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54 **A jointing system.**

57 A jointing system for joining clad insulation panels of the type which may be used to construct cold stores or to isolate heated areas. The edge of one facing panel (1,2) defines a substantially U-shaped channel (5) and a spline (6) carried by the edge of an adjacent facing panel (1,2) is adapted to be received into the U-shaped channel (5) to join the two facing panels (1,2) together. The adjacent facing panel (1,2) may also define a substantially U-shaped channel (5) in which the spine (6) is received, or the spline may form an integral part of the adjacent facing panel. Any gaps between the spline (6) and the sides of the or each U-shaped channel (5) are filled with a sealant material (7).

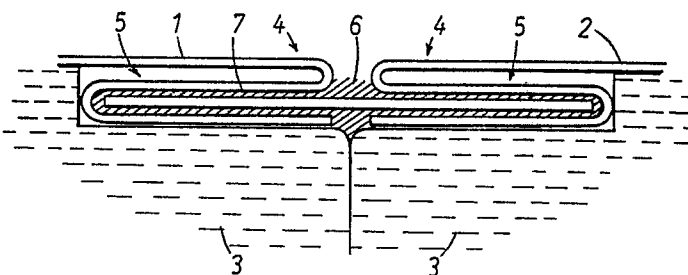


Fig 1

Description

"A JOINTING SYSTEM"

The present invention relates to a jointing system for joining together clad insulation panels of the type which are used to construct cold stores, insulated buildings and the like.

Insulation panels of the type which are used to construct cold stores, insulated buildings and the like generally comprise a layer of insulating material, such as plastic foam, mineral wool, glass fibre, etc., clad with facing sheets on both sides to protect and contain the insulating material. A common form of these insulation panels generally comprises a sheet of polyurethane or polystyrene foam clad in steel or aluminium sheet. The insulating efficiency of these panels is very high, but there is a problem in maintaining this same degree of insulating efficiency at the edges of the panels where they are joined together. Here, great care must be taken not to provide a thermally conductive path between the inner and outer sides of the panel as this encourages condensation on the warmer, outer side of the panel which in turn leads to rusting and/or warping of the facing sheets, forced separation of the joints between adjacent panels and separation of the facing sheets from the insulating material. Clearly, most metals, which have excellent thermal transmission properties, must be excluded from the region between the edges of adjacent insulation panels at all costs.

In order to prevent thermally conductive paths arising between the edges of adjacent insulation panels various jointing systems have been employed, but most rely heavily on providing and maintaining an accurate match between the edges of the insulation panels over their entire length so that the edges of the insulating material are in close contact with each other when the edges of the insulation panels are brought together. This is particularly difficult to achieve with large panels having long edges and it is therefore common practise to employ securing brackets or clips which bridge the joints between adjacent insulation panels and are screwed or bolted in place on each side of the joint to clamp the edges of the insulating material together. In addition, complex tongue and groove arrangements may be provided between adjacent edges of the insulation panels, together with sealing gaskets to prevent passage of vapour and liquid through the joint.

The use of securing brackets or clips, tongue and groove arrangements and sealing gaskets all add to the complexity of the joint between adjacent insulation panels and hence the cost. Furthermore, using such securing brackets or clips it is still necessary to ensure that the edges of the facing sheets match each other over their length, or gaps will arise over the length of the joint into which water can seep and cause separation of the facing sheets from the insulating material. The difficulty of accurately matching the edges of the facing panels becomes even greater where the facing sheets themselves are prone to thermal contraction and

expansion as the conventional jointing systems do not provide any simple means of effectively accommodating this. As the facing sheets expand they push against each other forcing the joint apart, and as the facing sheets contract gaps arise into which water can seep with the results indicated previously.

It is an object of the present invention to provide a jointing system whereby reliable joints can be provided between the edges of adjacent clad insulation panels without relying upon high accuracy and precision in the manufacture of the clad insulation panels for their success.

It is further object of the present invention to provide a jointing system for joining clad insulation panels which has a very low thermal conductivity.

It is yet another object of the present invention to provide a jointing system for joining clad insulation panels which prevents or at least substantially prevents the passage of vapour or liquid through the joint.

According to the present invention there is provided a jointing system for joining clad insulation panels, wherein the edge of one facing panel defines a substantially U-shaped channel therein and a spline carried by the edge of an adjacent facing panel is slotted into the U-shaped channel to close the gap between the two adjacent facing panels.

Preferably, any gaps between the U-shaped channels and the spline are filled with a mastic sealant to keep the joint closed and prevent passage of vapour or liquid therethrough. The mastic is chosen to be reasonably flexible when set so that relative movement of the adjacent edges of the facing panels as a result of expansion and contraction can be accommodated.

Preferably, the edges of both adjacent facing panels define substantially U-shaped channels and the spline is slotted into both U-shaped channels. Conveniently, the spline is first slotted into the U-shaped channel of a first facing panel over its entire length and then the edges of the two clad insulation panels are brought together so that the spline is slotted into the U-shaped channel of the second facing panel over its entire length.

