<table>
<thead>
<tr>
<th>(12) PATENT</th>
<th>(11) Application No. AU 199860663 C</th>
</tr>
</thead>
<tbody>
<tr>
<td>(19) AUSTRALIAN PATENT OFFICE</td>
<td>(10) Patent No. 697786</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(54) Title</th>
<th>A fastening system</th>
</tr>
</thead>
<tbody>
<tr>
<td>(51) International Patent Classification(s)</td>
<td></td>
</tr>
<tr>
<td>F16S 3/08 (2006.01)</td>
<td>E04B 2/72 (2006.01)</td>
</tr>
<tr>
<td>F16B 5/07 (2006.01)</td>
<td>F16S 1/02 (2006.01)</td>
</tr>
<tr>
<td>(21) Application No:</td>
<td>199860663</td>
</tr>
<tr>
<td>(22) Application Date:</td>
<td>1998.04.07</td>
</tr>
<tr>
<td>(30) Priority Data</td>
<td></td>
</tr>
<tr>
<td>(31) Number</td>
<td>199860663</td>
</tr>
<tr>
<td>(32) Date</td>
<td>1997.09.12</td>
</tr>
<tr>
<td>(33) Country</td>
<td>AU</td>
</tr>
<tr>
<td>(43) Publication Date :</td>
<td>1998.10.15</td>
</tr>
<tr>
<td>(43) Publication Journal Date :</td>
<td>1998.10.15</td>
</tr>
<tr>
<td>(44) Accepted Journal Date :</td>
<td>1998.10.15</td>
</tr>
<tr>
<td>(44) Amended Journal Date :</td>
<td>2006.04.13</td>
</tr>
<tr>
<td>(62) Divisional of:</td>
<td></td>
</tr>
<tr>
<td>199746098</td>
<td></td>
</tr>
<tr>
<td>(71) Applicant(s)</td>
<td></td>
</tr>
<tr>
<td>John Scholtes Investments (No.1) Pty. Ltd.</td>
<td></td>
</tr>
<tr>
<td>(72) Inventor(s)</td>
<td></td>
</tr>
<tr>
<td>Kevin Forno</td>
<td></td>
</tr>
<tr>
<td>(74) Agent/Attorney</td>
<td></td>
</tr>
<tr>
<td>Cullen and Co,GPO Box 1074,BRISBANE QLD 4001</td>
<td></td>
</tr>
</tbody>
</table>
ABSTRACT

A method for attaching an edge channel to a panel member, the method comprising providing a plurality of spaced apart projections adjacent an edge of the panel member which lock against at least one projection in the edge channel when the edge of the panel member and the edge channel are pushed together, the plurality of spaced apart projections being punched out lugs on the panel member, the lugs extending from each side of the panel member, the edge channel having two upstanding sidewalls between which the panel member can pass, each sidewall having a top turned in lip which forms the at least one projection in the edge channel.
AUSTRALIA
Patents Act 1990

COMPLETE SPECIFICATION
FOR A STANDARD PATENT

Name of Applicant: JOHN SCHOLTES INVESTMENTS (NO.1) PTY. LTD.
(A.C.N. 009 792 670)

Actual Inventor: Kevin FORNO

Address for Service: CULLEN & CO.,
Patent & Trade Mark Attorneys,
240 Queen Street,
Brisbane, Qld. 4000,
Australia.

Invention Title: A FASTENING SYSTEM

Details of Associated Provisional Application:
No. PO9223 filed 12 September 1997

The following statement is a full description of this invention, including the best method of performing it known to us:
This invention relates to a fastening system and particularly relates to a fastening system to fasten an edge channel to a panel member.

The invention will be described with reference to metal panels but it should be appreciated that no limitation is meant thereby.

Metal panels such as metal corrugated panels are thin walled in construction and are widely used in steel building products such as garden sheds, carports and garages together with novelty products such as garden tidies, children’s cubby houses and kennels.

These metal panels have a thin free edge which is rather sharp and it is desirable to blunt or cover the panel edges.

The panels are of thin wall construction and this requires a surround frame to be attached around the panel to provide structural rigidity. The surround frame is typically in the form of metal edge channels which accommodate an edge of the panel to provide structural rigidity and also to cover the sharp edge.

