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(54) **A PLATE HEAT EXCHANGER.**

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Derwent's abstract SU 1035399 15.08.83

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Description

The present invention relates to a plate heat exchanger comprising a number of essentially rectangular plates, of which the outermost plates are supporting plates a first of which is provided with cut-outs for the attachment of inlet and outlet sleeve connections.

A plate heat exchanger of this kind is described in more detail in Swedish Patent Application No. 8501599-8, from which this Application is derived, family member WO 86/05866.

A disadvantage of the previously disclosed design is the fact that the outermost plates, the so-called supporting plates in which inlet and outlet sleeve connections are arranged at least on one side of the heat exchanger, can be subjected to stresses resulting from the residual thermal stresses associated with the manufacturing process in conjunction with the operating stresses (pressure fluctuations, vibrations and thermal stresses), which can achieve a value such that fractures may occur not only in the joint between the sleeve connection and the supporting plate, but also between the latter and adjacent heat exchanger plates, resulting in leakage.

From Derwent's abstract SU 1 035 399 is known a plate heat exchanger, its supporting plates provided with a convex shape in order to increase rigidity. However, such supporting plates, because of their convex shape, can not be soldered to the adjacent heat exchanger plates, which leads to a less rigid construction compared with a heat exchanger, the supporting plates of which are soldered to the adjacent plates.

In order to avoid fractures of the above kind in the joint between the inlet and outlet sleeve connections and the supporting plate on the one hand, and between the latter and an adjacent heat exchanger plate on the other hand, the aforementioned supporting plates are provided in accordance with the invention with a number of folds running across the plate, with the folds in said first plate being arranged between the cut-outs.

The construction of a plate heat exchanger is intended to be explained below in more detail with reference to the accompanying drawing, in which Fig. 1a illustrates schematically a plate heat exchanger viewed from above with a supporting plate and sleeve couplings, and Fig. 1b illustrates a plate heat exchanger with a supporting plate viewed from below. Fig. 2 shows a cross-section through a plate heat exchanger. Fig. 3 shows a cross-section of the aforementioned heat exchanger.

The reference 1 is used in the drawing to designate a plate heat exchanger which comprises a number of plates 2a, 2b, 2c, 2d and inlet and outlet sleeve couplings 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 in three steps 8a, 8b, 8c. The firt 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 9 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.

In a plate heat exchanger of this kind the outermost plates are so-called supporting plates 11a, 11b (see Figs. 2, 3). One of these 11a is provided with cut-outs 12a, 12b for the attachment of the inlet and outlet sleeve couplings 4, 5.

According to the invention the supporting plates 11, 11b are executed with a number of folds 13 running across each plate. In the case of the supporting plate 11a with cut-outs for the sleeve couplings, the folds 13 are arranged between the cut-outs. The folds are intended to absorb the dimensional variations in the plate heat exchanger 1 which can occur in the case of major variations in temperature, both in conjunction with soldering and when the heat exchanger is in use. The folded supporting plates in this case operate in a similar fashion to a concertina bellows.

Claim

Plate heat exchanter (1) comprising a number of essentially rectangular plates (2a, 2b, 2c, 2d), of which the outermost plates (11) are supporting plates, a first (11a) of which is provided with cut-outs (12) for the attachment of inlet and outlet sleeve connections (3, 4, 5, 6), characterized in that the aforementioned supporting plates (11) are provided with a number of folds (13) running across the plate, with the folds in said first plate (11a) being arranged between the cut-outs.

Patentanspruch

Plattenwärmetauscher (1) mit mehreren, im wesentlichen rechteckigen Platten (2a, 2b, 2c, 2d), von denen die äußersten Platten (11) Tragplatten sind, von denen eine erste (11a) mit Ausschnitten (12) für die Befestigung von Einlaß- und Auslaßanschlußstutzen (3, 4, 5, 6) versehen ist, dadurch gekennzeichnet, daß die vorerwähnten Tragplatten (11) mit mehreren Falten (13) versehen sind, die über die Platte laufen, wobei die Falten in der genannten ersten Platte (11a) zwischen den Ausschnitten angeordnet sind.

Revendication

Echangeur thermique à plaques (1) comprenant un certain nombre de plaques de forme rectangulaire (2a, 2b, 2c, 2d), dont les plaques les plus à l'extérieur (11) sont des plaques support, dont une première (11a) est pourvue d'évidements (12) servant à la fixation des manchons de liaison d'entrée et de sortie (3, 4, 5, 6), caractérisé: en ce que les plaques support (11) sus-mentionnées sont pourvues d'un certain nombre de plis (13) s'étendant suivant le travers de la plaque, les plis de ladite plaque (11a) étant disposés entre les évidements.

