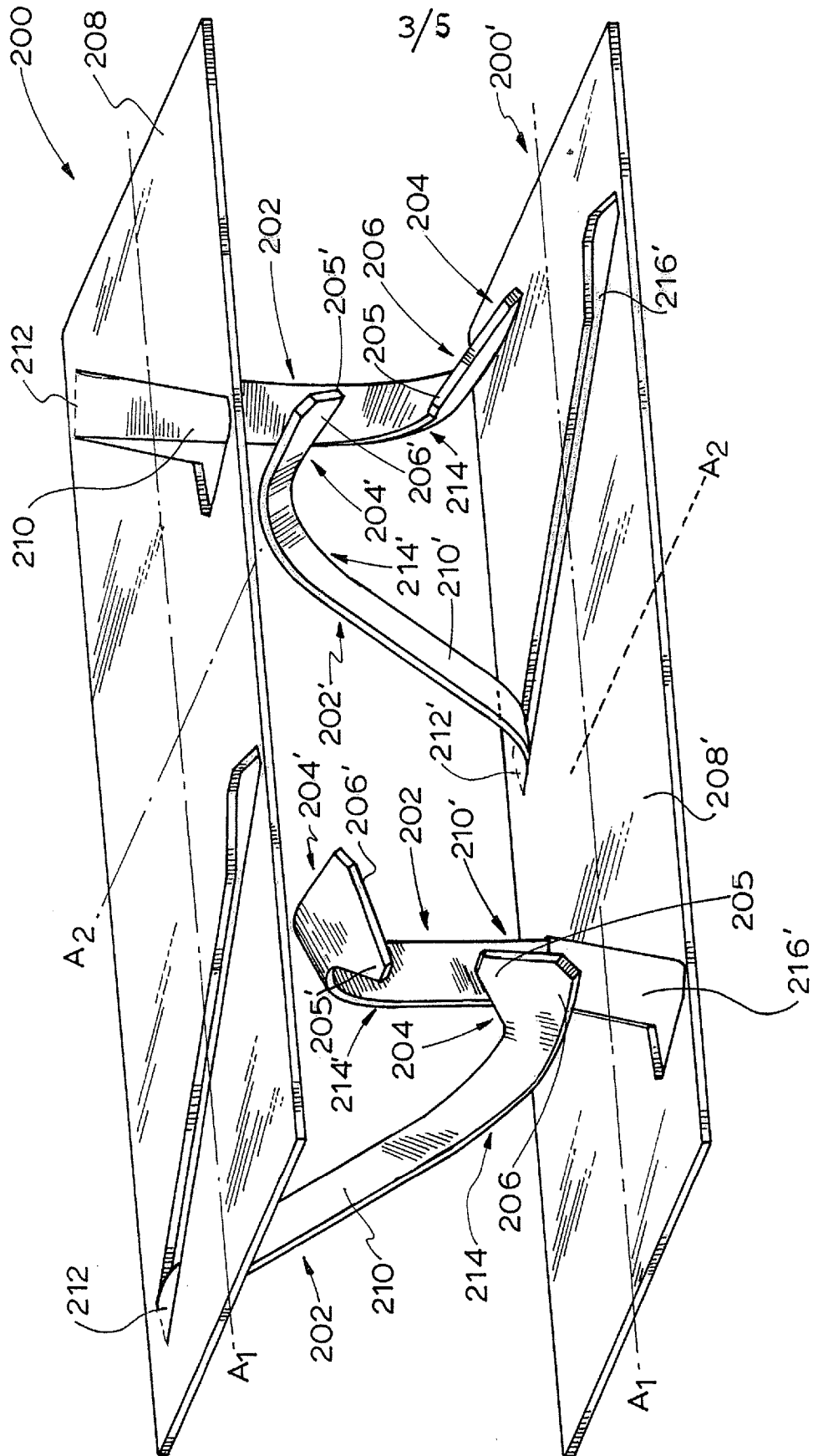


Fig-2

