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IMPROVEMENTS IN THE WEATHERPROOFING OF ROOFS

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(71) Applicant(s)
Clifton Development and Designs Pty Ltd

(72) Inventor(s)
Clifton, Timothy Scott

(74) Agent / Attorney
Michael Buck IP, PO Box 4361, ST LUCIA, QLD, 4067

ABSTRACT

Weatherproofing flashing for roofing having upstanding profiled ribs, the flashing comprising a plurality of first profiles adapted to press fit to the profiled ribs thereby attaching the flashing to the roofing. In one embodiment a weatherproofing flashing is provided in the form of a dry pan 40 attached to roofing 41 of the type having upstanding profiled ribs 42, the dry pan 40 comprising a front wall 43 adapted to extend across the roofing 41, the dry pan further including opposed sidewalls 44 adapted to extend along the roofing, the front wall 43 including a plurality of first profiles 45 (see also figure 7) which are shaped to press fit over the profiled ribs 42 on the existing roofing 41 thereby attaching the dry pan to the roofing.

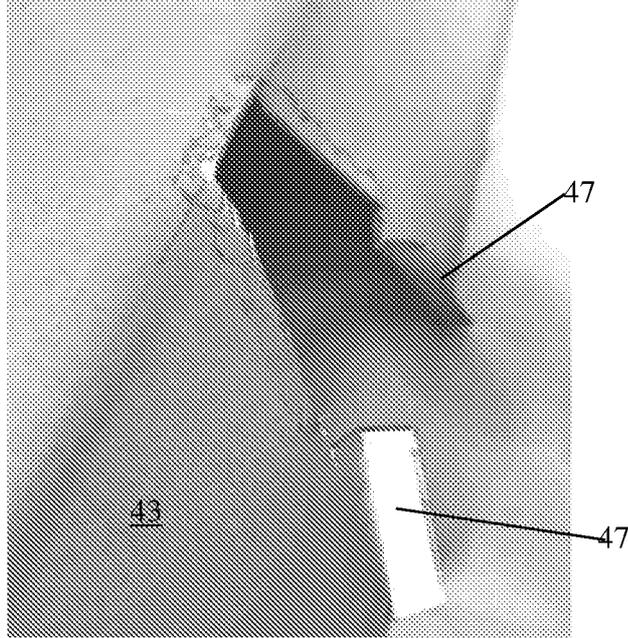


FIG 9 – DRYPAN FIRST PROFILE

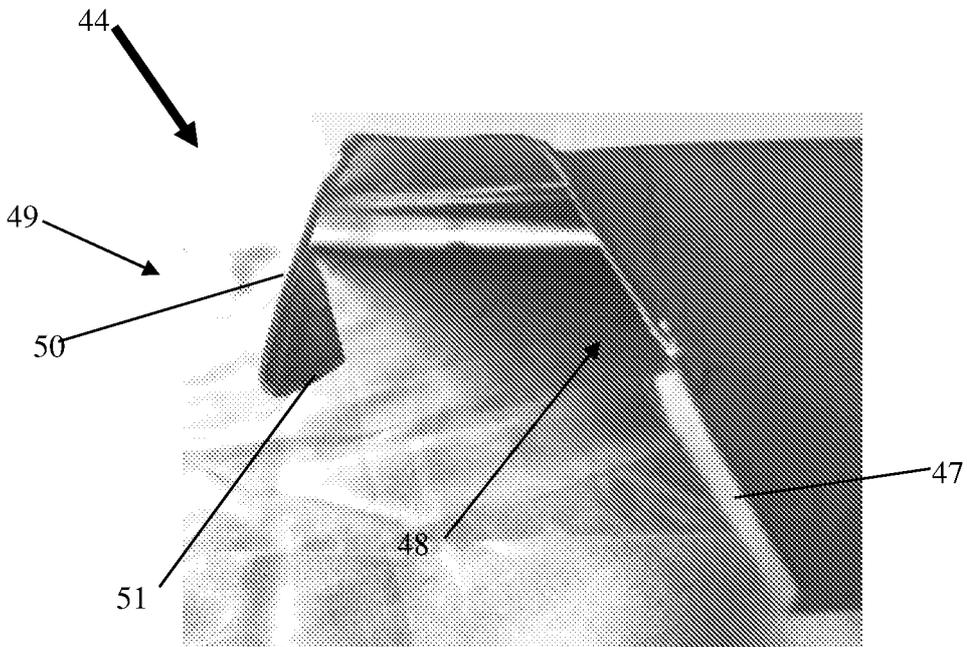


FIG 10 – DRY PAN SIDE WALL PROFILE

IMPROVEMENTS IN THE WEATHERPROOFING OF ROOFS

5 TECHNICAL FIELD

The present invention is directed to improvements in the use of flashing material to weatherproof roofs including roof penetrations extending through a concealed fix type of roof. The invention is particularly directed to a faster method of attaching the flashing material to such roofing. A particularly suitable type of
10 flashing is a dry pan flashing. The roofing is of a particular design having upstanding profiled ribs.

BACKGROUND

15 Any references to methods, apparatus or documents of the prior art are not to be taken as constituting any evidence or admission that they formed, or form part of the common general knowledge.

Roof penetrations comprise openings cut into a roof to allow attachments on the
20 roof to communicate with the interior of the building. A common type of attachment is a skylight to allow light to pass into the interior of the building. The skylight typically includes a solar tube that penetrates through the roof. Another typical device is a roof ventilator such as a “whirlybird”, or a solar powered ventilator at the like. For commercial buildings, roof penetrations are required for
25 larger exhaust ducts, vent stacks, air conditioner exhausts and the like.

The penetrations need to be made weatherproof to prevent rain from seeping into the building. The weatherproofing is often achieved using flashing material.

30 Flashing refers to thin pieces of impervious material installed to prevent the passage of water into a structure from a joint or as part of a weather resistant barrier (WRB) system.

The flashing is usually of a sheet metal such as lead, aluminium, or copper, galvanized steel, stainless steel, zinc alloy, terne (lead/tin alloy), lead-coated copper, or other architectural metals.

5 In commercial buildings or other large roofing areas, it is common for the roof to have only a very slight pitch. The roof is essentially flat with only a slight incline (sometimes only about 1°). To prevent water seeping through overlapping roof sheets, the sheets have a high profile with upstanding ribs. Adjacent sheets overlap over the rib area. The area between the ribs (often called a pan or valley)
10 channels water off the roof.

The ribs have a profile that enables the edge of one roof sheet to overlap the edge of an adjacent roof sheet. The ribs enable the roof sheets to be attached to supporting purlins via screw fasteners or locking clips. This type of roof is known
15 as a concealed fix roof and is very common particularly in commercial roofing. Figure 1 illustrates a typical Prior Art clip lock/ concealed fix roofing sheet 10. Sheet 10 can be of any suitable length (and it is known for the sheet to be 6 m long or more) and will typically have a width of about 400-800 mm. The sheet comprises upstanding profiled ribs 11 which are spaced about 235 mm apart.
20 Each longitudinal edge 12 contains part of a profiled rib such that adjacent sheets can be overlapped in such a manner that it is virtually impossible for water to pass between adjacent overlapping sheets. The relatively flat area 13 between adjacent ribs channels water and this area is usually called a pan or valley. The ribs 11 have an external profile which includes a necked portion 14 which
25 presents opposing shoulders 15. The ribs have an internal profile to enable the sheets to be press locked to clips (not illustrated) which are screwed onto supporting purlins. This arrangement is well-known.

One aspect of the present invention is directed to a better and faster attachment
30 of flashing/s to weatherproof roof penetrations extending through a concealed fix type of roof.

A particular problem in weatherproofing these types of roofs is that the roof is substantially flat making conventional flashing arrangements unsuitable.

As an example, figure 2 illustrates a Prior Art flashing arrangement attempting to weatherproof a skylight 17 extending through a relatively flat concealed fix type of roof. In this particular arrangement, the flashing comprises a substantially flat rectangular tray of thin metal 18 which is pushed underneath the roof as much as possible and is then screwed in place using multiple fasteners. Large amounts of sealant are used to prevent water seeping through the screw holes and seeping between the tray and the roofing sheets. Once the tray is fixed, a hole is cut into the tray and an upstanding sleeve 19 is fitted. A skylight dome 20 can then be attached. This arrangement, while still being relatively common, does not provide reliable weatherproofing of roof penetrations through a relatively flat profiled roof mainly because of water banking up behind the penetration.

For this reason, it is also known to use a type of flashing which is known as dry pan flashing. Figure 2 and figure 3 illustrate Prior Art dry pan flashing. A dry pan flashing is a flashing that covers the roof sheet the width of the penetration and runs from the back of the penetration all the way up the sheet to the ridge 22. When rain falls on the dry pan it simply runs off into the valley either side of the dry pan flashing. This type of flashing is particularly suitable for flat profiled roofs.

The dry pan flashing comprises a plurality of flat metal sheets that are slightly overlapped and then screwed together using multiple fasteners. Figure 4 illustrates a dry pan flashing comprising a first flashing 23 which accommodates the roof penetration (in this case a skylight 24), and a number of additional flat flashing members 25-27 which are attached to each other by multiple fasteners 28. The flashing members also need to be sealed. The fastening and the sealing is an extremely time-consuming and laborious job. This is especially the case if the roof penetration is positioned some distance away from the ridge 22 such that a large number of intervening flashing members (e.g. 25-27 etc) are required. Another disadvantage is that for these larger dry pan flashing assemblies, a large

amount of rain water can pass into the immediate adjacent roof pan/valley which can cause the valley to overflow.

5 Each of the flashing members as well as being screwed and sealed to each other, are also required to be screwed to the roof. Figure 5 illustrates a Prior Art type of dry pan flashing and particularly illustrates multiple screw fastenings 29 which are used to screw the various flashing to the top wall 30 (see figure 1) of each rib. It can be appreciated from figure 1 that this is a very fiddly operation as the width of top wall 30 is not very large and it is quite possible for the screws to not engage
10 into the top wall. It is of course not possible to screw the flashing directly into the much wider pan area between the ribs as this will simply provide an opening in the roof through which water can seep.

15 Thus, while the dry pan flashing arrangement can provide superior weatherproofing on a substantially flat clip together type roof, the extremely time-consuming and laborious requirement with the use of often hundreds of fasteners and kilograms of sealant makes this type of flashing arrangement not very popular with roof installers.

20 There would be an advantage if it were possible to provide a flashing arrangement for a clip together type roof which can weatherproof roof penetrations in a manner similar to that of dry pan flashing but which can be fitted to a roof in a much more convenient manner.

25 There would be a further advantage if it were possible to provide roof flashings or attachments which can be fitted to a roof without the requirement for multiple fasteners.

SUMMARY OF THE INVENTION

According to a broad aspect of the present invention, there is provided a weatherproofing flashing for roofing having upstanding profiled ribs, the flashing comprising a plurality of first profiles adapted to press fit to the profiled ribs thereby attaching the flashing to the roofing.

