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(54) **METHOD FOR ACHIEVING A FIXING OF AN IN- OR OUTLET SOCKET.**

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(73) Proprietor: **TORELL AB**
Box 1174
S-581 11 Linköping (SE)

(72) Inventor: **HEDMAN, Erik**
Lövsbergsvägen 36
S-582 69 Linköping (SE)

(74) Representative: **Willquist, Bo Lorentz**
PATS. Willquist Patents S:t Larsgatan 29
S-582 24 Linköping (SE)

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Description

The present invention relates to a method for executing the attachment of an inlet or outlet sleeve coupling to a supporting plate of a plate heat exchanger.

A plate heat exchanger of this kind is described in more detail in CH—A—633 099 and in Swedish Patent Application No. 8501599-8, from which this Application is derived.

A plate heat exchanger comprises a number of preferably rectangular plates, of which the outer plates constitute the aforementioned supporting plates. The number of plates is selected having regard for the capacity of the heat exchanger and is joined together during manufacture, for instance by vacuum soldering. One of the supporting plates is provided with cut-outs for inlet and outlet sleeve couplings.

A problem associated with the previously disclosed design is the complex procedure for executing the attachment of the sleeve couplings to the supporting plate. In said Swiss patent publication the sleeve coupling is attached to the supporting plate by soldering which is carried out simultaneously with the soldering of the heat exchanger plates. A solder plate is placed between the supporting plate and the sleeve coupling which is held in position by means of a suitable tool. However, this way of holding the sleeve coupling in position requires skilled handling and a relatively complicated tool otherwise the sleeve coupling may slide during the soldering, which may result in an unsatisfactory connection between the sleeve coupling and the supporting plate.

This problem is solved by the manufacturing method described in claim 1.

The invention is described below in further detail with reference to the accompanying drawing, in which Fig. 1 provides a diagrammatic representation of a plate heat exchanger viewed from above without a supporting plate and sleeve couplings. Fig. 2 illustrates in the form of a cross-section along the line A—A in Fig. 1 a plate heat exchanger with sleeve couplings in accordance with the invention. Fig. 3 illustrates a cross-section along the line B—B in Fig. 1 of the heat exchanger. Fig. 4 illustrates in the form of a detailed view taken from Fig. 3 an attachment of a sleeve coupling in the manner proposed in the invention.

The reference 1 is used in the drawing to designate a plate heat exchanger which comprises a number of plates 2a, 2b, 2c and 2d and inlet and outlet sleeve connections 3, 4, 5, 6. The plates 2a, 2b, 2c and 2d are essentially rectangular and have a relief pattern 7 and a border 8 running around its perimeter. This is off-set in two ledges 9, 10 by approximately one thickness of the plate so that the plates 2a, 2b, 2c and 2d are capable of being inserted into one another. This means that the border 8 can be divided up into three steps 8a, 8b, 8c. The first step, the so-called pattern step, is so arranged as to enclose the relief pattern 7 of

the plate. The second step, which is referred to as the screening step, is intended to integrate the flow area for the flow channel of the subsequent plate. The third step 8c is intended to constitute a joining and sealing element with the second step of the adjacent plate and is accordingly described as the joint step.

The first ledge shall be situated at a distance from the bend in the border 8 which is approximately equal to the depth of the pattern 7 in the plate 2. The second ledge 10 shall be situated at a distance from the bend in the border 8 which is approximately equal to twice the depth of the pattern.

By specifying the position of the two ledges 9, 10 in relation to the depth of the pattern, it is possible to join together plates 2 with different depths of pattern, in so doing enabling the heat exchanger to be given particular characteristics.

In the drawing in accordance with Fig. 3 the inlet and outlet sleeve couplings are designated respectively by 3 and 6 and are attached to the supporting plate 11a by the aforementioned sleeve couplings 3, 6, on the side which it is intended to attach to the supporting plate, being provided with a section 14 of thinner wall thickness than the rest of the sleeve coupling. This section is illustrated in Fig. 4 by a solid line and is shown to be introduced into a cut-out intended for this purpose in the supporting plate. The outer end of the section with thinner wall thickness is then formed around the edge of the cut-out executed in the supporting plate so as to produce a flange 14a. A first fixing between the supporting plate and the sleeve coupling is achieved in this way.

