(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 May 2012 (10.05.2012)

PCT

(10) International Publication Number
WO 2012/059757 A2

(51) International Patent Classification: Not classified

(21) International Application Number:
PCT/GB2011/052132

(22) International Filing Date:
2 November 2011 (02.11.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
1018473.7 2 November 2010 (02.11.2010) GB

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

WO 2012/059757 A2

(54) Title: IMPROVED CLADDING SYSTEM

(57) Abstract: A system for cladding containers where the cladding panels are attached to the containers using at least two adhesives, the first adhesive being a quick grab type of adhesive.

IMPROVED CLADDING SYSTEM

The present invention relates to an improved cladding system for structures and in particular metal containers.

Although the following description refers to metallic or steel shipping type containers, it will be appreciated by those skilled in the art that the apparatus and method of the current invention could be applied to other structures, such as outhouses, houses and sheds and/or the like or indeed any such container with relatively flat surfaces.

The use of steel and stainless steel containers to house very sensitive electrical control and operating equipment is known. These containers are usually situated in urban areas. Owners of the containers often face the problem that nearby residents and building regulators object to the appearance of the containers. One possible solution to this problem is to build around the containers to conceal the same with traditional materials such as brick, slate, stone etc. to match the surrounding area. There are several drawbacks to this solution. Firstly, the additional building materials are expensive. Secondly, the materials can place stresses and loads on the containers which can compromise the structural integrity of said container and thirdly, building around the container takes a considerable amount of time and is not easy to relocate if the container has to be moved.

Another possible solution is to clad the container. However, traditional cladding systems require the surface of the container to be pierced or breached. This is a large problem as the equipment inside the containers is sensitive and can be disrupted by the ingress of moisture and/or fluctuations in temperature.

Furthermore, it is becoming more commonplace to re-use or recycle containers. Examples include accommodation units such as homes and cricket pavilions. It is therefore important that such alternative uses blend in with the environment in which they are situated.

It is therefore an aim of the present invention to provide an improved cladding system where the surface of the container is not pierced or breached.

It is a further aim of the present invention to provide a cladding system which improves the appearance of containers.

It is a yet further aim of the present invention to provide a relatively low cost cladding system for containers which can be relatively quickly placed in position.

In a first aspect of the invention there is provided a system for cladding containers, said system including attaching one or more cladding panels to at least a portion of one or more surfaces in use, wherein said cladding panels are attached using a first adhesive means and at least a second adhesive means.

Typically the first adhesive means secures the cladding panels in position while the at least second adhesive means cures and/or sets, thereby bonding the cladding panels to the external container surface. Further typically once the second adhesive is cured and/or set it bonds more strongly than the first adhesive.

In a second aspect of the invention there is provided a system for cladding containers, said system including attaching a plurality of rails to at least a portion of one or more external surfaces of a container in use, wherein said rails are attached

using at least a first adhesive means and one or more cladding panels are located with said rails.

In one embodiment the system includes a first adhesive means and at least a second adhesive means. Typically the first adhesive means holds the rails in position on the surface of the container while the second adhesive means cures and/or sets.

Typically the first adhesive means secures the plurality of rails in position to create a framework to which one or more cladding panels can be located and engaged thereby cladding the container without compromising the integrity of the outer surface of the container. In one embodiment the cladding panels are engaged to the rails using mechanical location means.

In one embodiment the cladding panels are engaged to the rails using a combination of at least one adhesive means and mechanical location means.

Typically the mechanical location means are any one or any combination of screws, nuts and bolts, nails, rivets, clamps, studs and/or the like.

The framework has the advantage of creating a gap, cavity, and/or space between the outer surface of the container and the cladding. This arrangement aids air flow and rear-ventilation of the cladding, allowing the same to dry and preventing damp whilst also providing insulation for the container.

In one embodiment the rails are substantially linear in form.

In one embodiment the rails are substantially constructed from relatively lightweight materials. Typically the rails are constructed from materials such as aluminium, timber, plastics,

glass reinforced plastic (GRP), non-conductive carbon fibre and/or the like.

In one embodiment the rails are extrusions. Typically the rails are aluminium extrusions. Further typically the rails are substantially hollow.

In one embodiment the rails are attached to at least the outer surface walls and/or roofs of the containers. Typically the rails run substantially vertically along the walls of the containers.

In one embodiment the rails run substantially vertically and/or horizontally across the outer surfaces of the container thereby forming the framework to which the cladding panels are secured.