In a more particular aspect of the present invention there is provided a weatherproofing flashing for roofing having upstanding profiled ribs, the flashing comprising a front wall adapted to extend across the roofing and opposed sidewalls adapted to extend along the roofing, the front wall including a plurality of first profiles adapted to press fit to the profiled ribs thereby attaching the flashing to the roofing.

The roofing typically comprises concealed fixing roofing sheets. An example of this roofing may include *Clip Lok* roofing which is well known and widely used in commercial constructions. Figures 1-4 illustrate known types of clip together roofing.

In this manner, the flashing can be formed with locking profiles to enable it to be push locked to the upstanding profiled ribs on the roof which means that the flashing can be attached without the use of any fasteners.

The flashing suitably comprises a dry pan. The dry pan will typically be formed from thin metal sheet material. There may be circumstances where the dry pan can be formed from plastics material or other types of materials. The dry pan will typically be substantially rectangular when viewed in plan. There may be circumstances where there is an advantage in providing the dry pan with a tapered or alternative configuration when viewed in plan.

The dry pan may be made of a unitary sheet of material. An opening can be formed in the dry pan to accommodate a roof penetration. The opening can be cut into the dry pan either on the roof or the dry pan can be precut off-site.

However, the dry pan may also comprise separate sheets that are attached together to form a particular desirable configuration. As an example, and referring to Prior Art figure 5, the dry pan may comprise three separate sheets 31-33 which
5 can be cut and attached together (usually off-site) and typically to provide an upstanding sleeve or apron.

The front wall of the flashing (for instance dry pan) can be formed integrally and bent downwardly to form the front wall. There may be circumstances where there
10 is an advantage in forming the front wall separately and attaching it to the remainder of the dry pan flashing prior to attachment of the flashing to the roof. There may be circumstances where there is an advantage in having the front wall formed from a number of separate pieces that are attached to the flashing. If the front wall comprises a separate piece, this may be formed from a different type of
15 material. However, it seems most convenient that the front wall forms a bent down edge of the flashing.

The front wall may include a plurality of first profiles adapted to press fit over the profiled ribs of the roof to press lock the flashing to the roof. The first profiles may
20 comprise cutouts in the front wall. Alternatively, the first profiles may comprise separate parts that are subsequently attached to the front wall.

It is also envisaged that the flashing may comprise a locking profile other than on the front wall to press lock the flashing to the roof. As an example, the flashing
25 may include one or more fingers or arms or brackets or something similar which can extend from the remainder of the flashing and press lock against the roof. Therefore, in the broader form of the invention there may be provided a weatherproofing flashing for roofing having upstanding profiled ribs, the flashing comprising a plurality of first profiles adapted to press fit to the profiled ribs
30 thereby attaching the flashing to the roofing.

The number of first profiles will suitably be the same as the number of ribs on the roof that are covered by the flashing. Thus, if the flashing extends over ten ribs, it

is preferred that the flashing comprises ten first profiles such that the flashing can lock to each of the ribs on the roof that are covered by the flashing. It is considered that this will provide the most secure attachment. However, there may be circumstances where the flashing connects to only some of the ribs on the roof.

The shape of the profile will depend on the shape of the rib on the roof to enable the profile to engage with the rib. Suitably, the profile is such that it can engage with a rib on the roof at at least two locations (for instance, on each side of the rib). This will be described in greater detail below.

Suitably each side wall comprises a second profile to attach each side wall to at least part of a profiled rib of the roof. The second profile may comprise a turned in lip on lower edge of each side wall that can engage with part of the rib on the roof.

It is preferred that the second profile extends along the entire length of each side wall such that the entire side wall is attached to the rib on the roof. However, there may be circumstances where the second profile extends only along parts of the side wall or on only one of the sidewalls. It is also envisaged that the second profile might be different on each side wall. It is also envisaged that the second profile may comprise different types of attachments profiles on a said sidewall. It is however considered expedient for the second profile to comprise a longitudinal turned in lip.

The flashing typically includes a rear edge. In one form, the rear edge may comprise a turned up lip or edge the reason for which will be described in greater detail below. In another form, the rear edge may comprise a simple straight edge. In another form, the rear edge may include a turned down rear wall and this may include profiles similar to that of the front wall such that the rear of the flashing can also be snap locked to the roof. It is also envisaged that the rear edge may include a turned down rear wall but this may include larger profiles or differently shaped profiles that can pass over the roof ridge but not engage with the roof ridge.

In a particular embodiment, the flashing comprises a dry pan that can be formed with the first profiles and can be fabricated into the desired size and shape off site. The dry pan may be provided with preformed cutouts, sidewalls, aprons and skirts and the like. The dry pan can be placed on the roof and about the roof penetration and such that the first profiles are aligned with the ribs on the roof and can then be pressed down to press lock the dry pan to the roof.

If the roof penetration is some distance away from the ridge, it may be necessary to provide a number of flashings attached together in a manner not dissimilar to that illustrated in Prior Art figure 3. If this is required, each additional flashing may comprise the second profile on the sidewalls such that the additional flashing can be fitted to the roof ribs. Each additional profile may also include a front wall and/or rear wall which is at right angles and which contains the first profiles such that each additional flashing can be snapped fitted to the roof. Any small gaps between adjacent flashings can be sealed with appropriate sealant.

However, another form of the present invention is directed to improvements to do away with these additional flashings. In this additional form, the invention includes one or more additional roofing sheets containing upstanding profiled ribs and which have a length to extend from the ridge to the weatherproofing flashing containing the roof penetration, and at least one interlocking member having a lower locking means to enable the interlocking member to be press locked to the upstanding ribs on the existing roof, and an upper locking means to enable the interlocking member to be press locked into the ribs on the one or more additional roofing sheets.

In this form of the invention, the additional flashings that extend from the ridge to the first flashing that contains the roof penetration are not required. Instead, ordinary additional roofing sheets (typically the same as the roofing to which the flashing is applied) can be cut to length to extend from the ridge of the roof and onto the first flashing and can then be pushed locked to the existing roof via the interlocking member or members. Again, there will be no requirement for multiple fasteners and no or very little requirement for the application of sealant.

The interlocking member may comprise at least one lower profile adapted to press lock over a rib on the existing roof, and at least one upper profile adapted to be pressed into the rib profile on the additional roofing sheets.

5

The lower profile and/or the upper profile may comprise separately formed locking clips. The interlocking member may include a connecting member to which the locking clips can be attached.

10 It is also envisaged that the interlocking member may comprise a unitary (possibly extruded) member containing integrally formed profiles.

Suitably, the interlocking member will have sufficient upper profiles to lock into each rib of the additional roofing sheets. There may be circumstances where
15 there is an advantage in locking into only some of the ribs. The interlocking member may have any suitable length. The interlocking member may be length adjustable if desired. The interlocking member may have adjustment means to allow the upper and/or lower profiles to be adjustably mounted to the connecting member. For wider flashings where a number of additional roofing sheets may be
20 required, it may be necessary to have two or more interlocking members in linear alignment to enable the additional roofing sheets to be locked down to the existing roof via the interconnecting member or members. If the interlocking members are in linear arrangement, they may be connected together or not.

25 It is envisaged that the additional roof sheets will be connected to the existing roof via the interconnecting members at spaced apart locations. The spacing will be determined, inter alia, by local building regulations. It is however envisaged that the spacing will typically be between 20cm-2.5m. This can of course vary to suit with the closer spacing required for high performance roofs such as in a cyclone
30 prone area.

While it is considered suitable for the additional roofing sheets to be the same as the existing roofing, there may be circumstances where it is desirable for the

additional roofing sheets to be different. If so, the additional roofing sheets should contain some form of profile to enable the interlocking member to lock against the additional roofing sheets. Thus, instead of existing roofing sheets, there may be circumstances where there is an advantage in providing proprietary or specially designed additional roofing sheets or cover members to form the dry pan from the roof penetration to the ridge.

In another form, the invention resides in an interlocking member having a lower locking means to enable the interlocking member to be press locked to upstanding ribs on a lower roof sheet, and an upper locking means to enable the interlocking member to be press locked into ribs of an upper roofing sheet.

In yet another form of the invention there is provided an interlocking member having a lower locking means to enable the interlocking member to be press locked to a upstanding profiled ribs on a lower roof sheets, and locking means to enable an upper cover member to be locked to the interlocking member.

In this additional form of the invention, the cover member need not comprise traditional roofing sheets.

In yet another form of the invention there is provided a cover member comprising a plurality of locking profiles to enable the cover member to be press locked over the ribs of a roof of the type described above. In this form of the invention, the interlocking member is not separate and can form part of the cover member, or be permanently attached to the cover member.

Another aspect of this form of the invention is that the cover member may comprise something other than that used as a dry pan. For instance, the cover member may comprise a ridge capping that can be press fitted to the roofing sheets by being provided with profiles (such as cutouts). Thus, it is no longer necessary to screw the ridge capping to the roofing sheets.

The cover member may also comprise an apron flashing provided with profiles as described in the specification, which can replace a conventional apron flashing as illustrated as reference numeral 22 in figure 3 and can be filled without the need for multiple fasteners.

5

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred features, embodiments and variations of the invention may be discerned from the following Detailed Description which provides sufficient information for those skilled in the art to perform the invention. The Detailed Description is not to be regarded as limiting the scope of the preceding Summary of the Invention in any way. The Detailed Description will make reference to a number of drawings as follows:

10

Figure 1. Illustrates a Prior Art commercial concealed fix roof panel profile.

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Figure 2. Illustrates a Prior Art roof penetration which is susceptible to leakage.

Figure 3. Illustrates a Prior Art dry pan flashing assembly to weatherproof a roof penetration in the form of a skylight.

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Figure 4. Illustrates a different Prior Art dry pan flashing assembly for a skylight and which particularly illustrates the multiple fastenings required.

Figure 5. Illustrates a different Prior Art dry pan flashing assembly and particularly illustrates the dry pan being formed from separate members attached together.

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Figure 6. Illustrates a dry pan according to an embodiment of the invention and attached to a concealed fix roof.

Figure 7. Illustrates the dry pan of figure 6 removed from the roof.

Figure 8. Illustrates in close-up one of the first profiles on the dry pan to enable the dry pan to be press fitted to the roof.

Figure 9. Illustrates the first profile of figure 8 from a different angle.

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Figure 10. Illustrates the side wall profile of the dry pan according to the embodiments of the invention.

Figure 11. Illustrates the dry pan attached to a roof and additional roofing sheets extending from a ridge to the dry pan.

Figure 12. Illustrates part of the interlocking members to enable the additional roofing sheets to be press fitted to the existing roof via the interlocking members.

Figure 13. Illustrates a pair of interlocking members attached to existing roof and prior to attachment of the additional roofing sheets to the interlocking members.

Figure 14. Illustrates an interlocking member.

Figure 15. Illustrates in close-up the attachment of the interlocking member to the existing roof rib.

Figure 16. Illustrates a side view of the additional roofing sheets attached to the roof via the interlocking members and illustrating the gap between the existing roof and the additional roofing sheets.