The edge channel must be fastened to the panel edges in order to provide the structural rigidity.

To date, it has been necessary to fasten the channel using screws or rivets or less commonly by spot-welding. Each of these fastening systems suffers from disadvantages.

The main disadvantage with current fastening systems is that they are laborious. For instance, for an average garden shed it is necessary to use over 250 screws or rivets to hold the shed together. Most of the screws and rivets are used to fasten the edge channel to the metal panel.

Similarly, spot-welding is laborious and difficult and is not suited to the home handyman.

Attaching the edge channels using screws and rivets requires drilling hundreds of holes in the respective panels and edge channel. The holes must be carefully aligned such that a self-tapping screw or rivet can be used to attach the two components together. Again, such a system is not suited to the home handyman.
The edge channel is usually fairly small and the upstanding side walls of the edge channel are usually fairly narrow. Therefore, it is often difficult to correctly drill holes and insert the screw or rivet into the hole.

Because of the above disadvantages, the sheds or like structures are often poorly assembled. This creates an injury hazard should the shed collapse.

More importantly, outdoor structures are required to be rated against environment extremes including wind loading, and snow loading. A poorly assembled outdoor structure can not be considered to comply with the wind loading and snow loading minimum requirements.

Other disadvantages with currently assembly systems is that a great many tools are required, including drills, rivet guns, screwdrivers, and the like, and the complicated assembly means that the person assembling the structure often uses less fasteners than are required to provide the proper amount of strength to the structure.

It is object of the invention to provide a method by which a panel can be attached to an edge channel without the use of screws, rivets, welds, adhesives or other types of separate fasteners.

It is an object of the invention to provide a method which may overcome the abovementioned disadvantages or provide the public with a useful of commercial choice.

In one form, the invention resides in a method for attaching an edge channel to a panel member, the method comprising providing a plurality of spaced apart projections adjacent an edge of the panel member which lock against at least one projection in the edge channel when the edge of the panel member and the edge channel are pushed together.

In one form, the panel member can be snap-locked or press-fitted into the edge channel to provide a secure fit without the use of screws or rivets.

A major advantage of the method is that not only is installation greatly simplified, but the structure can be assembled with less
risk or no risk of the structure not complying with various standards or regulations with regard wind load, strength, snow load, and the like.

The method can be used to construct a variety of structures. These structures can include garden sheds, carports, garages, garden tidies, children's cubby houses, animal kennels, and it should be appreciated that no limitation is placed on the type of structure.

The panel member can comprise a wall panel, roof panel, door panel, floor panel, ceiling panel, combination of the above panels, fence panels, and no limitation is to be placed on the panel member.

The panel member can be a continuous panel member such as a steel sheet. The steel sheet is usually profiled or corrugated to provide strength and rigidity. The steel sheet can be treated to prevent corrosion and can be painted, profiled, and the like.

The panel can be comprise a non-continuous panel and this could include wire grid panels, panels with openings in them, perforated panels.

The panel can comprise one or more sheets and can include double thickness panels, triple thickness panels, strengthened panels, and the like.

Panels can have varying sizes and shapes and varying thickness and profiles depending on the use of the panel.

The edge channel is typically formed from metal. A typical channel shape is one which is substantially U-shaped having a pair of spaced apart side walls and a connecting member (this can be a bottom wall or top wall or edge wall depending on how the channel is used). In a preferred embodiment the channel is roll-formed from a strip of sheet material as is known. The channel length, cross-section size and thickness can vary to suit and the channel can also be coated or otherwise treated to prevent corrosion or provide a decorative appearance. The channel can be provided with drainage slots or apertures, if desired.

On an edge of the panel member where it is desired to attach an edge channel, there is provided a plurality of spaced apart projections.
In one form, these projections comprise lugs which can be punched out from the panel member. Other types of projections are also envisaged but punched out lugs at this stage are considered to be the most convenient and cost-effective way to form the projections.

The projections are spaced apart and the distance between projections, the size of the projections, the shape of the projections, can be varied to suit the type of attachment required. That is, if the attachment is meant to be very secure, more projections than usual can be used. Alternatively, the size of the projections can be increased to provide a better locking action.