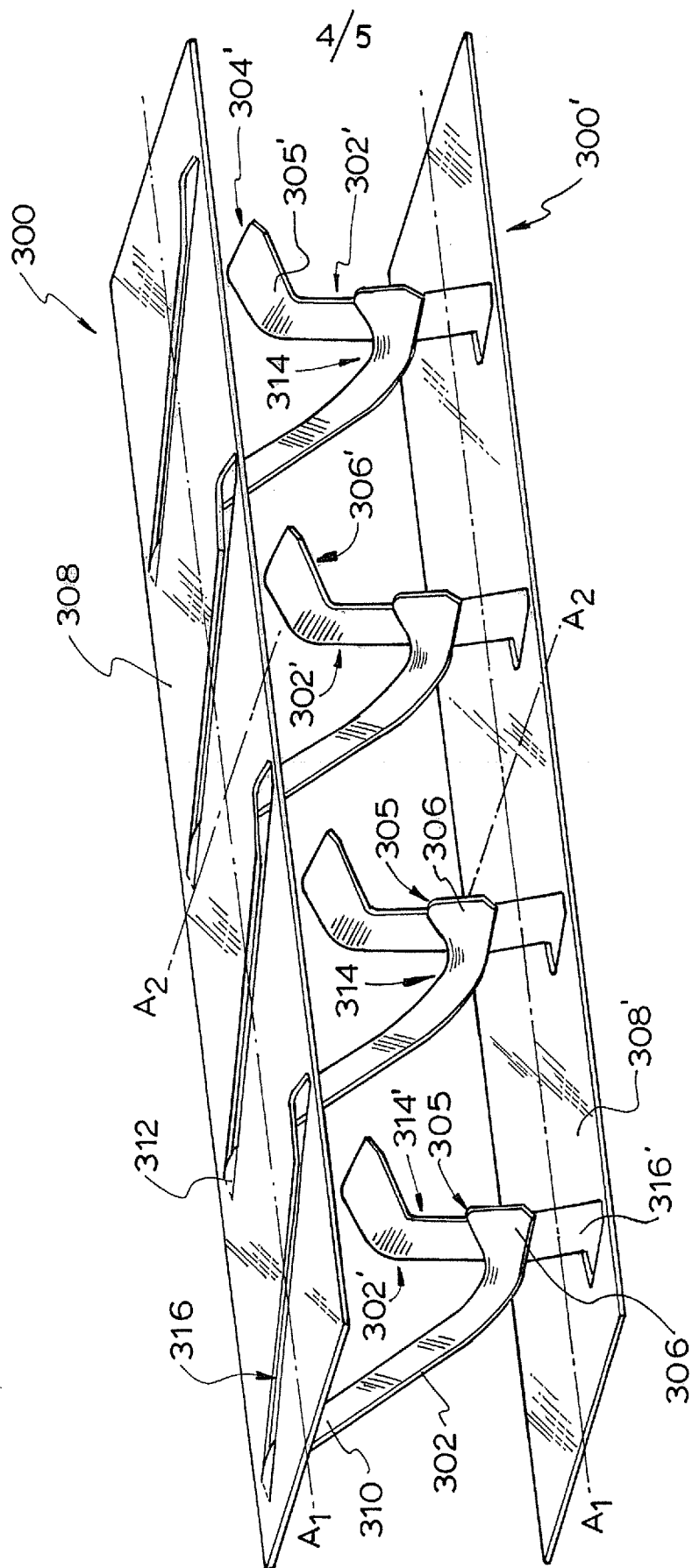


Fig. 3.