Figure 17. Illustrates a separate image protector which can be attached over the edge to cover the gap illustrated in figure 16.

Figure 18. Illustrates the edge protector and particularly illustrating the profile of the edge protector.

Figure 19. Illustrates one type of ridge capping containing profiles to enable the ridge capping to be snap locked to existing roofing.

Figure 20. Illustrates the ridge capping of figure 19 snap locked in position.

Figures 21-22. Illustrate apron flashing according to an embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring initially to figure 6, there is illustrated a weatherproofing flashing according to an embodiment of the invention and in the form of a dry pan 40 attached to roofing 41 of the type having upstanding profiled ribs 42, the dry pan 40 comprising a front wall 43 adapted to extend across the roofing 41, the dry pan further including opposed sidewalls 44 adapted to extend along the roofing, the front wall 43 including a plurality of first profiles 45 (see also figure 7) which are shaped to press fit over the profiled ribs 42 on the existing roofing 41 thereby attaching the dry pan to the roofing.

In the embodiment, the existing roofing is a concealed fix type roofing the profile of which is illustrated in figure 1. This type of roofing has upstanding ribs 11

formed with a neck portion 14 which defines opposed shoulders 15 and it is the shape of the ribs 11 that enables the dry pan to be snapped fitted to the existing roofing via ribs 11. The invention is suited to all types of roofs having ribs to which the flashing can be press fitted onto. These roofs include roofs that are screwed onto supporting purlins, roofs that are clipped onto supporting roofs and the like. How the existing roof is attached to the supporting purlins is not part of the present invention.

The first profiles 45 are particularly illustrated in figure 8 and figure 9 and it can be seen that the profile includes a larger upper head portion 46 below which extend short pressed out fins 47 (see particularly figure 9). When the dry pan is pushed over the existing roofing, a particular roofing rib 11 will enter into profile 45 and push the fins 47 out of the way until such time as the shoulders 15 (see figure 1) are pushed past the fins at which stage the fins will move back into position and lock underneath shoulders 15. The profile locks against each rib at two locations being each of the shoulders on the rib.

The dry pan 40 is designed such that each rib of the existing roofing that is covered by the dry pan matches with a profile 45 on the dry pan such that the dry pan will press fit to all available ribs. This provides the best possible securement to the existing roof.

Dry pan 40 in the particular embodiment is illustrated as a rectangular metal sheet but this is illustrative only of the invention and the dry pan can have any other desirable size and shape. Also, dry pan 40 in the particular embodiment is illustrated as having a smooth top wall but it is more usual for the top wall to contain a pre-cut opening and perhaps even upstanding sleeves or other cut-outs or formings depending on the type of penetration that is to be made weatherproof.

The dry pan contains opposed sidewalls 44. These sidewalls have a particular profile which is best illustrated in figure 10. The side wall profile has an inner part 48 which is similar to the profiles 45 on the front wall of the dry pan in that part 48 contains one of the fins 47. The other side of the side wall (49) contains a short

depending wall 50 having a turned in lip 51. Lip 51 will engage against one of the shoulders 15 (see figure 1) of the roof rib to attach the side wall to the rib when the dry pan is pressed into engagement on the existing roof.

5 Thus, dry pan 40 is attached to the existing roof primarily via the first profiles 45 on the front wall 43 but also via the turned in lip 51 on each side wall. This of course requires the size of the dry pan to be carefully determined such that the side walls align with respective upstanding ribs on the existing roof.

10 In the particular embodiment, dry pan 40 (see figure 12) has a rear edge with a turned up lip 70. When the top roof panels 52 are snap locked in place, lip 70 can press up against the bottom of panels 52 to close any gap there between which may otherwise allow ingress of vermin and weather.

15 Figure 11 illustrates another improvement which forms an embodiment of the invention and which greatly facilitates the use of dry pan flashing. Referring initially to figure 3 and figure 4, these illustrate that to provide proper weather proofing, the dry pan flashing needs to extend all the way from the roof penetration to the ridge 22. Sometimes, this means that the flashing needs to
20 extend several metres between the roof penetration to the ridge. This requires the use of multiple flashings 25-27 etc. (see figure 4) and an enormous number of screw fastenings and sealant.

25 Figure 11 illustrates an improvement where the additional flashings are no longer required and the only flashing required is the "original" dry pan through which the roof penetration passes. This dry pan 40 is the one described previously and which can be press fitted to the existing roof. Instead of additional flashings and large number of screw fastenings and sealant, the arrangement of the embodiment of the invention uses additional roofing sheets 52 which will typically
30 be the same as the existing roofing sheets. These additional roofing sheets 52 can be cut to length such that the roofing sheets extend from a ridge (not illustrated) to overlap the dry pan 40, this being illustrated at least in figures 11 and 12. This means that any water falling in this area will be carried by the

additional roofing sheets 52 onto the dry pan 40. There is little or no possibility of water forming behind dry pan 40 which is a significant problem especially with the flashing arrangement is illustrated in figure 2.

5 These additional roofing sheets can also be securely fitted without the need for any fasteners/sealant. This is achieved by the use of interlocking members 35. An interlocking member 35 is illustrated at least in figure 14. The interlocking member 35 is designed to push lock over the upstanding ribs of the existing roof and enables the additional roofing sheets to be push locked onto the interlocking
10 member thereby locking the roofing sheets relative to the existing roof.

This is achieved by providing the interlocking member with a lower locking means in the form of lower locking clips 53 which have a profile to push lock over the top of the ribs of the existing roof. In particular, and referring to figure 14, the locking
15 clips 53 comprise a pair of diverging sidewalls 54 each terminating with a turned in lip 55. These lips engage underneath the shoulders 15 in the rib profile of the existing roof (the shoulders illustrated in figure 1). Specifically, as the clip is pushed on to the upstanding ribs, the sidewalls are initially pushed apart and when the turned in lips 55 extend below shoulders 15, the lips spring back to a
20 position where they engage against the shoulders 15. Figure 15 particularly illustrates locking of these clips to the existing roof.

The interlocking member further contains a connecting member 56 to which the various clips 53 can be attached by any suitable means. The clips are spaced
25 apart by the same spacing between the upstanding ribs on the existing roof. It may be necessary to adjust the distance between adjacent clips.

Figure 13 illustrates two interlocking members 35 clipped to existing roofing ribs.

30 The interlocking member 35 further contains upper locking means also in the form of differently profiled locking clips 57 these being best illustrated in figure 14. These clips 57 have a profile to engage into the interior of a rib profile of an upper roof sheet to lock the roof sheet to the clip. As the roof rib profile can be of

conventional design, it is usual for the upper clips to be of known design and attached to the connecting member 56. Again, some adjustments may be necessary. To provide greater strength and securement, the upper clips and the lower clips are on top of each other.

5

In use, once the dry pan 40 has been placed in position and locked to the existing roof ribs, the distance between the rear of the dry pan and the ridge (not illustrated) is measured and the additional roof sheets are cut to length (or already pre-cut). Depending on the width of dry pan 40, two or more additional roof sheets may need to be in a side-by-side arrangement. A suitably sized interlocking member 35 is snap locked onto the existing roof between dry pan 40 and the ridge. The interlocking members 35 will be spaced apart by distance depending on building requirements. If the width of dry pan 40 is a relatively large, it may be necessary to use two or more interlocking members in linear alignment.

10

Once the interlocking members have been fitted to the existing roof (see for instance figure 13), the additional roof sheets can be laid on top of the interlocking members and pressed down to lock against the upper clips 57. It can be seen that no screw fasteners are required and no sealant is required.

15

Referring now to figure 16, the additional roof sheets 52 have been locked relative to the existing roof 41 via the interlocking members 35. It can be seen however that there is a visible gap 58 between the additional roof sheets 52 and existing roof 41 which may enable water to pass into the area underneath roof sheets 52 which is highly undesirable. Additionally, dirt, debris and vermin can also pass into this area.

20

To prevent this, one aspect of the present invention provides an edge protector 59 which is best illustrated in figure 18 and figure 17. The edge protector 59 comprises an elongate metal member formed with a top wall 60 a longer outer side wall 61 containing a turned in lip 62 and a shorter internal side wall 63 also containing a turned in lip 64.

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The design of the edge protector 59 enables it to press fit over the edge of the additional roofing sheet 52 with turned in lip 64 engaging against a shoulder in a rib of the additional roofing sheet, and turned in lip 62 engaging against the shoulder in a rib of the existing roofing. Figure 17 illustrates the edge protector 59 in place. By being clipped both to the additional roofing sheet and the existing roofing, the gap 58 is completely closed and there is no possibility of the edge of the additional roofing sheet flapping particularly under high wind conditions.

Another aspect of the present invention is directed to the weatherproof flashing comprising a ridge capping 65 which is able to be press fitted onto the ribs of a roof. An example of such a ridge capping is illustrated in figure 19, and figure 20 illustrates the ridge capping 65 attached to a roof. The ridge capping includes a front wall 66 adapted to extend across the roofing and front wall 66 is provided with a plurality of first profiles 67 adapted to press fit to profiled ribs on the roof. The profiles 67 are identical to profiles 45 in the dry pan and can be formed in the same manner by cutting and punching the desired profile into the front wall. Of course, other ways of providing the profile are envisaged including providing a separate front wall which can be attached to the remainder of the ridge capping. The end wall 68 of the ridge capping is provided with a simple cut-out portion to fit over the last rib. This could also contain part of a profile such that the end portion can lock against at least one side of the rib.

Figures 21 and 22 illustrate another embodiment of the invention which comprises apron flashing 80 formed with profiled cutouts 81 the cutouts being similar to that described above which enables the flashing to be snap fitted to the roof. The upstanding skirt 82 of the apron can be fitted to the wall in a conventional manner.

In use, once the roof penetration dimensions are taken, a suitably shaped and sized dry pan can be manufactured. Once the distance between the roof penetration and the ridge is measured, suitable lengths of additional roofing sheets can be cut. The number of required interlocking members can be calculated. The parts can then be transported to the roof. The dry pan can be

snapped fitted to the roof with the penetration extending through the dry pan. The required number of interlocking members can then be snapped to the existing roof between the dry pan and the ridge. The additional roof sheets can then be snapped fitted to the interlocking members. The edge protectors can then be snapped fitted along each edge. If required, a ridge apex flashing can be snapped fitted in position.

The entire arrangement can be done without any screw fasteners being required or with only a fraction of the number of screw fasteners required. Very little (if any) sealant is required. The dry pan can be assembled very quickly to provide effective weather proofing to roof penetrations.

Another advantage is that all the components can accommodate expansion of the existing roof during temperature fluctuations.

15

USE FOR THE INVENTION

The above description identifies at least one specific, substantial and credible use for the invention in the ability to improve the weather proofing of a roof penetration using a dry pan type flashing technique.