It is preferred that projections extend from each side of the panel member such that the panel member can lock to each side of the edge channel which can provide a more secure locking action.

The edge channel has at least one projection against which the projections on the panel member can lock. The at least one projection can comprise a return lip on the periphery of at least one and preferably both of the side walls of the edge channel. The return lip can be readily roll-formed or otherwise formed into the edge channel.

It is possible for the edge channel to contain a separate projection which can be attached by spot-welding, adhesives, or fasteners. This separate projection can be installed at the factory, if desired.

To provide a secure locking action, the edge channel may have a projection on each side wall of the edge channel such that the panel member can be locked against both side walls of the edge channel.

To improve the locking strength between the edge channel and the panel member, it is preferred that the plurality of spaced apart projections on the panel member are spaced somewhat from the edge of the panel member. That is, the more metal there is between the projection and the edge of the panel member, the less will be the chance of the projections becoming torn away. The projection in the edge channel will need to be correspondingly positioned to allow it to engage with the projections on the panel member. For this reason, it is preferred that the projections on the
edge channel are adjacent the upper most portion of the edge channel which in turn allows the projections on the panel member to be somewhat spaced from the edge of the panel member.

In order to allow the edge channel and the panel member to push-lock together, it is preferred that the edge channel has a degree of resiliency to allow it to expand somewhat to accommodate the projections. Alternatively, the projections can have a degree of resiliency and it is envisaged that in a further alternative both the edge channel and the panel member can be resilient to some extent.

An embodiment of the invention will be described with reference to the following drawings in which

Figure 1 is shows a lower portion of the edge panel above an edge channel;

Figure 2 shows a panel member press-locked into an edge channel;

Figure 3 is a front view of a typical panel member showing a plurality of spaced apart projections at a lower edge of the panel member;

Figure 4 is a close-up view of two spaced apart projections on the panel member.

Referring to the drawings, there is shown a panel member 10. In the embodiment, panel member 10 is formed from thin sheet steel coated with a corrosion-resistant coating. This type of steel product is commercially available. The panel member is roll-formed to provide a profile or corrugation as illustrated in Figure 1. This gives the panel member 10 a thickness between the front most portion of the panel member 11 and rearmost portion of the panel member 12 and this is illustrated in Figure 2.

Adjacent an edge of panel member 10 are a plurality of spaced apart projections which in the embodiment comprise punched lugs 13, 14 as illustrated in Figures 1 and 2. Figure 3 shows a series of punched lugs 13, 14, and these can be punched out using an appropriately profiled roller.
One of lugs 13 is punched out a rearmost portion 12 of panel member 10 while the other of the lugs 14 is punched out of the foremost portion 11 of panel member 10. This alternating arrangement means that the lugs extend outwardly from both sides of panel member 10.

Edge channel 15 is formed from rolled sheet steel which can be formed continuously and cut to size. Edge channel 15 has a front side wall 16, a rear side wall 17 and a bottom wall 18, better illustrated in Figure 2.

Front side wall 16 is shorter than rear side wall 17, the reason for this being to allow any water accumulating in edge channel 15 to flow over front side wall 16 and away from the inside of the shed or structure being assembled.

Edge channel 15 has a pair of projections in the edge channel which in the embodiments are turned in top lips 19 and 20.

In the embodiment, edge channel 15 is 17mm wide, the front side wall is 15mm high and the rear side wall is 20mm high. The edge channel is formed from 0.4mm thick Zincalume/Colorbond steel, the product being commercially available. Of course, no limitation is meant to the invention by virtue of the embodiment.

An advantage of having the projection in the edge channel being formed from a continuous lip 19, 20 is that no alignment is required between lugs 13 and 14 and lips 19 and 20. If lips 19 and 20 were discontinuous, it may be necessary to align the edge channel with the panel member to ensure that the projections lock together.

To provide a good locking action, lugs 13, 14 are as far away from the bottom edge 21 of panel member 10 as possible. Thus, in Figure 2 rear lug 13 is formed higher up panel member 10 than front lug 14 to take advantage of the taller rear side wall 17.