FIG 1a

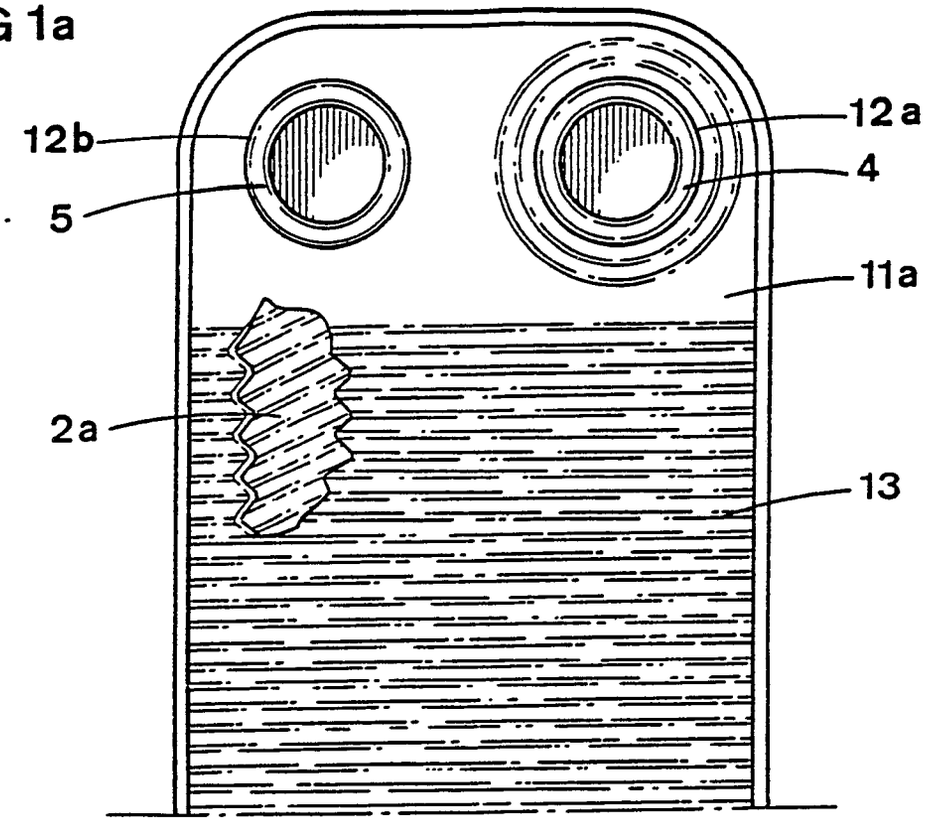


FIG 1b

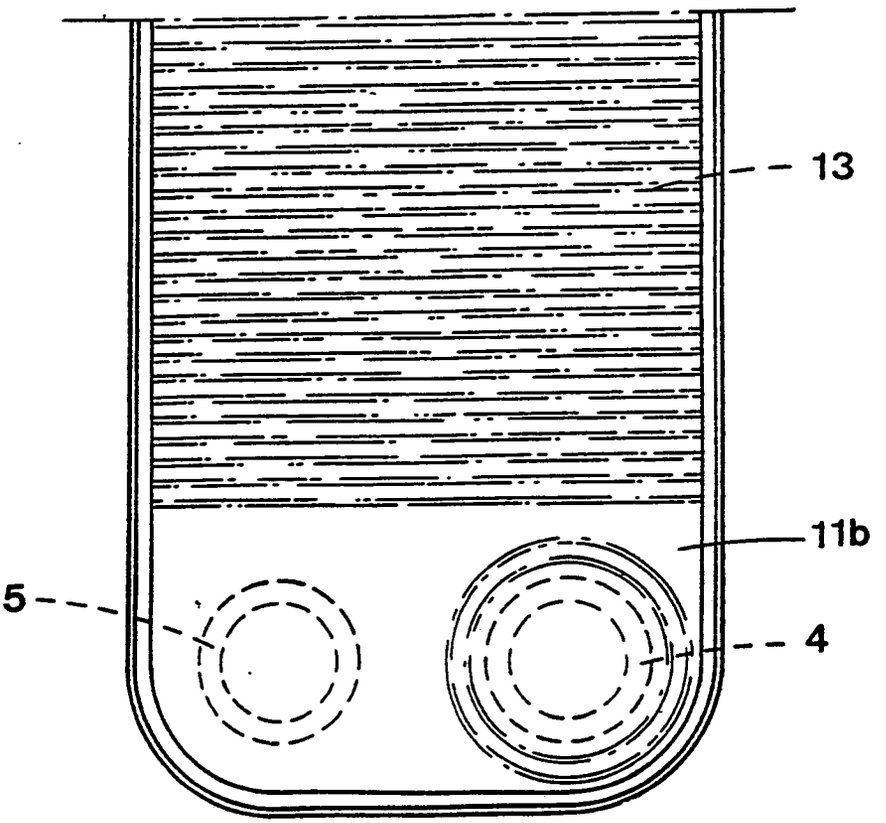