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In compliance with the statute, the invention has been described in language more or less specific to structural or methodical features. The term “comprises” and its variations, such as “comprising” and “comprised of” is used throughout in an inclusive sense and not to the exclusion of any additional features. It is to be understood that the invention is not limited to specific features shown or described since the means herein described comprises preferred forms of putting the invention into effect. The invention is, therefore, claimed in any of its forms or modifications within the proper scope of the appended claims appropriately interpreted by those skilled in the art.

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Throughout the specification and claims (if present), unless the context requires otherwise, the term "substantially" or "about" will be understood to not be limited to the value for the range qualified by the terms.

- 5 Any embodiment of the invention is meant to be illustrative only and is not meant to be limiting to the invention. Therefore, it should be appreciated that various other changes and modifications can be made to any embodiment described without departing from the spirit and scope of the invention.

The claims defining the invention are as follows:

1. A weatherproofing flashing for a roof having upstanding profiled ribs, the flashing comprising a plurality of first profiles adapted to press fit to the profiled ribs thereby attaching the flashing to the roofing.
2. The flashing as claimed in claim 1, wherein the flashing comprises a front wall adapted to extend across the roofing and opposed sidewalls adapted to extend along the roofing, the front wall including a plurality of first profiles adapted to press fit to the profiled ribs thereby attaching the flashing to the roofing.
3. The flashing as claimed in claim 2, wherein at least one said sidewall includes a sidewall profile adapted to press fit to a said profiled rib.
4. The flashing as claimed in claim 1 or claim 2, comprising dry pan flashing.
5. The flashing as claimed in claim 4, including additional roofing sheets extending between ridge capping and the dry pan flashing.
6. The flashing as claimed in claim 5, wherein the additional roofing sheets have upstanding profiled ribs and are press fitted relative to the roof via one or more interlocking members.
7. The flashing as claimed in claim 5 or claim 6, comprising an edge protector attached to at least one longitudinal edge of at least one said roofing sheet.
8. The flashing of claim 7, wherein the edge protector comprises an elongate member adapted to snap fit to the longitudinal edge of the roofing sheet.

9. The flashing as claimed in claim 6, wherein at least some of the interlocking members comprise a lower locking means to enable the interlocking member to be press locked to at least one upstanding profiled rib on a lower roof sheet, and upper locking means to enable an upper additional roofing sheet to be press locked to the locking means.

10. The flashing as claimed in claim 1 comprising ridge capping.

11. The flashing as claimed in claim 1 comprising apron flashing.

12. The flashing as claimed in any one of the preceding claims, wherein the flashing weatherproofs at least one roof penetration.

13. The flashing as claimed in claim 10, wherein the penetration comprises a skylight, a ventilation outlet, or a ventilation stack.

11. A method of installing weatherproofing about a roof penetration comprising snap fitting a dry pan to the roof and about the penetration, snap fitting a required number of interlocking members to the existing roof between the dry pan and a ridge, snap fitting additional roof sheets to the interlocking members, and snap fitting edge protectors along each edge of the additional roof sheets.

12. The method as claimed in claim 11, wherein the dry pan comprises a front wall adapted to extend across the roofing and opposed sidewalls adapted to extend along the roofing, the front wall including a plurality of first profiles adapted to press fit to the profiled ribs thereby attaching the flashing to the roofing.

13. The method as claimed in claim 11 or claim 12, wherein the interlocking member comprises a lower locking means adapted to press fit over the profiled rib of a roof sheet, and an upper locking means adapted to enable a second roof sheet to be press fitted to the upper locking means.

14. An interlocking member adapted to be press fitted over at least one upstanding profiled rib on a roof sheet and to enable a second roof sheet to be press fitted to an upper part of the interlocking member, the interlocking member comprising a lower locking means adapted to press fit over the profiled rib of a roof sheets, and an upper locking means adapted to enable a second roof sheet to be press fitted to the upper locking means.

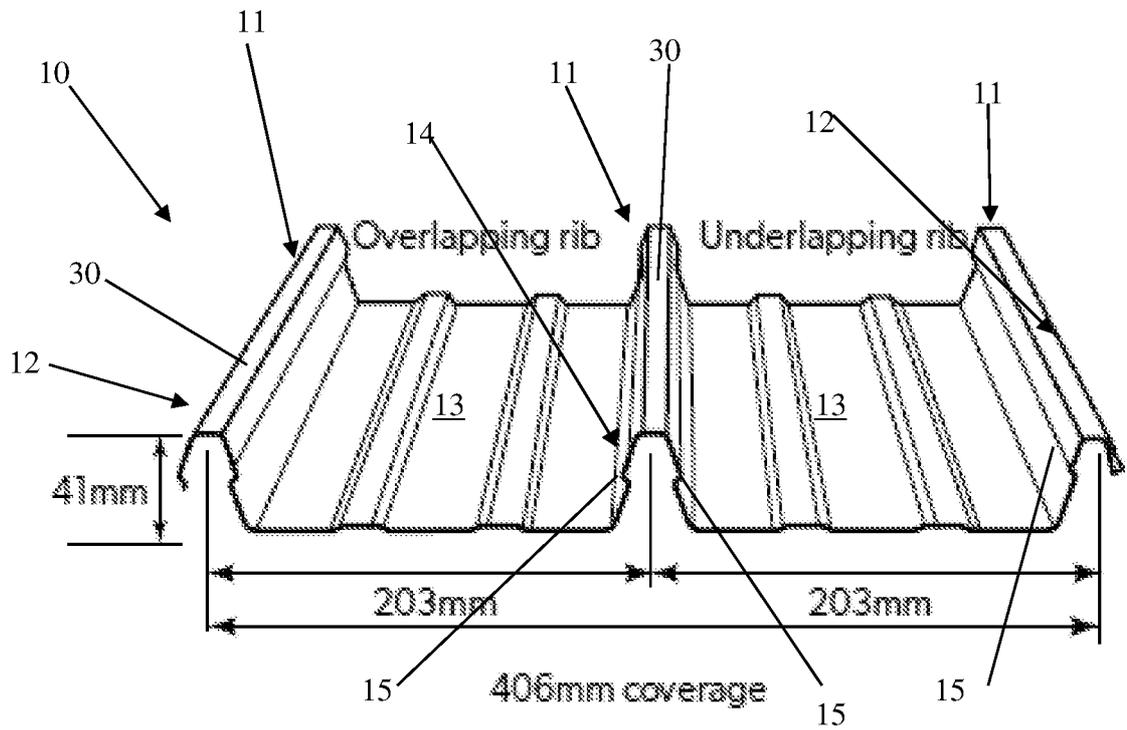


FIG 1 - CLIP LOCK ROOFING

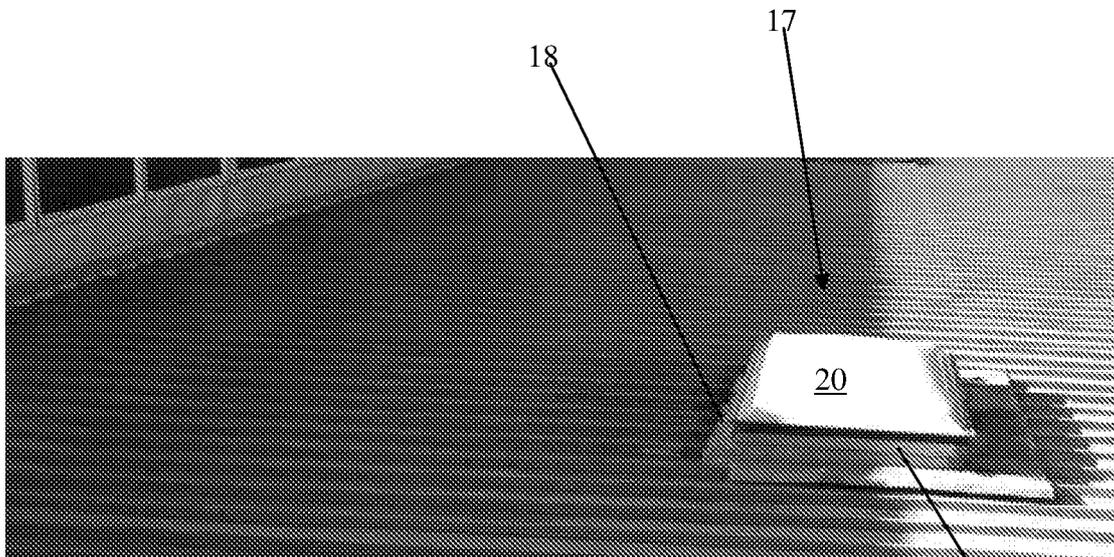


FIG 2 PRIOR ART ROOF PENETRATION

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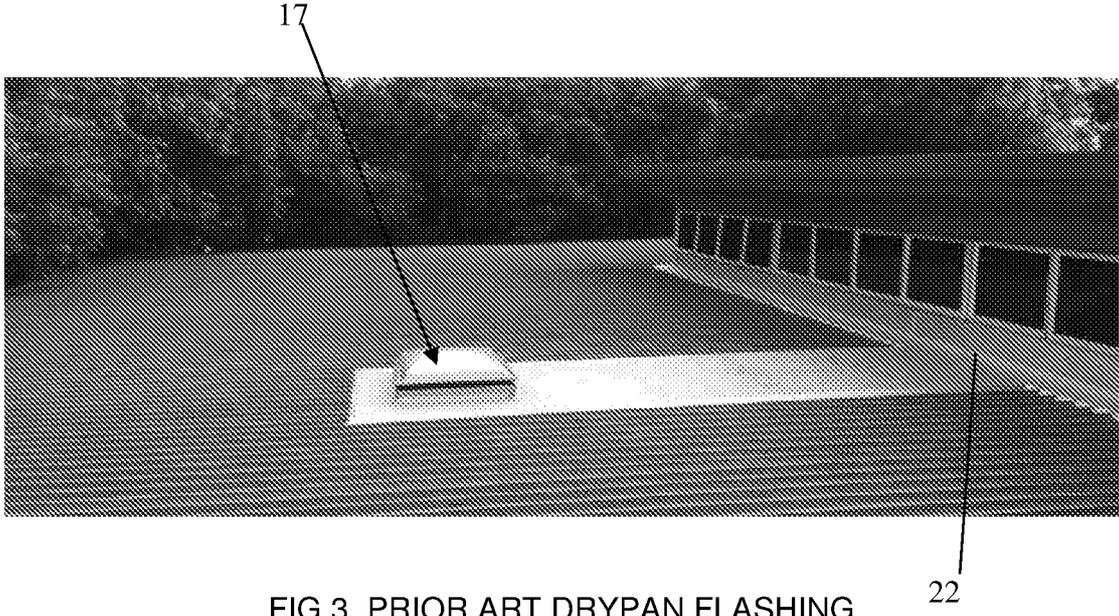


