April 6, 1965 K. GREENWOOD ETAL 3,176,762

SUPPORTING GRIDS FOR HEAT EXCHANGER ELEMENTS

Filed July 5, 1963 2 Sheets-Sheet 1

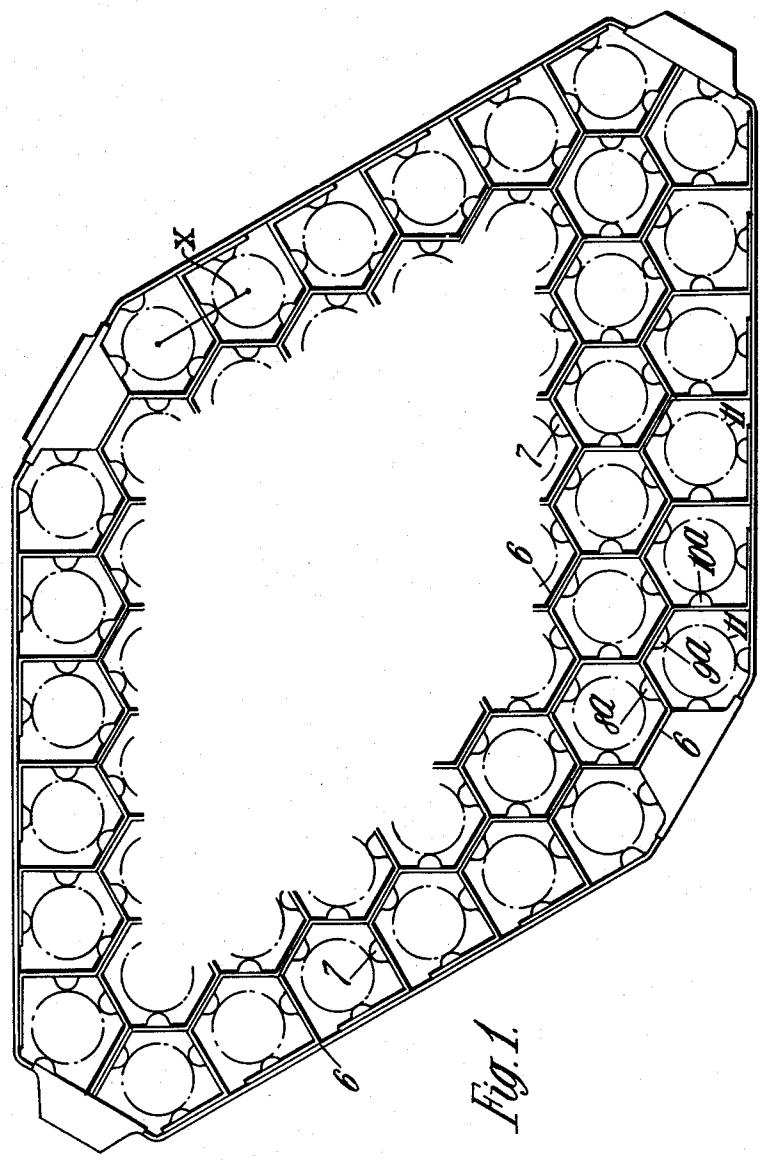

Fig. 1.

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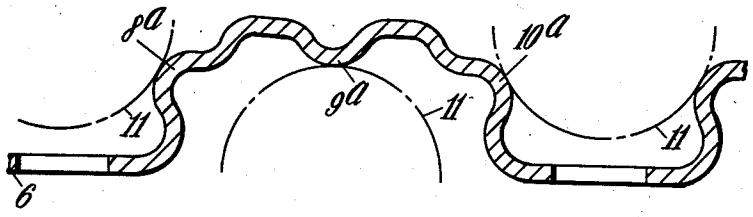

Fig. 2.

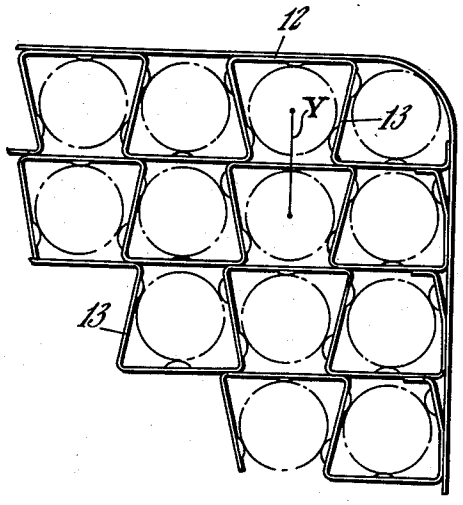

Fig. 3.