The length of return lips 19, 20 which may vary the strength of the locking action between the panel member and the edge channel. In the embodiment, the distance between the edge of the lip 19, 20 and its respective side wall is about 2mm.
Referring to Figure 4, lugs 13 and 14 are shown in greater detail. In the embodiment, the lugs have a top wall 22 of 10mm in length and a bottom wall 23 of 10mm in length. The side walls 24 in the embodiments are 3.5mm. Each lug projects outwardly a distance of about 2mm.

The panel member is able to be framed by an edge channel by a simple push locking action. Once the members are push-locked together, it is virtually impossible to pull apart the members without destroying one or both of the members. For a rectangular panel member, two edge channels can be push-locked onto the top and bottom edges of the panel member.

The framed, or partially-framed panel members, can then be readily assembled into a shed or other like structure. It may be necessary to fasten adjacent framed panel members together and this may necessitate separate fasteners, but it is considered that assembly time can be reduced by up to 60% by not needing to use separate fasteners on the edge channels as well. It is envisaged that approximately 150 less holes are required and 150 less screws are required to assemble a typical 3 metre square garden shed.

It may be possible to separate the panel member from the edge channel by sliding the panel member out of the edge channel or vice versa but it is virtually impossible to pull apart the two members without destroying either or both.

It should be appreciated that various other changes and modifications can be made to the embodiment described without departing from the scope of the invention.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method for attaching an edge channel to a panel member, the method comprising providing a plurality of spaced apart projections adjacent an edge of the panel member which lock against at least one projection in the edge channel when the edge of the panel member and the edge channel are pushed together, the plurality of spaced apart projections being punched out lugs on the panel member, the lugs extending from each side of the panel member, the edge channel having two upstanding sidewalls, one of which is taller than the other and between which the panel member can pass, each sidewall having a top turned in lip which forms the at least one projection in the edge channel.

2. A panel assembly made according to the method of claim 1.

3. A method for attaching an edge channel to an edge of a panel member, the panel member having a plurality of spaced apart projections adjacent the edge of the panel member and extending from each side of the panel member, the edge channel having a recess in which the edge of the panel member can pass, the recess having a pair of sidewalls, one of which is taller than the other, and the edge channel having at least one projection which locks with at least one of the projections on the panel member, to hold the edge channel to the panel member.

4. The method of claim 3, wherein the projections extend from each side of the panel member in an alternating manner.

5. The method of any one claims 3-4, wherein the projections on the panel member are punched out lugs.

6. The method of claims 3-5, wherein the projection on the edge channel is a turned in lip.

7. The method of claim 6, wherein each sidewall has a turned in free lip which defines the projection.

8. A panel assembly made according to any one of claims 3-7.

9. A panel assembly comprising a panel member and an edge channel, the panel member having an edge which fits into the edge channel, the edge of the panel member having a plurality of spaced apart projections which extend from each side of the panel member, the edge channel having a pair of spaced parallel upstanding walls, one of which is taller than the other, each wall having a turned in lip which engages with the projections on the panel member to lock the panel member and the edge
member together.

10. A method substantially as hereinbefore described with reference to the drawings.

11. A panel assembly substantially as hereinbefore described with reference to the drawings.

12. A panel assembly according to any one of claims 2, 8, 9 or 11 wherein the panel member is formed from corrugated metal sheeting.

13. The method of any one of claims 3-7 or 10 wherein the taller sidewall of the edge channel has a projection in the form of a turned in lip at the top thereof.

14. The method of claim 13 wherein one or more of the plurality of projections in the panel member is higher than others of the projections.

15. The method of claim 14 wherein only the one or more higher projections in the panel member can look with the lip of the higher sidewall.

16. A panel assembly according to either one of claims 9 or 12 wherein the projections extending from one side of the panel member form a first row of projections and the projections extending from an opposed side of the panel member form a second row of projections, each row being substantially linear, the first row being positioned higher on the panel member than the second row so that the first row locks with the turned in lip on the tall wall of the edge channel and a second rower locks with the turned in lip on the lower war of the edge channel.

17. A panel assembly according to any one of claims 9, 12 or 16 wherein the height of the taller wall of the edge channel is approximately 20 mm, and the height of the lower wall of the edge channel is approximately 15 mm.

Dated this 7th day of September 2005

John Scholtes Investments (No. 1) Pty Ltd
(ACN 009 792 670)
By their Patent Attorneys
CULLEN & CO.