FIG 3 PRIOR ART DRYPAN FLASHING

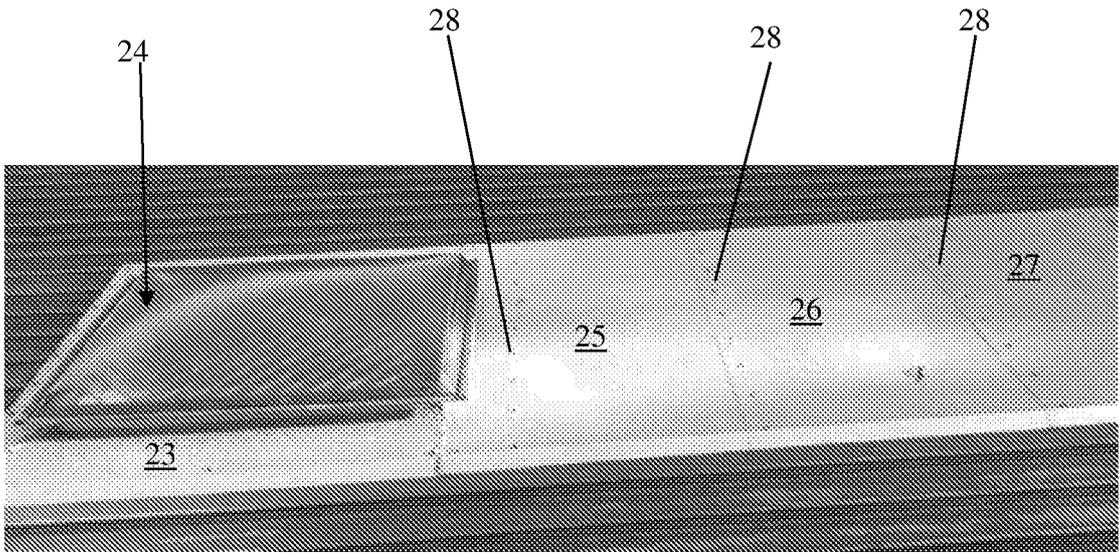


FIG 4 - PRIOR ART DRYPAN SHOWING MULTIPLE FASTENINGS

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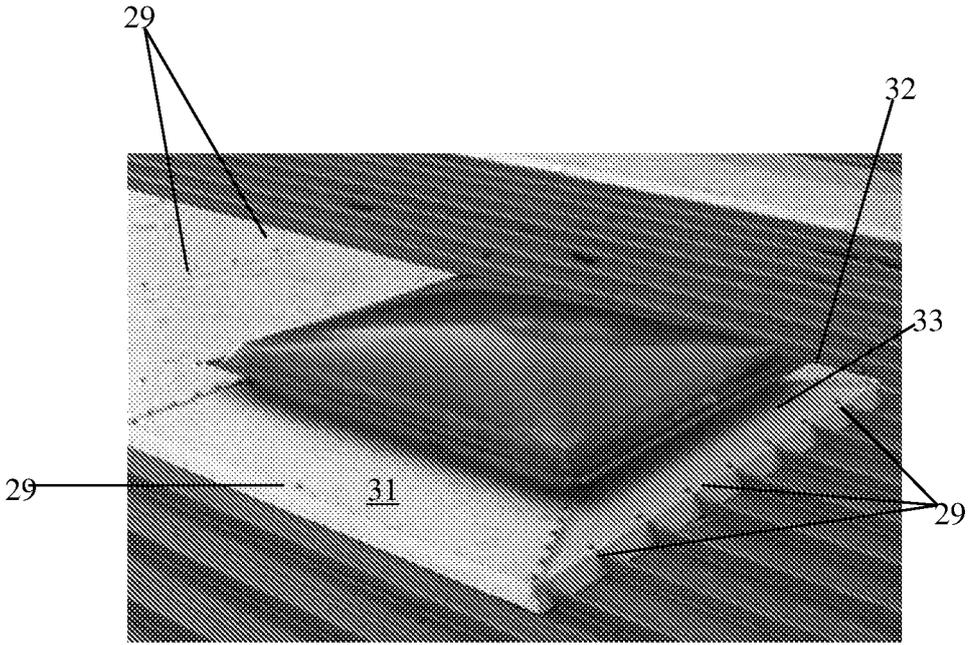