The final fixing is achieved when the assembled heat exchanger 1 is soldered, with this procedure preferably being performed in a vacuum. In order to facilitate the soldering operation, and in order reliably to achieve tight soldered joints, the plates of the heat exchanger, including the supporting plates, are manufactured from a material which consists of, for example, stainless steel sheet with a thin layer of copper applied to it by rolling. The copper layer forms a solder on soldering and also produces a good soldered joint between the supporting plates and the sleeve couplings.

Claim

Method for executing the attachment of an inlet or outlet sleeve coupling (3, 4, 5, 6) to a supporting plate (11a) of a plate heat exchanger (1), wherein the one end of the aforementioned sleeve coupling (3, 4, 5, 6), is first provided with a section (14) of thinner wall thickness than the rest of the sleeve coupling, in that this thinner section is introduced into a cut-out intended for the sleeve coupling arranged in the supporting plate (11a) and in at least one of the heat exchanger plates (2a, 2b), in that the end of the thinner section (14) projecting beyond the supporting plate (11a) and at least one of said heat exchanger plates (2a, 2b), is formed around the edge of the

cut-out so as to produce a flange (14) and so that the top and bottom surfaces of the edge of the cut-out are in contact with the bottom extremity of the thicker wall section of the sleeve coupling and the flange (14, 14a) respectively, thereby achieving a first fixing of the sleeve coupling (3, 4, 5, 6), whereupon the sleeve coupling is soldered in conjunction with the soldering of the assembled heat exchanger (1).

Patentanspruch

Verfahren zum Ausführen der Befestigung eines Einlaß- oder Auslaßanschlußstutzens (3, 4, 5, 6) an einer Tragplatte (11a) eines Plattenwärmetauschers (1), bei dem das eine Ende des vorerwähnten Anschlußstutzens (3, 4, 5, 6) zunächst mit einem Abschnitt (14) geringerer Wanddicke als im Rest des Anschlußstutzens versehen wird, dieser dünnere Abschnitt in einen Ausschnitt eingesetzt wird, der für den Anschlußstutzen in der Tragplatte (11a) und in wenigstens einer der Wärmetauscherplatten (2a, 2b) vorgesehen ist, das Ende des dünneren Abschnitts (14), der über die Tragplatte (11a) und wenigstens eine der genannten Wärmetauscherplatten (2a, 2b) vorsteht, um den Rand des Ausschnitts verformt wird, um einen Flansch (14) auszubilden, sodaß die Ober- und Unterseiten des Randes des Ausschnitts in Berührung mit dem unteren Ende des dickeren Wandabschnitts des Anschlußstutzens bzw. mit dem Flansch (14, 14a) sind, um dadurch

eine erste Befestigung des Anschlußstutzens (3, 4, 5, 6) zu erhalten, woraufhin der Anschlußstutzen zusammen mit dem Verlöten des zusammengesetzten Wärmetauschers (1) verlötet wird.

Revendication

Méthode pour réaliser la fixation d'un manchon de couplage d'entrée et de sortie (3, 4, 5, 6) sur une plaque support (11a) d'un échangeur thermique à plaques (1), dans lequel la seule extrémité du manchon de couplage susmentionné (3, 4, 5, 6) est d'abord pourvue d'une partie (14) l'épaisseur de paroi est plus mince que le reste du manchon, en ce que cette partie plus mince est insérée dans un évidement, destiné au manchon, disposé dans la plaque support (11a) et dans au moins une des plaques de l'échangeur thermique (2a, 2b), en ce que l'extrémité de la partie plus mince (14) en saillie au delà de la plaque support (11a) et d'au moins une desdites plaques de l'échangeur thermique (2a, 2b), est conformée en collerette (14) autour du bord de l'évidement et de telle sorte que les surfaces supérieure et inférieure du bord de l'évidement soient en contact avec le fond de l'extrémité de la partie de plus forte épaisseur du manchon et avec la collerette, respectivement, ce par quoi est réalisée une première fixation du manche, après quoi le manchon est soudé en même temps qu'est effectué le soudage de l'échangeur thermique monté.