In one embodiment the first and/or second adhesive means are glues, resins, adhesive compositions, adhesive tapes, cements and/or the like.

In one embodiment the first adhesive means provides a temporary support to hold the rails to the surface of the container.

In one embodiment the second adhesive means is relatively stronger than the first adhesive means once the first and/or second adhesive means are cured and/or set and/or the like. Typically the first and second adhesive means are substantially located at, or applied between, the rail and the surface of the container to which it is to be attached in use.

In one embodiment the first adhesive means is a double sided adhesive tape and/or the like. Typically the first adhesive means is a 'quick-grab' type adhesive suitable for temporarily securing the rails and/or cladding panels until the second

adhesive means has cured and/or set. A 'quick-grab' type adhesive is one which does not take time to cure and/or set and can relatively quickly, or instantly, form adhesive contact.

In one embodiment the second adhesive means is panel adhesive and/or the like. Typically the panel type adhesive takes time to cure and/or set. Further typically the second adhesive means takes approximately between 20-60 minutes to cure and/or set into a relatively hard bonding resin. This time is typically required for the polymer initiator (often a catalyst) to polymerise the polymer monomers and/or oligomers. One example of a suitable panel adhesive is SikaTack, a polyurethane based adhesive which takes 40 minutes to become 'tack-free', with a Rate of Cure = 4mm / 24hrs approx.

The advantage of using a first adhesive means to fix the rails in place is that the panel framework can be quickly assembled. Furthermore, the cladding panels can be mounted on the frame means as the second adhesive means cures and/or sets.

In one embodiment the cladding panels are attached to the rails using securing means. Typically the securing means are conventional securing means such as screws, nuts and bolts, pins, nails and/or the like. The advantage of using the rails to secure the cladding panels is that conventional securing means which pierce the surface of the cladding panel and/or the rail can be used. As a result the cladding panels are relatively quickly and easily secured to the container via the rails.

In one embodiment the cladding panels are substantially planar articles. Typically the cladding panels are relatively lightweight sheets of plastics material, chipboard, plywood, fibreboard, hardboard and/or the like.

In one embodiment the cladding panels include an outer coating of sheet material or decorative cover and/or the like.

In one embodiment the cladding panels are formed to resemble the appearance of brickwork, tiles, slates, stonework and/or the like. Typically at least the outer surface of the panels are formed to resemble and/or are coated in a decorative cover to blend in with the environment in which they are situated.

In a third aspect of the invention there is provided a cladding system, said cladding system including a plurality of rails provided to support thereon cladding panels wherein at least a portion of the rails are attached to one or more outer surfaces to be clad via a first and second adhesive means.

In a fourth aspect of the invention there is provided a method of securing one or more cladding panels to a container, said method including the steps of;

- placing first and second adhesive means between one or more the rails;
- securing one or more cladding panels to said rails; wherein the fist adhesive means holds the rails in position while the second adhesive means cures and/or sets.

Typically the containers are steel or stainless steel containers in which computers and other such electrical equipment is housed for controlling systems, for example railways, communications and power distribution systems.

In one embodiment the containers comprise metal framework structures. Typically the metal framework structures are Metset and/or the like.

In one embodiment at least the containers walls are substantially comprise concrete. Typically the concrete is precast concrete and /or the like.

In a further aspect of the invention there is provided a method of securing one or more cladding panels to a surface, said method including the steps of:

- placing first and second adhesive means between one or more panels and/or one or more rails if present;
- securing the one or more cladding panels to the surface; or
- securing the one or more rails to the surface;

wherein the fist adhesive means holds the panels and/or rails in position while the second adhesive means cures and/or sets.

Specific embodiments of the invention are now described with reference to the following figures.

Figure 1 shows a front elevated and cut-away section of the cladding system in use;

Figure 2 shows a perspective view of a cut-away section of the cladding system in use; and

Figure 3 shows a plan view of one embodiment of the cladding system in use.

The following description relates to a system for securing cladding panels to unsightly containers, such as steel or metallic containers to improve their appearance without affecting the integrity of the outer shell of the container.

Turning firstly to figure 1, there is shown one end of a stainless steel container 2, similar in dimensions to a steel shipping container and/or the like. Containers such as this are often

used to house sophisticated computerised control systems. Therefore, it is important that the containers are watertight and the temperature inside can be regulated to some degree.