FIG 5. DRY PAN MADE FROM MULTIPLE PARTS

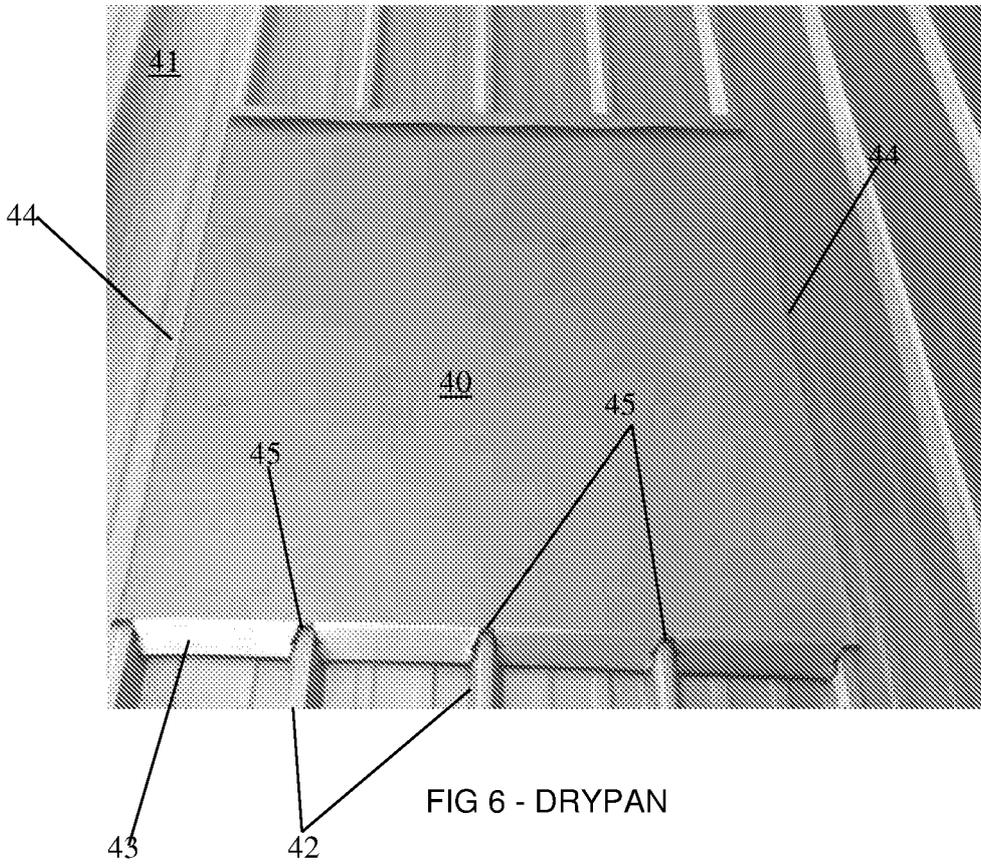


FIG 6 - DRYPAN

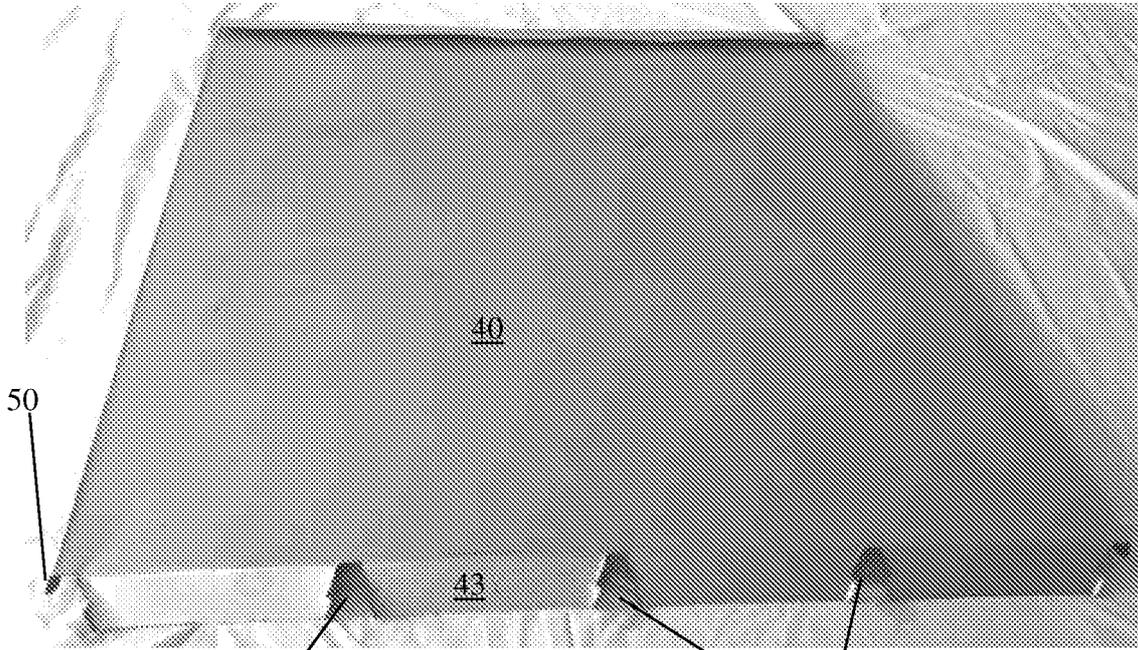


FIG 7 - DRYPAN

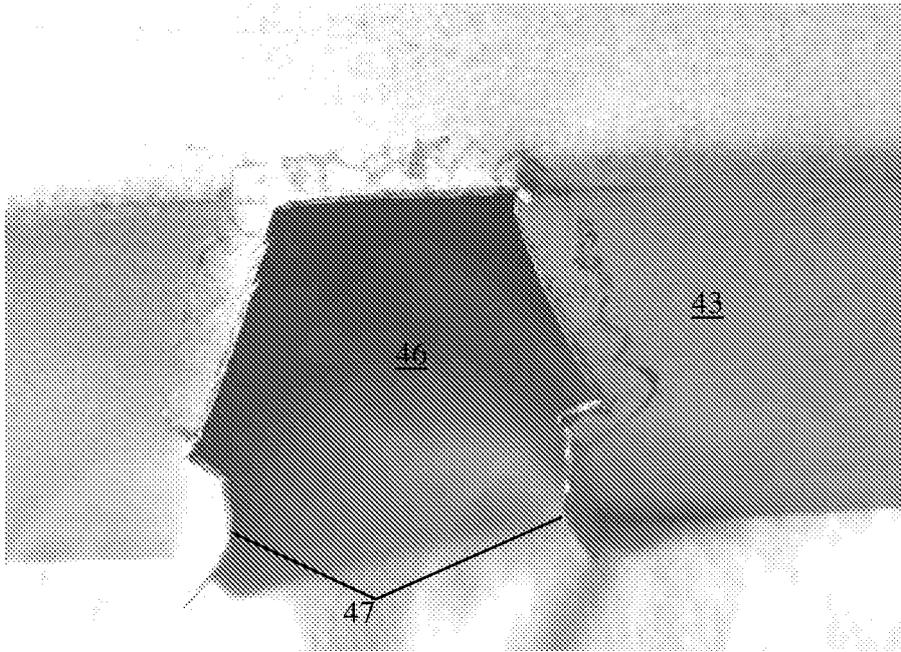


FIG 8 - DRYPAN FIRST PROFILE

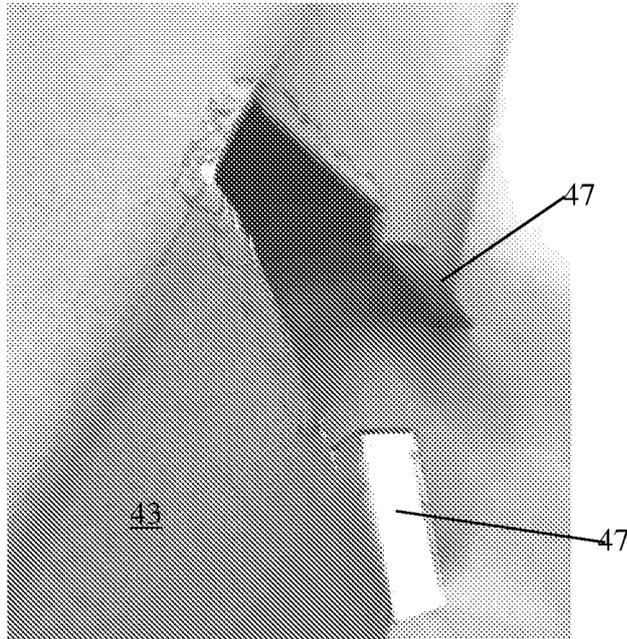


FIG 9 - DRYPAN FIRST PROFILE

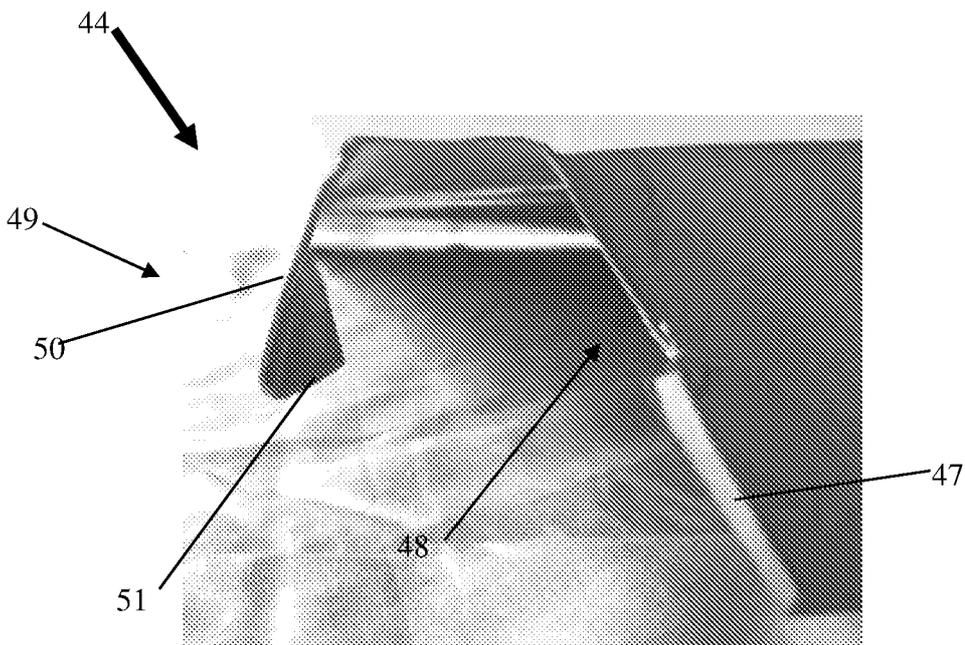


FIG 10 - DRY PAN SIDE WALL PROFILE

