Jan. 7, 1969 J. L. URNER 3,420,296

FINNED TUBE PROTECTOR BAND

Filed April 28, 1967

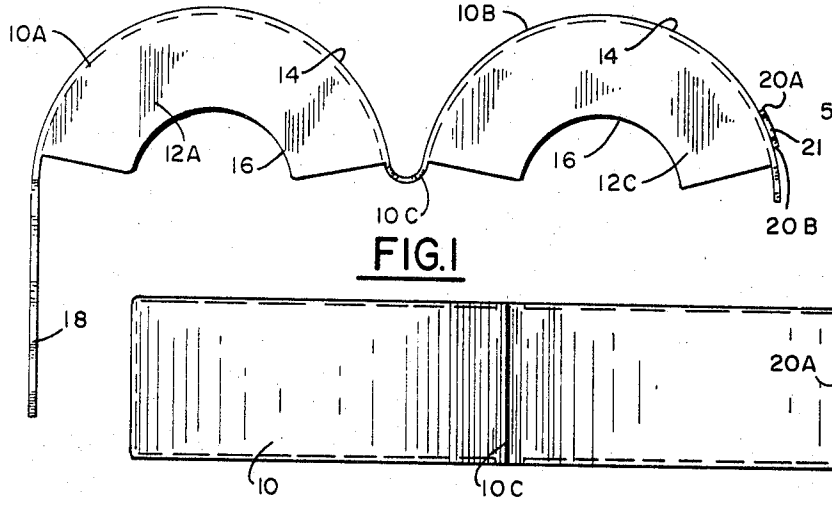


FIG. 1

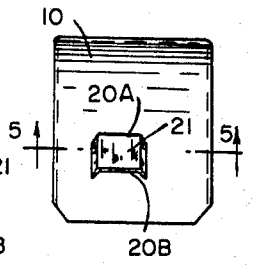


FIG. 3

FIG. 2

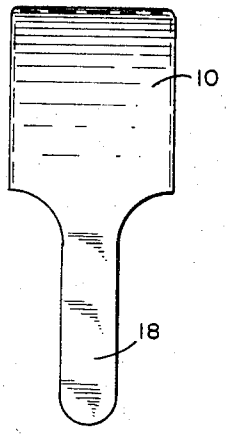


FIG. 4

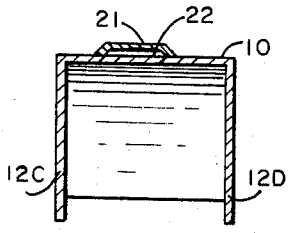


FIG. 5

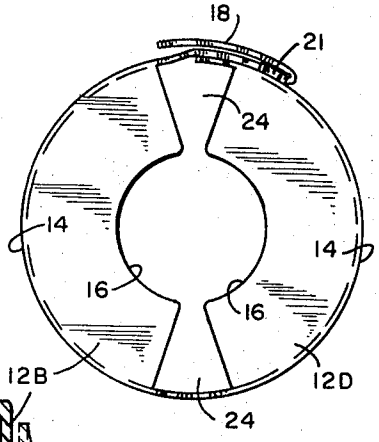


FIG. 6

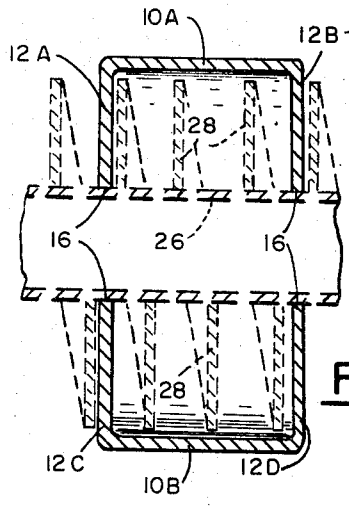


FIG. 7

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FINNED TUBE PROTECTOR BAND

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ABSTRACT OF THE DISCLOSURE

A band for positioning around a finned tube to protect and/or support the tube. The finned tube band includes a back portion formed into two semi-circular portions connected by an intermediate portion adaptable to be hingeably bent and two pairs of spaced apart flat side portions each of a segmented ring configuration, the exterior diameter thereof being slightly greater than the diameter of the tube fins to which the band is to be applied and the interior diameter thereof being preferably equal to the diameter of the tube. The band includes means of securing the ends of the bands together after it is placed about a finned tube.

Cross-reference

This application is not related to any pending application.

Summary

Finned tubes are widely used in industry in the manufacture of air-cooled heat exchangers. Finned tubes consist basically of a tube having fins extending radially therefrom. The fins may be in the forms of discs so that they extend in parallel planes, or most usually the fins are spirally wound upon the tube.

To achieve effective heat transfer, the fins are typically made of metal such as aluminum and are relatively thin, permitting maximum air passage therebetween.

One of the problems in connection with the manufacturing of finned tubes and the subsequent use thereof in the assembly of heat exchangers is that the fins are easily damaged. When long finned tubes are used in heat exchangers it is necessary that they be supported at one or more points intermediate their length, otherwise they will sag. Tube bands keep the fins from intermeshing and becoming entangled with each other and serve to space finned tubes at selected distances to allow correct amounts of air flow over the tubes.

To protect finned tubes it is necessary to provide some device which will support their weight without bearing against the fins. Others have suggested such devices, such as those disclosed in the following United States patents: 1,227,187, 1,704,097, 1,858,101, 2,059,297, 2,166,808, 2,219,161, 2,241,209, 2,332,641, 2,453,567, 2,455,708, 2,471,209, 2,608,388, 2,670,935, 2,775,433, 2,843,363, 2,862,693, 2,976,022, 3,012,761, 3,163,208 and 3,273,638. This list of United States patents is exemplary of the state of the art and provides history and background to the type of device to which this invention is directed.