Attached to the outer surface 4 of the container is a rail 6. The rail in this example is an extruded rectangular tube of aluminium. The rail is secured to the container surface 4 by a first type of adhesive means 8 and a second type of adhesive means 10.

The first adhesive means 8 is a double sided adhesive tape in this embodiment, which can be pre-attached to the rail 6 or container surface 4 before use. The double sided tape is used to temporarily and quickly hold the rail 6 in position before the second adhesive means 10, in this example panel adhesive glue, cures and sets. Once the panel adhesive 10 cures the rail 6 is more securely fixed to the container surface than by the first adhesive means. The second adhesive means 10 is not strong enough to hold the rail and panel in position if used alone.

In most cases the cladding panels 12 can be secured to the rail after only a few minutes. This is because the partially cured second adhesive means 10 and the double sided tape 8 are strong enough to hold the panel in position until the second adhesive means fully cures. Typically it takes 40 minutes or more before such panel adhesives and/or the like are cured so it has no 'tack'. However, it can take over 24 hours for the adhesive to fully cure and/or set, depending on the quantity of adhesive applied.

The panels 12 are quickly secured or fastened to the rails using conventional fixings 14 such as nails, screws, fastening and/or the like. The panels 12 can be decorated with coverings to ensure that they bled in with the environment. Also, the panels

can be formed to resemble brickwork, stonework, roof tiles and/or the like so that they are sympathetic to the surroundings in which they are based. Additionally, the panels 12 can be quickly and easily changed if the container is to be relocated and/or the appearance of the container needs to be changed. Crucially the panels 12 can be mounted to the container 2 without piercing the outer surface of the container.

Examples of panels which can be provided are brick effect, aluminium, vinyl effect, stonechip effect, painted cladding, weatherboard, timber, imitation timber, slate effect, stone effect and natural riven stone effect.

In order to improve the appearance of the containers further, a roof of traditional appearance can be provided. Typically the roof is an apex style roof, and has a traditional pantile profile. The roof is lighter, easier and quicker to install than conventional roofing and thus reduces scaffolding usage. Apart from the improved appearance, the addition of a roof makes the steel structure weatherproof faster. Using a 'dry-fix' method of one or more adhesives means that no sand, concrete or mastic filler is required and the need for on-going maintenance is eliminated. Furthermore, growth of moss and algae is inhibited and the roof protects against weather penetration, and ingress by birds or vermin. Lightweight roofing tiles are manufactured from steel that is 'hot-dipped' in a specialised coating to give a significantly longer service life than a galvanised product. This process combines the superior corrosion protection of aluminium, with the advantages of zinc, to produce a corrosion resistant alloy roofing system.

Figure 2 shows a cut away section of the same fixing system. It can be seen that the rail 6 is formed from extruded lengths of aluminium and is hollow. This means that the rail 6 is relatively

lightweight and can be easily pierced by the fixings which secure the cladding panel 12 to the rail.

Typically, before the rail 6 is offered up to the surface 4 on which it is to be adhered, the first 8 and second 10 adhesives are applied to the same. The rail 6 is then pressed into position and the first adhesive means immediately secures, albeit relatively weakly, the rail 6 to the container surface 4. The second adhesive begins curing immediately and usually after a few minutes the rail is bonded to a sufficient degree to allow a panel to be fastened to the rail.

In an alternative method the rails 6 can be positioned to form a complete framework before the panels are secured to the same. In both methods the rails can be cut to length before or after attachment to the container. In this example the rails are aluminium, however other materials such as wood and plastics can be used. The frame of rails once formed often takes at least some of the weight which would have to be bourn by the container if the cladding is positioned on or around the same.

Figure 3 shows a plan view of the fixing system. It can be seen that two parallel strips of the first adhesive means 8 are positioned substantially towards the edge longitudinal edges of the rails 6. The second adhesive means 10 is also positioned as two parallel strips that run inside the strips of first adhesive means 8 and further away from the edge of the rails 6.

The fixing means in this example are screws 14 which extend through the cladding panels 12, 12' and into the rails 6 but not into the surface of the container 4. In this example each rail 6, 6' holds a different cladding panel 12, 12'. However, it will be appreciated by those skilled in the art that a single rail could be

attached to two or more panels and/or a single panel could be supported by two or more rails.