FIG 2

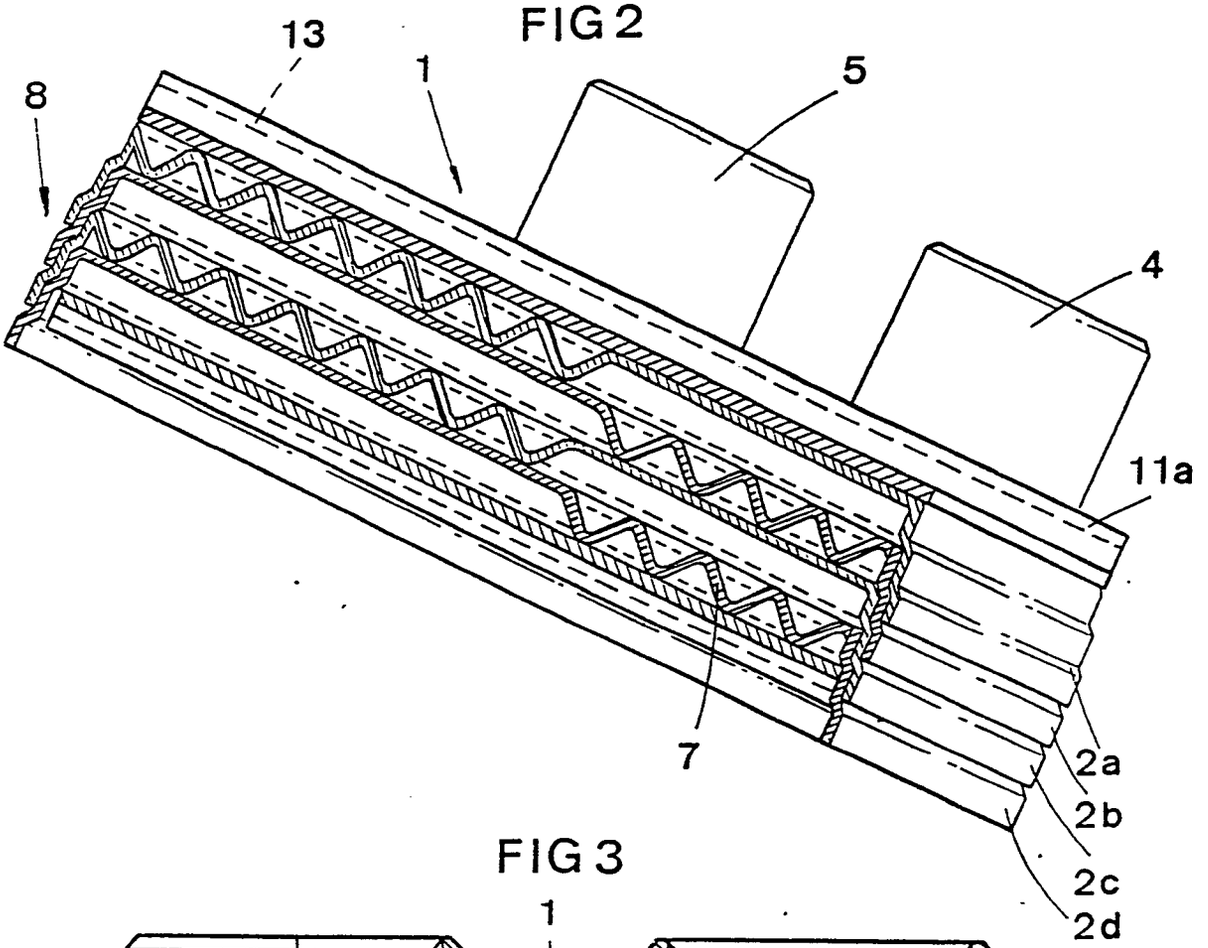


FIG 3