The relative dimensions of the U-shaped channels and of the spline are such as to ensure that whilst the spline is not so wide as to prevent the U-shaped channels coming together it will provide sufficient overlap with the U-shaped channels, if not tightly closed together, to close the joint and allow the mastic to make a proper seal.

Preferably, the insulating material of each clad insulation panel extends slightly beyond the U-shaped channels defined by the facing panels so as to ensure that the adjacent edges of the insulating material are in close contact with each other without interference from the facing sheets.

Preferably, the spline is comprised of a metal strip. Conveniently, the edge of each clad insulation panel defines a labyrinth profile to further enhance the insulating efficiency of the joint.

In a preferred embodiment of the present invention the U-shaped channels are formed as an integral part of the facing panels. However, as an alternative to this the U-shaped channels may be formed as separate components which are clipped to the edges of the facing panels. Conveniently, this can be achieved by folding the edge of the facing panel back on itself and sliding one leg of the U-shaped channel component under the returned edge of the facing panel to retain it in place.

The jointing system of the present invention is particularly suited to accommodating variations in thickness of the clad insulation panels, misalignment and also bowing. Furthermore, the jointing system allows relative movement of the facing panels to be accommodated without imposing any strains on the join or introducing gaps. These characteristic advantages are all possible because the spline is not a tight fit in the U-shaped channels to seal the joint, but rather a loose fit so as to merely close the joint. It is the flexible mastic introduced between the channels and the spline which seals the joint up.

The jointing system of the present invention also allows liquid foam materials to be introduced into the joint which expand to fill all cracks and spaces before hardening to make a continuous insulation layer about the joint.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 shows a partial profile of two clad insulation panels embodying a first jointing system in accordance with the present invention; and,

Fig. 2 shows a partial profile of two clad insulation panels embodying a second jointing system in accordance with the present invention.

The construction of the channels at the edges of the facing sheets can be achieved in a variety of ways, as will be readily appreciated. In the embodiment of Fig. 1, the edges of the facing sheets 1 and 2 have been passed through a roller, prior to being laminated to the insulating material 3, so as to form an S-shaped configuration 4 at the edge of each facing sheet 1 and 2. The end portion of each S-shaped configuration can be seen to define a U-shaped channel 5 as required. In order to accommodate the S-shaped configuration 4 a portion of the insulating material 3 is cut away at the corner.

When the clad insulation panels are brought together a spline 6 is introduced into the U-shaped channels 5 along the entire length of the edge to close the joint and the gaps between the U-shaped channels 5 and the spline 6 are then filled with mastic 7 which seals the joint.

An alternative construction for the U-shaped channels is shown with reference to Fig. 2. Here, the U-shaped channels 8 are not integral with the facing panels 9, but rather, each is held in place by a folded back portion 10 of the edge of the facing panel 9. In this respect, one leg of the U-shaped channel 8 is slid under the folded back portion 10. It will be appreciated that the U-shaped channel section does

not need to be provided as a continuous length because the facing panel 9 covers any gaps therebetween. It is sufficient to fit manageable lengths of channel in contiguous fashion under the folded back portion 10.

As in the embodiment of Fig. 1 a spline 6 is introduced into the U-shaped channels 8 to close the joint and the gaps between the U-shaped channels 8 and the spline 6 are then filled with mastic 7 which seals the joint.

It will be readily appreciated that clad insulation panels can have excellent fire resistant qualities if appropriate materials are selected for their manufacture. For example, phenolic foam insulating material clad with steel or aluminium can be demonstrated to have a one hour fire resistance to BS 476 Part 8. However, conventional joints between the panels may constitute a weak spot through which fire and heat can pass. Using the jointing system of the present invention there is little, if any, likelihood of such a weak spot arising as the spline between the panels ensures that the panels are effectively continuous. In other words, there is no possibility of heat and flames passing through a joint to the insulating material, thereby comprising the overall of fire resistance of the panels. This is obviously most important as a fire close to a cold store could cause a great deal of damage if it were able to pass through the panel joints unrestrained.

The manufacture of clad insulation panels in accordance with the present invention may be conveniently classified into two groups. In the first of these the insulating material is provided as a block and the facing panels are fixed to it by adhesion. In the second the insulating material is injected as a liquid between the facing panels where it foams and hardens to form the insulation in situ. Various modifications of these techniques are used and the advantages to be derived from them are vigorously upheld by the manufacturers concerned. The jointing system of the present invention is applicable to all of these methods of clad insulation panel construction and improves their efficacy without detracting from their inherent virtues.

Claims

1. A jointing system for joining clad insulation panels, characterised in that the edge of one facing panel (1,2) defines a substantially U-shaped channel (5) therein and a spline (6) carried by the edge of an adjacent facing panel (1,2) is adapted to be received into the U-shaped channel (5) to join the two facing panels (1,2).

2. A jointing system according to claim 1, characterised in that the edge of the said adjacent facing panel (1,2) defines a substantially U-shaped channel (5) therein and the spline (6) is adapted to be received therein.