This invention provides a unique tube band which is superior for a variety of reasons over those disclosed by others, including the ones disclosed in the above listed United States patents.

Description of views

FIGURE 1 is a side elevational view of the band for finned tubes of this invention showing the band ready for use.

FIGURE 2 is a top plan view of the band.

FIGURE 3 is a plan view of one end of the band.

FIGURE 4 is a plan view of the other end of the band.

FIGURE 5 is a cross-sectional view taken along the line 5—5 of FIGURE 3.

FIGURE 6 is a side view of the band as it would be assembled about a finned tube.

FIGURE 7 is a cross-sectional view of the band as fitted on a finned tube shown also in cross-section.

Detailed description

Referring now to the drawings, the band of this invention is formed of a unitary member of sheet metal consisting of a paralleled edge back portion **10** of a length slightly greater than the external circumference of the fins of the tube to which the band is to be applied. The back portion **10** is formed into two semi-circular portions as shown in FIGURE 1, designated as **10A** and **10B**.

Two pairs of spaced apart flat side members **12A** through **12D** are provided (see FIGURE 7). Each of the side members **12A** through **12D** is of a flat segmented ring configuration of exterior diameter slightly greater than the diameter of the fins of the tube to which the band is to be applied. The interior diameter **16** of each side portion is of a diameter at least equal and preferably the same as, the diameter of the tube to which the band is to be applied. Each of the side members is integrally affixed at the exterior circumferential edge thereof to the semi-circular edge of the back member semi-circular portions **10A** and **10B**.

Forming a part of the back portion **10** and connecting the two semi-circular portions **10A** and **10B** is an intermediate portion **10C** adapted to be hingeably bent.

At each end of the back portion **10** means is provided for securing the ends together after the tube band is placed upon a finned tube. An illustrated means of accomplishing this is shown in FIGURES 3, 4 and 5. One end of the back portion **10** terminates in an elongated reduced width tongue portion **18** (see FIGURE 4). At the other end (see FIGURE 3) of the back portion opposite the tongue portion **18** there are two spaced apart slits **20A** and **20B**. The slits **20A** and **20B** are parallel to each other and each is perpendicular to the length of the back portion **10**. That portion **21** of the back portion between the slits **20A** and **20B** is raised above the surface of the back portion to provide an opening **22** thereunder (see FIGURE 5) of a configuration to receive the tongue portion **18**.

The tube band is ready for use as shown in FIGURE 1. In use one or the other halves is placed on a finned tube so that the space between one set of side portions **12** receive a number of fins. The inner circumferential diameter of each side members **12** is preferably the same as the outer diameter as the tube so that as the band is placed upon the tube the inner surfaces **16** engage the exterior of the tube. With one half of the band in engagement with the tube the other half is bent to form substantially a circle around the finned tube as shown in FIGURE 6.

Each of the segment side portions **12** subtends an angle less than 180° so that when the tube band is bent into position about a finned tube slots **24** are provided (see FIGURE 6). Most finned tubes are of the type wherein the fin is wound spirally on the tube. Slots **24** permit the passage of the spiral wound fin material between the side portions **12**.

In the illustrated means of securing the band to the finned tube tongue portion **18** is extended through opening **20** and the extending portion is bent back upon itself as shown in FIGURE 6 to lock the device in place.

The tube band of this invention is characterized by extreme simplicity, economy of construction and ease of use. The band consumes a minimum amount of area around the finned tube and completely protects the fins.

While the invention has been described with a certain degree of particularity it is manifest that many changes may be made in the details of construction and the arrangement of elements without departing from the spirit and scope of the invention. The invention is not limited to the exemplified embodiments, nor to the abstract nor the summary included herein, but only to the claim or claims, including the full range of equivalency to which the claims are entitled.

What is claimed:

1. a tube band for a finned tube wherein the finned tube is of given external diameter and the fins thereon are of a larger external diameter, the tube band comprising:

a unitary member formed of sheet metal comprising

a paralleled edge back portion of a length slightly greater than the circumference of the fins of the tube to which the band is to be applied, the back portion being formed into two semi-circular portions connected by an intermediate portion adapted to be hingeably bent,

two pairs of spaced apart flat side portions each of a segmented ring configuration, the external diameter thereof being slightly greater than the external diameter of the fins of the tube to which the band is to be applied and the interior diameter being at least equal the diameter of the tube to which the band is to be applied, the side members being each integrally affixed at the exterior circumferential edge thereof to a semi-circular edge of said back member, said side members being configured to be positioned between fins as the band is placed upon a finned tube, the inner semi-circular edges of said side members engaging the exterior surface of the tube to which the band is to be applied, and

means at each end of said back member of securing the ends thereof to each other as the band is positioned on a finned tube.

2. A tube band for a finned tube according to claim **1** wherein said means of securing the ends of the back portion to each other as the band is positioned on a finned tube include the arrangement wherein:

one end of said back portion terminates in an integral reduced width elongated tongue portion, and including

spaced slits in said back portion adjacent the end thereof opposite said tongue portion, said slits being perpendicular the length of said back portion and less than the width thereof, the portion between the slits being raised above the surface of back portion providing an opening thereunder of a dimension to receive said tongue portion, the tongue portion being extendable through said opening as the tube band is positioned on a finned tube, the tongue portion after extending through said opening being bendable to lie parallel itself and thereby secure the ends of the back member together.

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