Claims:

1. A cladding system including attaching one or more cladding panels to at least a portion of one or more surfaces in use, wherein said cladding panels are attached to the one or more surfaces using a first adhesive means and at least a second adhesive means.

2. A cladding system according to claim 1 wherein the first adhesive means secures the panel in position while at least the second adhesive means sets and/or cures.

3. A cladding system according to claims 1 or 2 wherein when at least the second adhesive means is cured and/or set it bonds more strongly than the first adhesive means.

4. A cladding system according to any preceding claim wherein the system includes one or more rails.

5. A cladding system according to claim 4 wherein the rails are positioned between the one or more surfaces and the cladding panels.

6. A cladding system according to claim 5 wherein the cladding panels are positioned with said rails.

7. A cladding system according to any of claims 4-6 wherein the rails are attached to the one or more surfaces by at least the first adhesive means.

8. A cladding system according to claim 7 wherein the rails are attached using first and at least a second adhesive means.

9. A cladding system according to any of claims 4-8 wherein the cladding panels are attached to the rails using mechanical location means.

10. A cladding system according to any of claims 4-9 wherein the rails are substantially linear in form and hollow.

11. A cladding system according to any of claims 4-10 wherein the rails run substantially horizontally and/or vertically along the walls of the container in use thereby providing a framework to which the panels are attached.

12. A cladding system according to any preceding claim wherein the cladding panel is substantially planar.

13. A cladding system according to any preceding claim wherein at least the outer surface of the cladding panels are decorated to resemble and/or blend in with the environment in which the container is situated.

14. A method of securing one or more cladding panels to a surface, said method including the steps of:

- placing first and second adhesive means between one or more panels and/or one or more rails if present;
- securing the one or more cladding panels to the surface; or
- securing the one or more rails to the surface;

wherein the fist adhesive means holds the panels and/or rails in position while the second adhesive means cures and/or sets.