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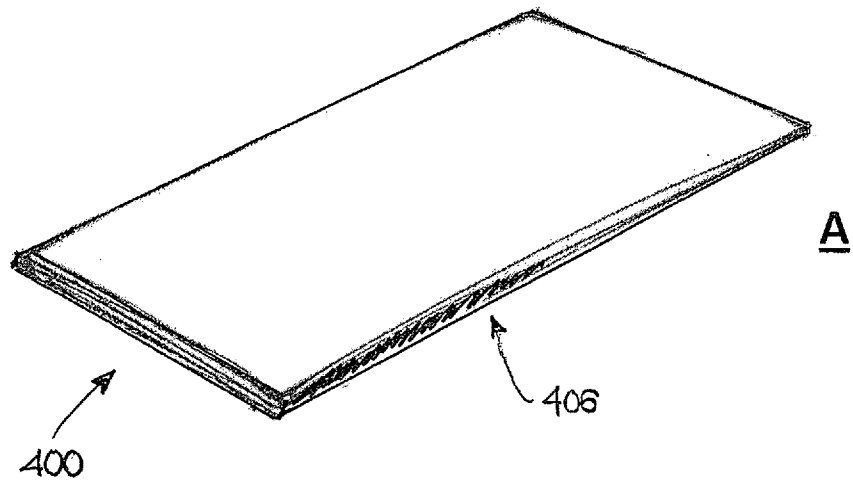
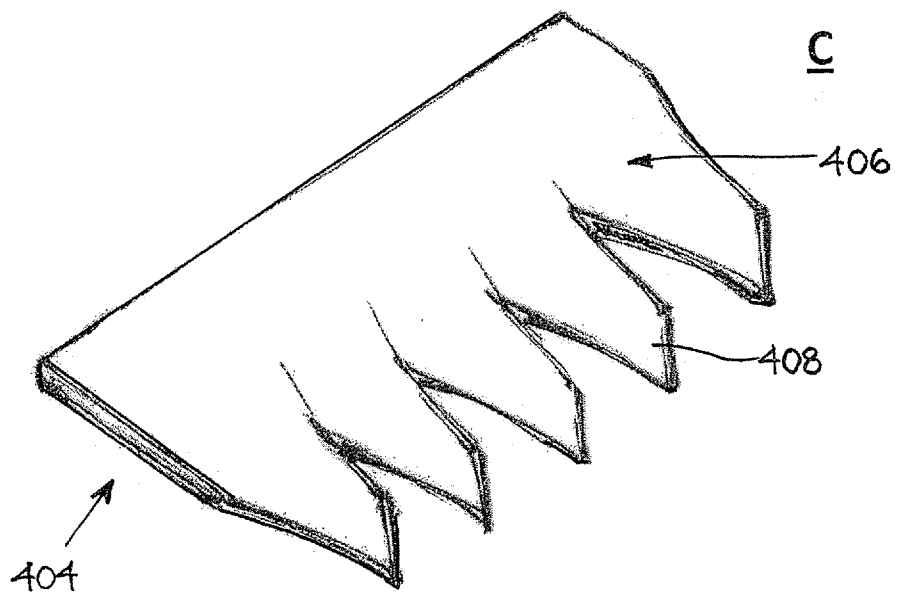
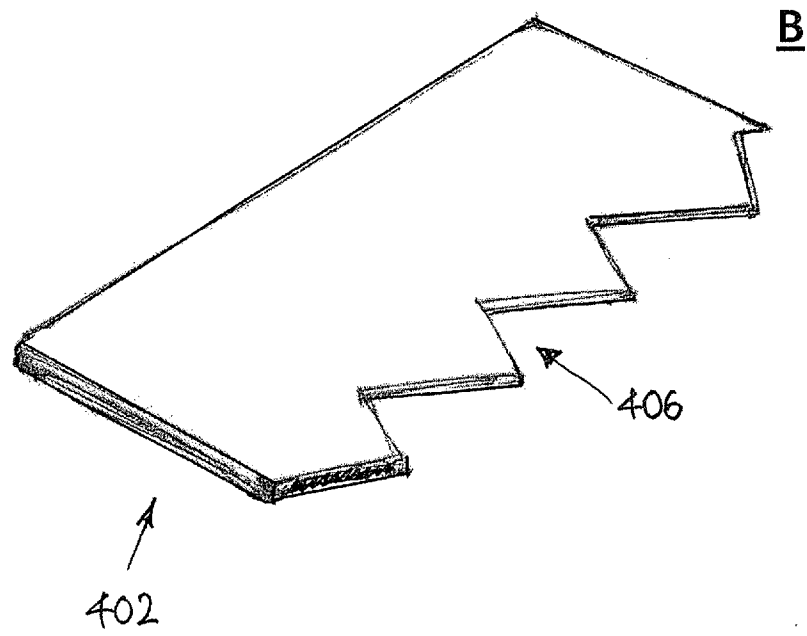


FIG. 4



INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2011/000723

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

A44B 18/00 (2006.01)**E04B 1/38** (2006.01)**F16B 5/00** (2006.01)**A47B 97/00** (2006.01)**F16B 2/00** (2006.01)**F16M 13/00** (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)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPDOC and WPI: IPC & ECLA: A44B18/-, E04B1/-, A47B97/-, F16B2/-, F16B5/-, F16M13/- & keywords: hook, fastener, engage, twist, concave and similar terms.

Google Patent: keywords: hook, releasable, fastener, Velcro, chemical adhesive.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5119531 A (BERGER et al.) 9 June 1992 Figures 1, 4d, 7-9, 11-14	1-17, 19-22
X	US 5902427 A (ZINKE et al.) 11 May 1999 Figures 1, 7, 12	1-2, 4-9, 11-12, 14-15, 17-26
X	EP 0421295 B1 (YOSHIDA KOGYO K.K. [JP]) 2 February 1994 Figures 1-5	1-2, 4-9, 11-12, 14-15, 17, 19-22
X	EP 0574863 B1 (YKK CORPORATION [JP]) 22 December 1993 Figures 1-2	1-2, 4-7, 11-12, 14-15, 17, 19-22



Further documents are listed in the continuation of Box C



See patent family annex

* Special categories of cited documents:	
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"E" earlier application or patent but published on or after the international filing date	"X" 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
"L" 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)	"Y" 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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
9 August 2011Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2011/000723

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
US	5119531	EP	0364521	ES	2016435	FR	2627818
		FR	2636683	WO	8908201		
US	5902427	AU	12911/95	AU	21185/95	CA	2166325
		CA	2185115	EP	0711119	EP	0749483
		NZ	294532	US	5403747	US	5478748
		US	5646253	US	5691026	US	5691027
		US	5952484	US	6124106	US	6348195
		WO	9503723	WO	9524482		
EP	0421295	CA	2026736	JP	H0355716U	US	5067210
EP	0574863	CA	2097406	CN	1080145	HK	1001486
		JP	H06121U	SG	64921	US	5457856
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.							
END OF ANNEX							