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SUPPORTING GRIDS FOR HEAT EXCHANGER ELEMENTS

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3 Claims. (Cl. 165—162)

The object of this invention is to provide a supporting grid for cylindrical heat exchanger elements in a convenient form. It should be noted that the term "cylindrical" is used throughout this specification in its mathematical sense, and is not limited to right cylinders.

A supporting grid in accordance with the invention comprises in combination a plurality of strips corrugated by bends transversely of the strips and interconnected so as to form a multiplicity of polygonal compartments each defined by two strips and integral projections extending from opposite sides of the sheets so as to provide at least three projections in each compartment, the projections being positioned to support the cylindrical heat exchanger elements within the compartments respectively with their axes parallel, and the arrangement being such that a line extending at right angles between the axes of any pair of heat exchangers in adjacent compartments will not pass through more than one projection.

A supporting grid as above set forth ensures that the reverse side of any element-engaging projection is clear of the next element so that the strip is free to yield by flexing to force applied at the projection. Given an adequate width of strip, it can be arranged within the scope of the invention that a projection presented at one face for serving in one compartment is spaced widthwise across the strip from another projection presented at the opposite face for serving in the adjacent compartment, the portion of width intervening between these two projections giving the requisite flexural freedom. It is preferred, however, that such opposite projections are spaced at intervals lengthwise of the strip. In one particular arrangement, projections presented at one face alternate with projections presented by the opposite face.

In the accompanying drawings, FIGURE 1 is an end view illustrating one example, FIGURE 2 is a fragmentary view of one of the strips seen in FIGURE 1 and FIGURE 3 is a view illustrating a modification.

Referring first to FIGURE 1, there is provided a plurality of corrugated strips 6 which are interconnected as shown by any convenient means to provide a plurality of hexagonal compartments. Opposite faces of each strip incorporate integral projections 7, there being three projections in each compartment. A fragment of a strip is shown in FIGURE 2, where the projections 8*a*, 9*a*, 10*a* correspond to projections such as 8*a*, 9*a*, 10*a* in FIGURE 1.

The projections 7 support a plurality of cylindrical

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nuclear fuel elements or other heat exchanger elements 11 within the compartments respectively, and it will be noted that no line extending at right angles between the axes of two elements in adjacent compartments passes through more than one projection. This can be seen by considering a typical line X in FIGURE 1, which passes through one projection 7 only. In this way it is ensured that deformation of one element will not result in the transmission of a force to an adjacent element, so that there is no cumulative error in any direction throughout the supporting grid.

FIGURE 3 illustrates an alternative construction in which strips 12 are interconnected to form four-sided polygons. In this example some walls, such as the wall 13, incorporate two projections, but the above condition regarding lines extending at right angles between the axes of elements in adjacent compartments is still fulfilled, as shown by a typical line Y in FIGURE 3.

In use, the assembly of strips and the elements supported thereby are contained in a housing closed at each end. Coolant is forced through the housing and flows through the spaces between the elements 11 to cool the elements.

Having thus described our invention what we claim as new and desire to secure by Letters Patent is:

1. A supporting grid for cylindrical heat exchanger elements, comprising in combination a plurality of strips corrugated by bends transversely of the strips and interconnected so as to form a multiplicity of polygonal compartments each defined by two strips and integral projections extending from opposite sides of the sheets so as to provide at least three projections in each compartment, the projections being positioned to support the cylindrical heat exchanger elements within the compartments respectively with their axes parallel, and the arrangement being such that a line extending at right angles between the axes of any pair of heat exchangers in adjacent compartments will not pass through more than one projection.

2. A supporting grid as claimed in claim 1, in which projections presented at opposite faces of the same strip are spaced apart lengthwise of the strip.

3. A supporting grid as claimed in claim 2, in which at least some of the strips have projections presented at one face alternating along the length of the respective strip with projections presented at the opposite face.

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