3. A jointing system according to claim 1 or 2, characterised in that any gaps between the

spline (6) and the sides of the or each U-shaped channel (5) are filled with a sealant material (7).

4. A jointing system according to claim 3, characterised in that the sealant material (7) comprises a mastic sealant.

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5. A jointing system according to claim 3 or 4 characterised in that the sealant material comprises an intumescent foam.

6. A jointing system according to any preceding claim characterised in that the relative dimensions of the spline (6) and of the or each U-shaped channel (5) are such as to ensure that whilst the spline (6) is not so wide as to prevent the edges of the clad insulation panels being brought into facing abutment with each other, it is received far enough into the or each U-shaped channel (5) to form a continuous join along the full length of the adjacent facing panel edges.

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7. A jointing system according to any preceding claim, characterised in that the insulating material (3) of each clad insulation panel stands proud of the U-shaped channel defined by the edge of the facing panel.

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8. A jointing system according to any preceding claim, characterised in that the spline (6) is comprised of a metal strip.

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9. A jointing system according to any preceding claim, characterised in that the edge of each clad insulation panel defines a labyrinth profile to further enhance the insulating efficiency of the joint.

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10. A jointing system according to any preceding claim, characterised in that the U-shaped channel (5) forms as an integral part of the facing panel (1,2).

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11. A jointing system according to any of claims 1 to 9 characterised in that the U-shaped channel is secured to the edge of the facing panels.

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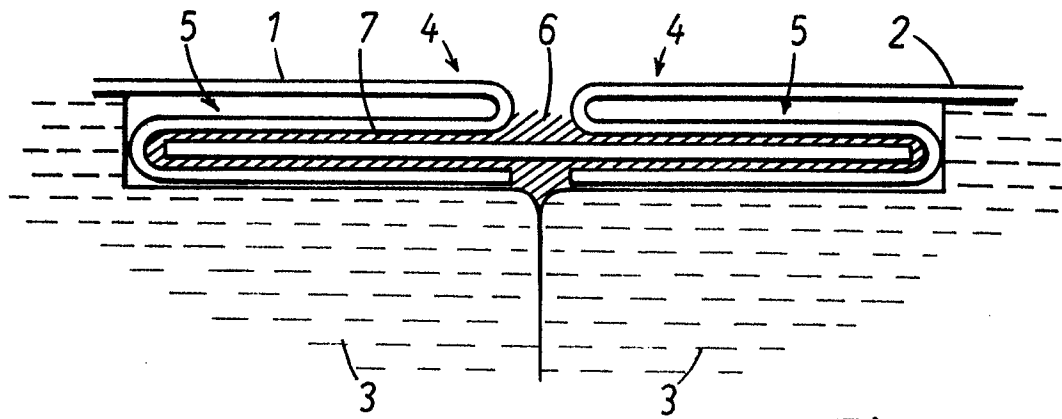


Fig 1.

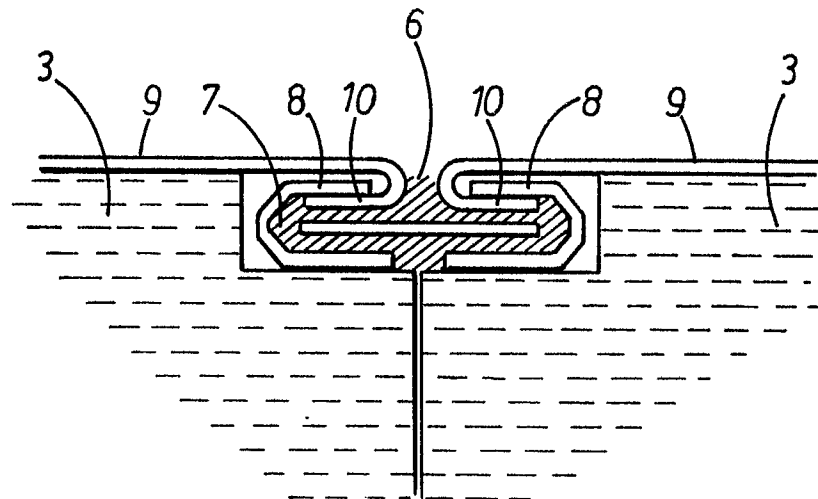


Fig 2.



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 30 3142

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	FR-A-2 526 069 (VIESSMANN KG) * Page 3, lines 28-38; page 4, lines 1-36; page 5, lines 1-36; page 6, lines 1-23; figures 1,3 *	1,2,3,4 ,6,8,	E 04 H 5/10 E 04 B 1/80
A	---	7	
A	DE-A-2 805 694 (BRÜCKNER-TROCKENTECHNIK) * Page 9, lines 16-32; page 10, lines 1-33; page 11, lines 1-25; page 12, lines 12-24; figure 2 *	1,2,8	
A	EP-A-0 110 265 (METECNO S.p.A.) * Page 8, lines 8-27; page 9, lines 1-14; page 11, lines 13-26; page 12, lines 1,2; figures 14-17 *	1,9	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			E 04 H E 04 B E 04 F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24-07-1988	Examiner SCHOLS W.L.H.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	