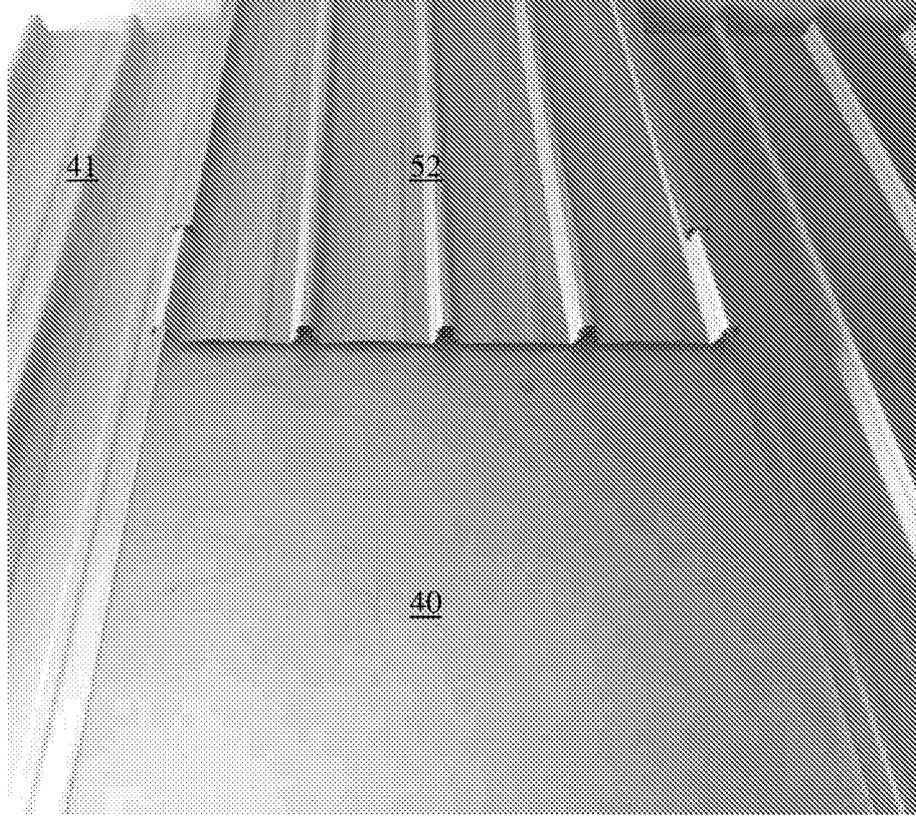


FIG 11

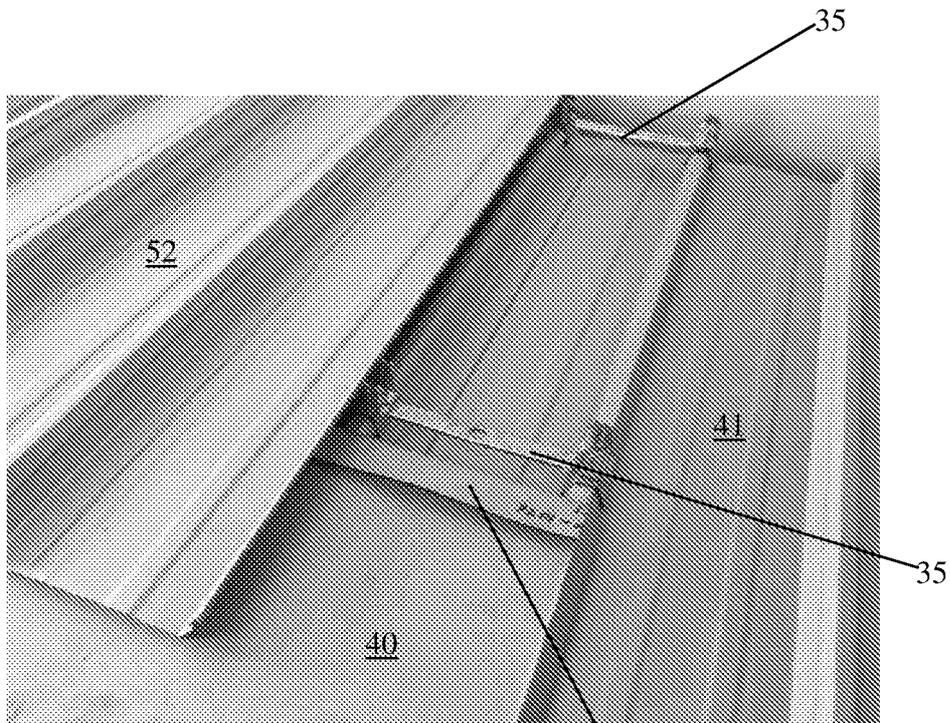


FIG 12

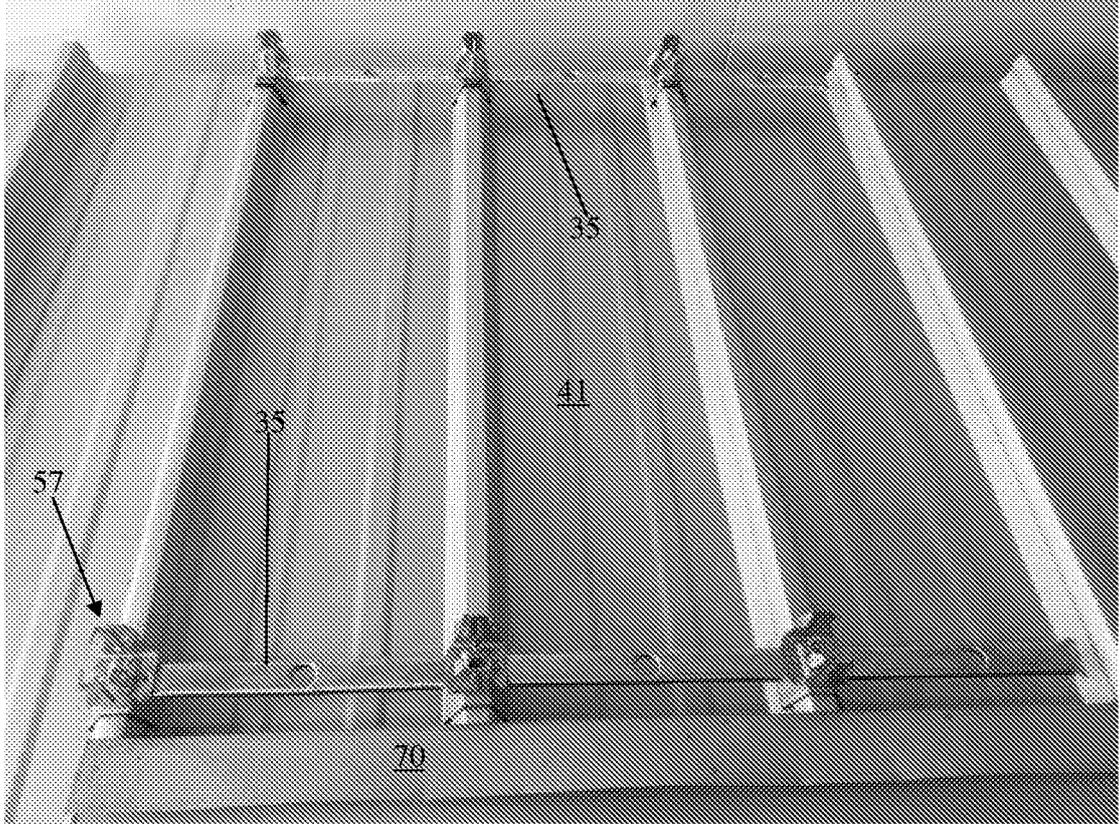


FIG 13

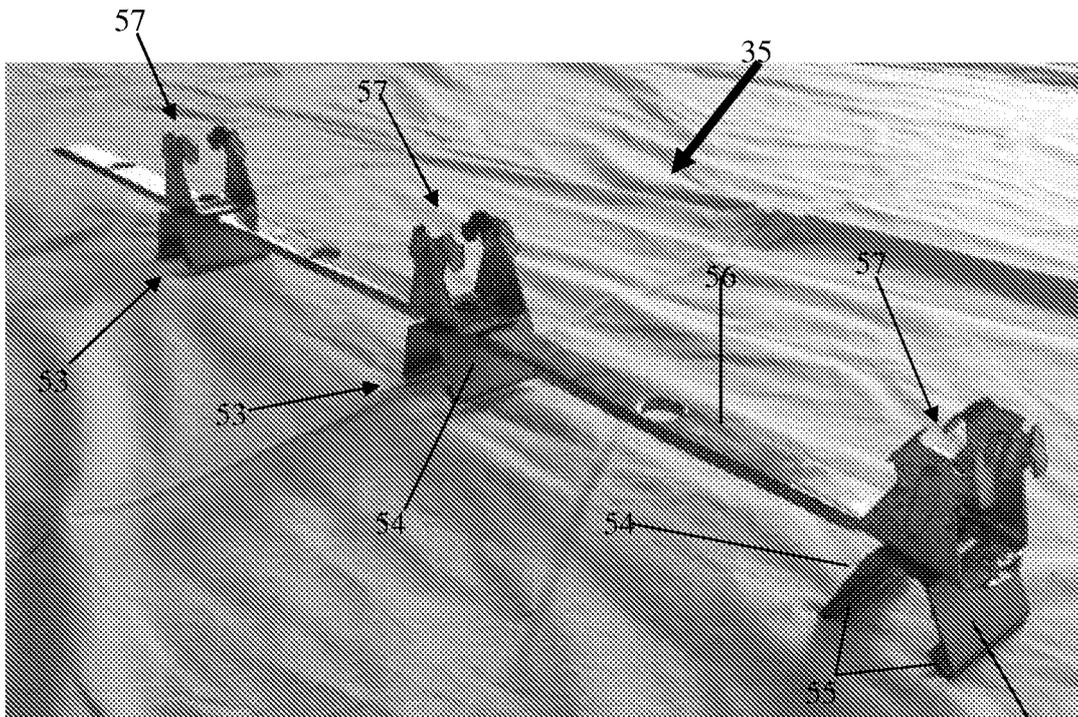
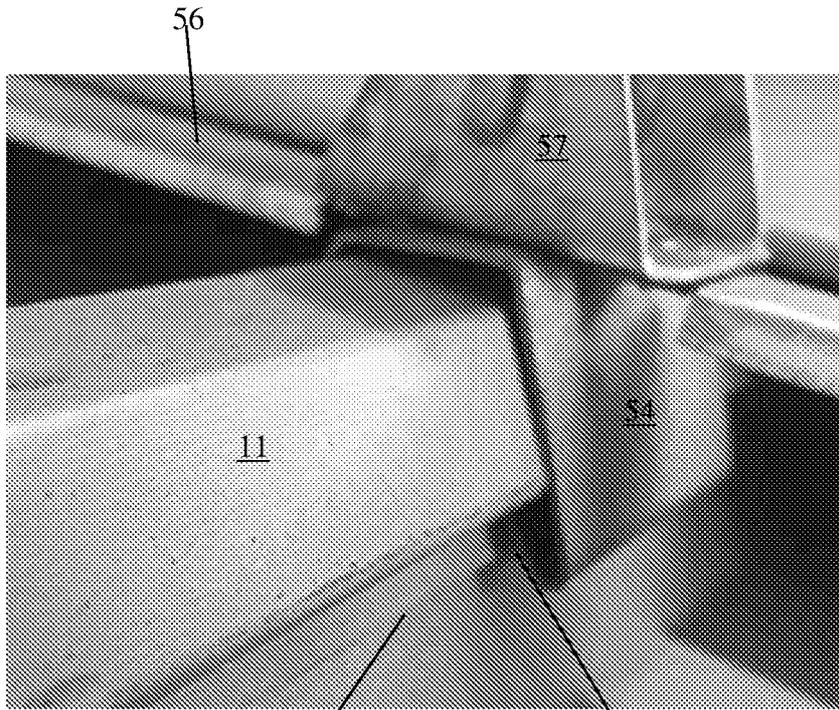
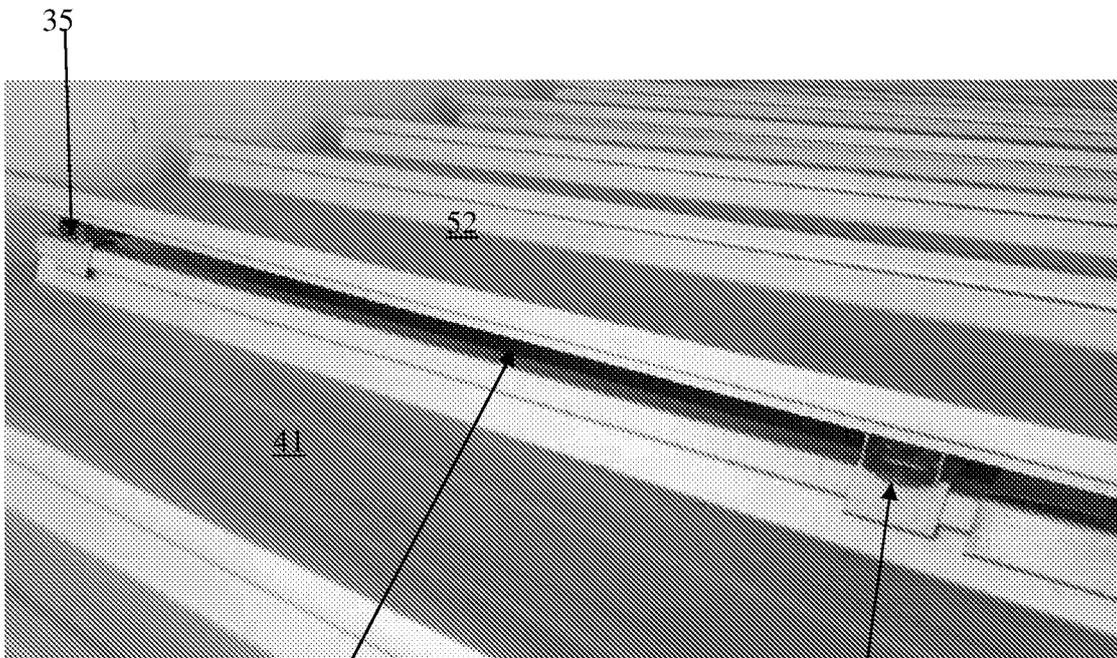


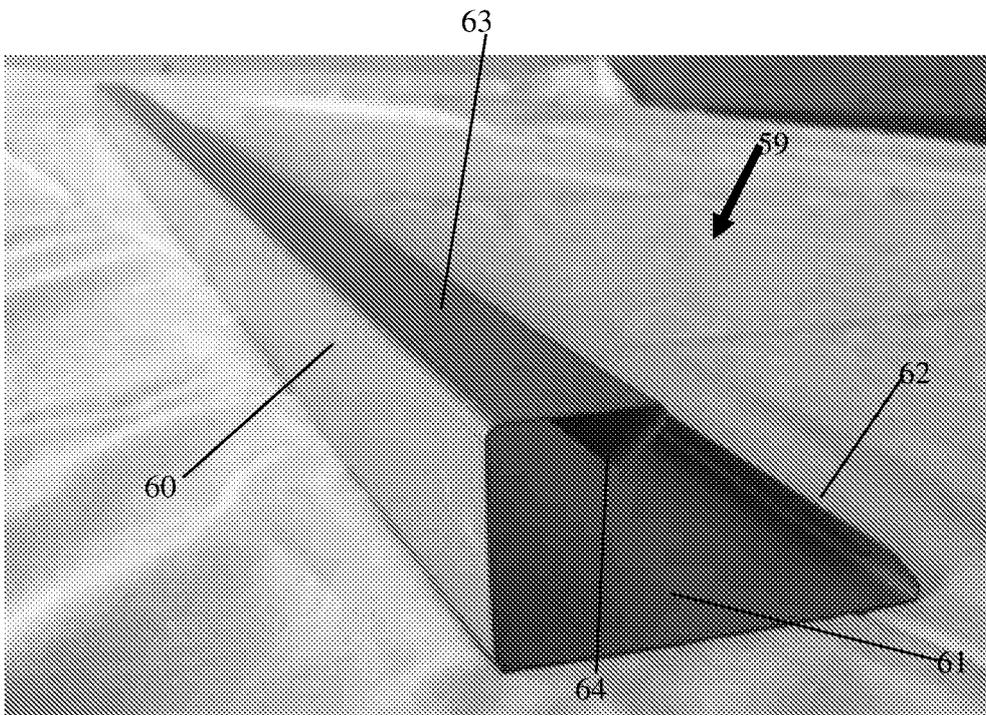
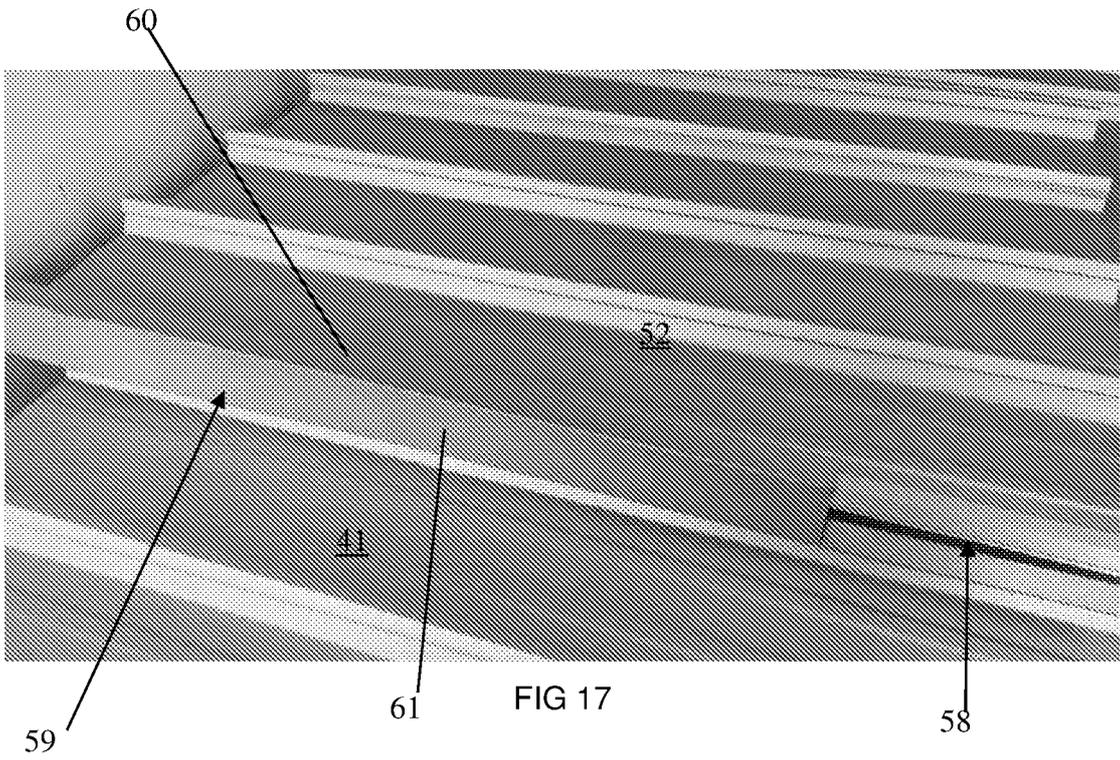
FIG 14 - INTERLOCKING MEMBER