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FIG1

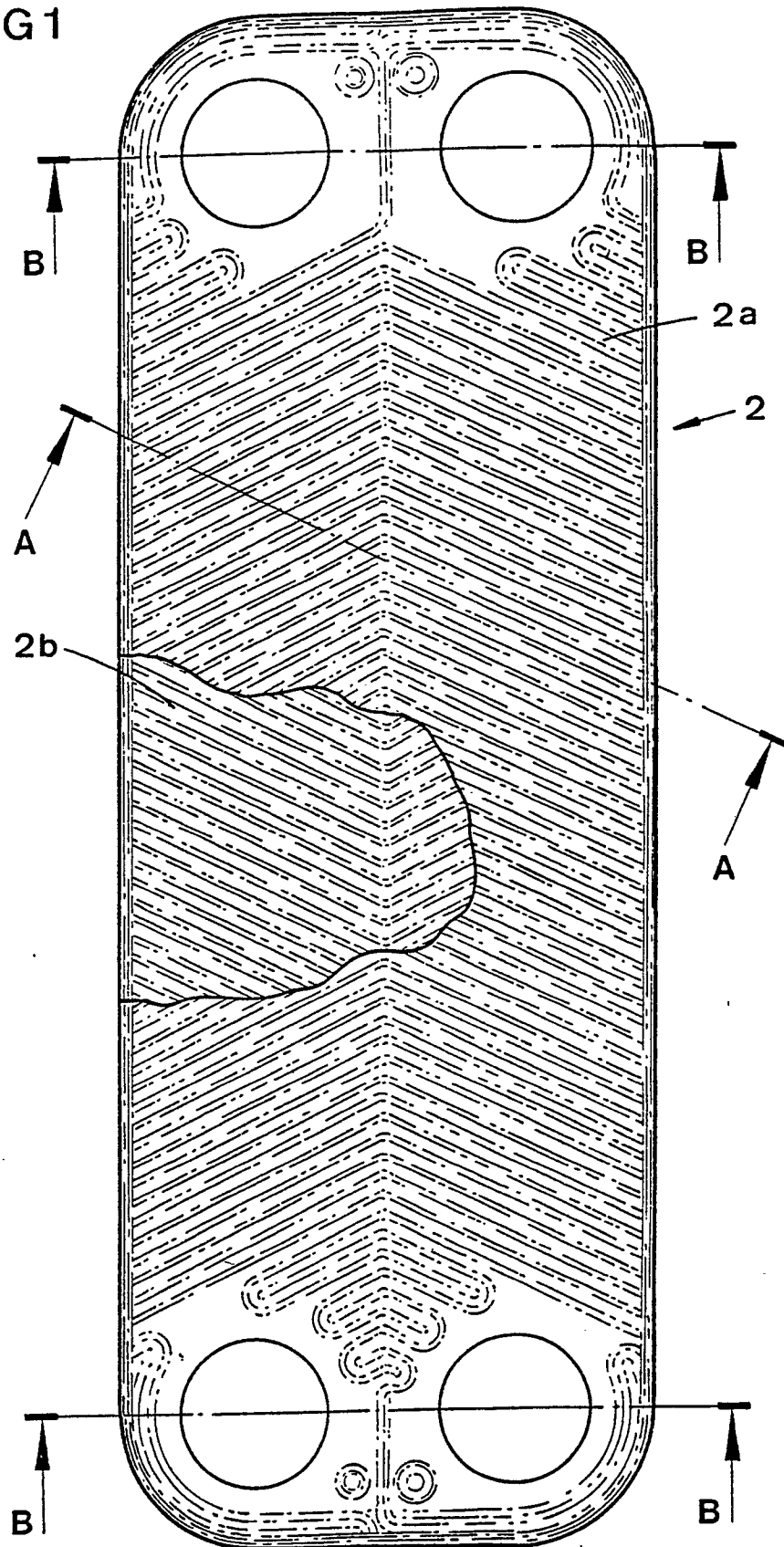