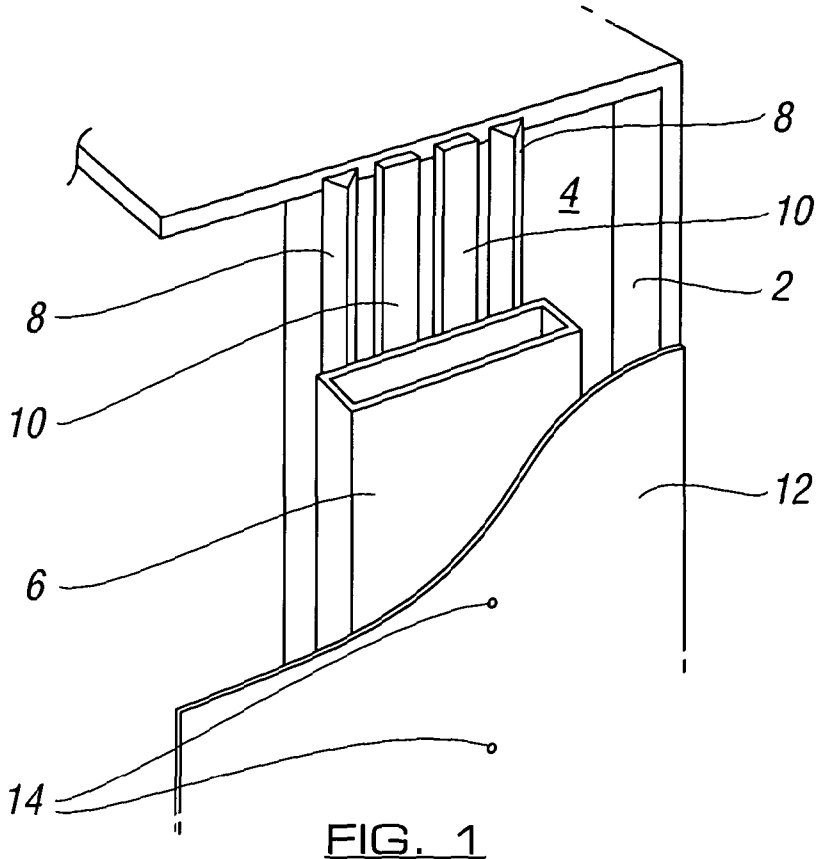

FIG. 1

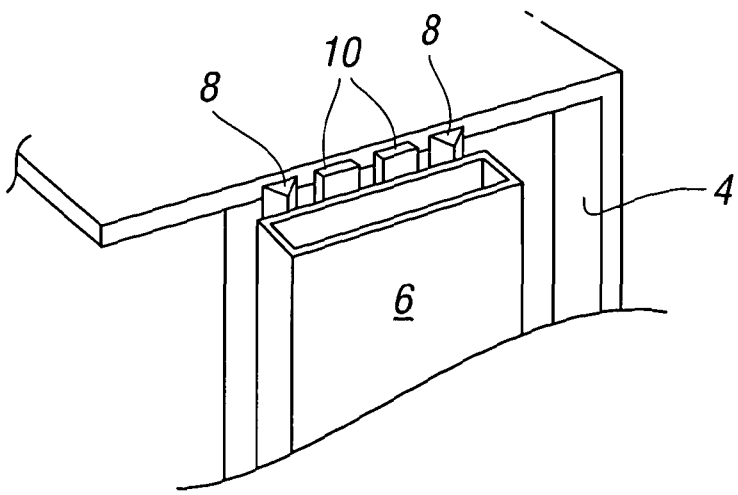

FIG. 2

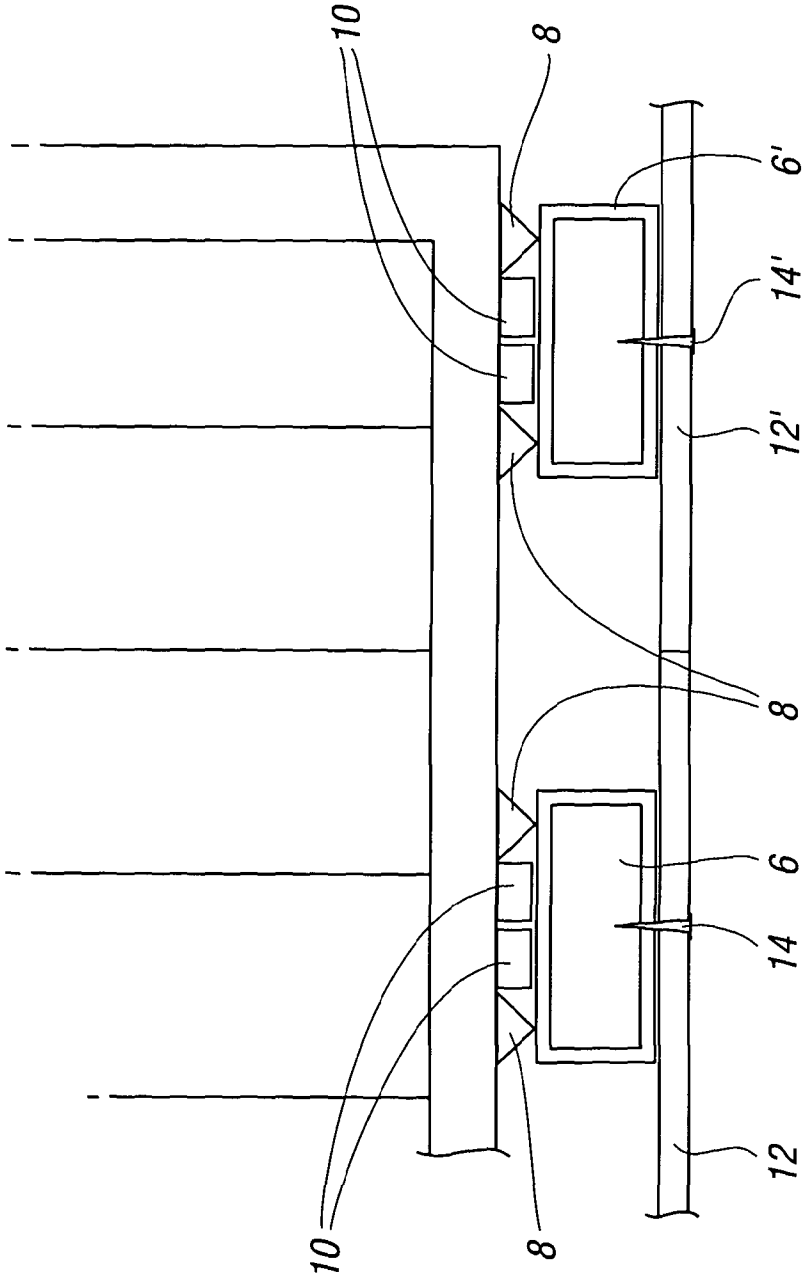

FIG. 3