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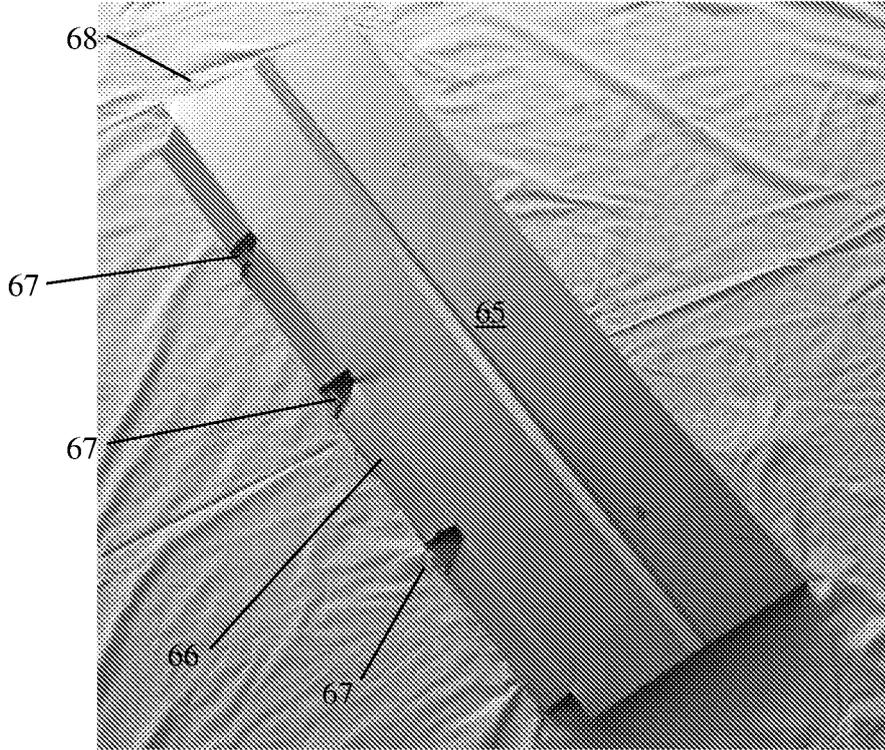


FIG 19 – RIDGE CAPPING

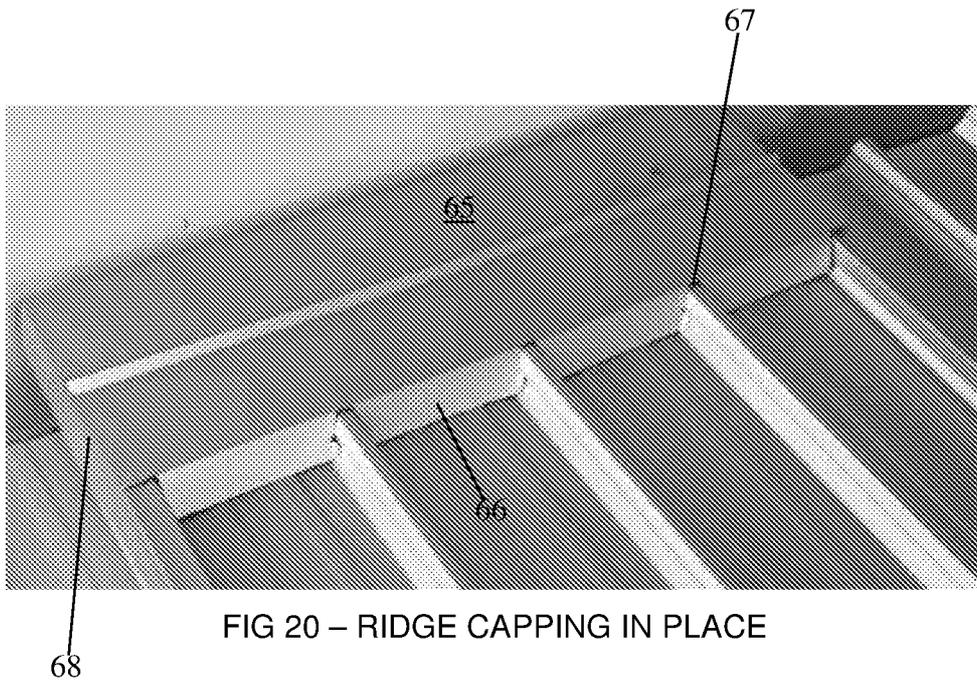


FIG 20 – RIDGE CAPPING IN PLACE

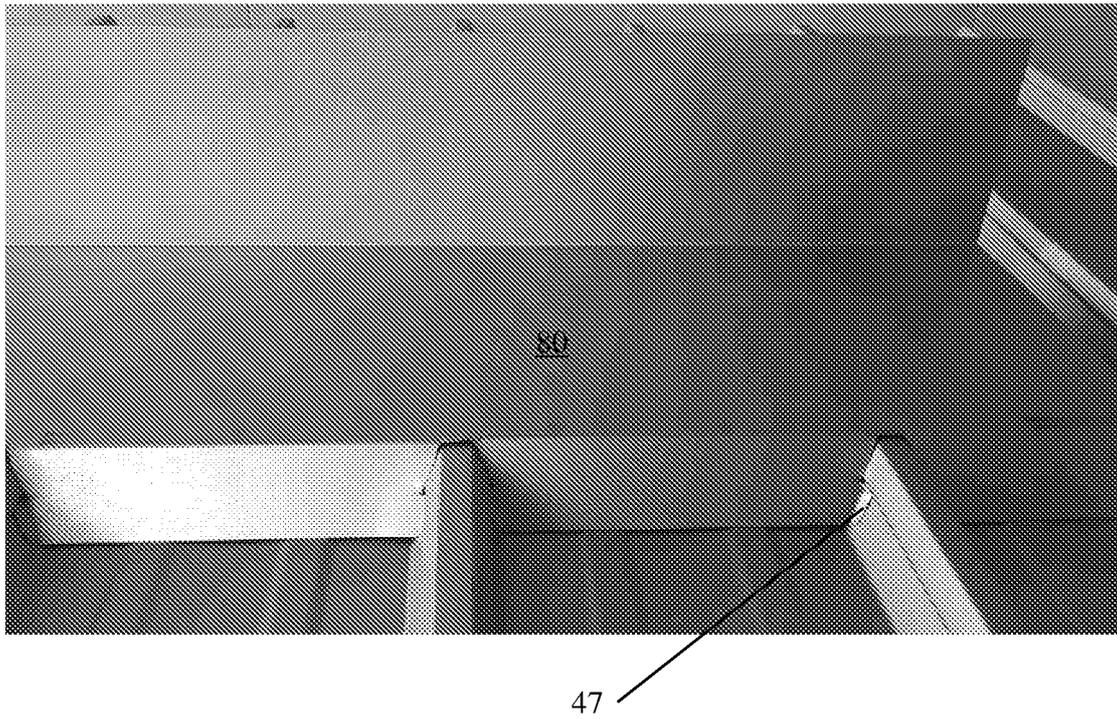
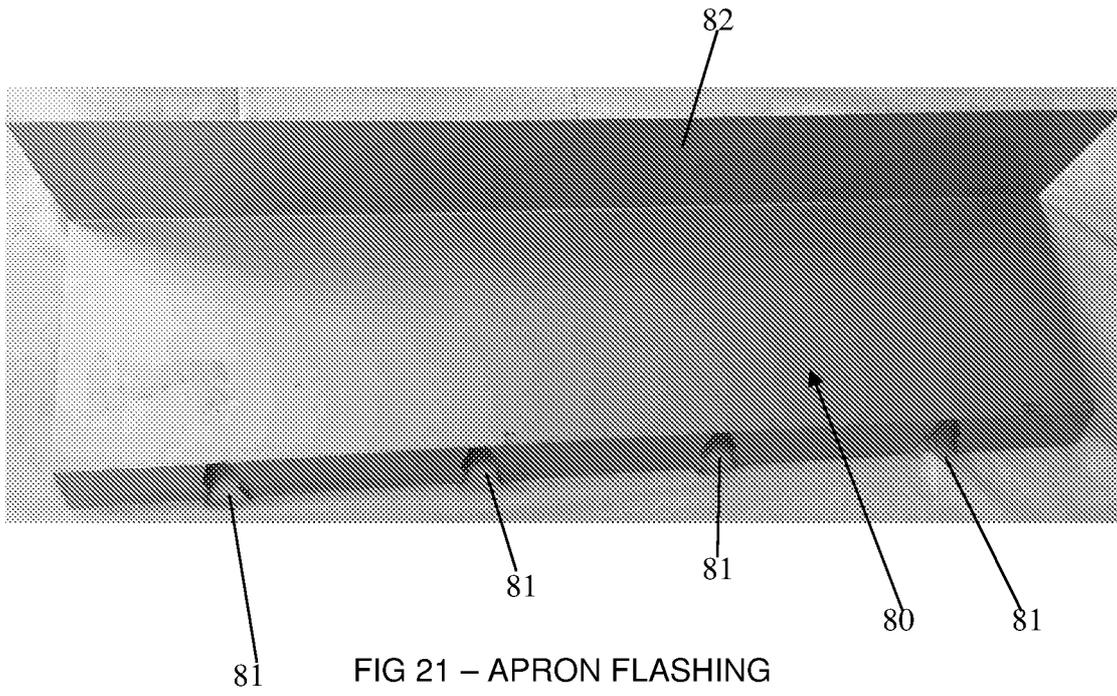


FIG 22 - APRON FLASHING FITTED TO ROOF.