FIG 2

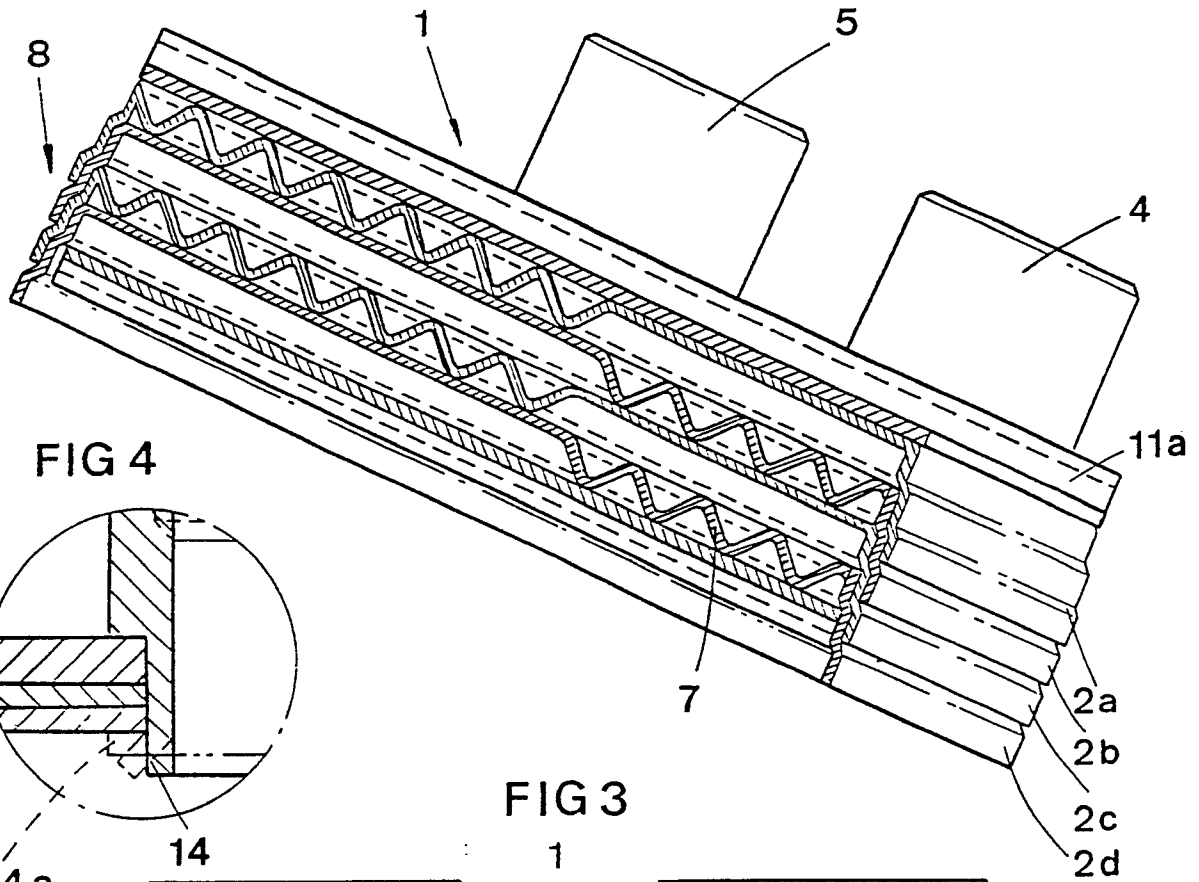


FIG 4

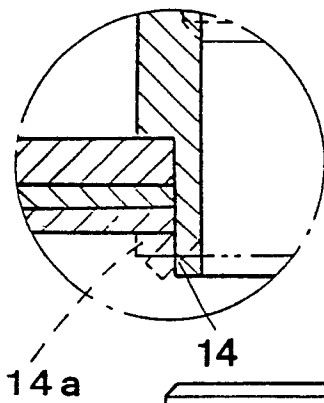


FIG 3

