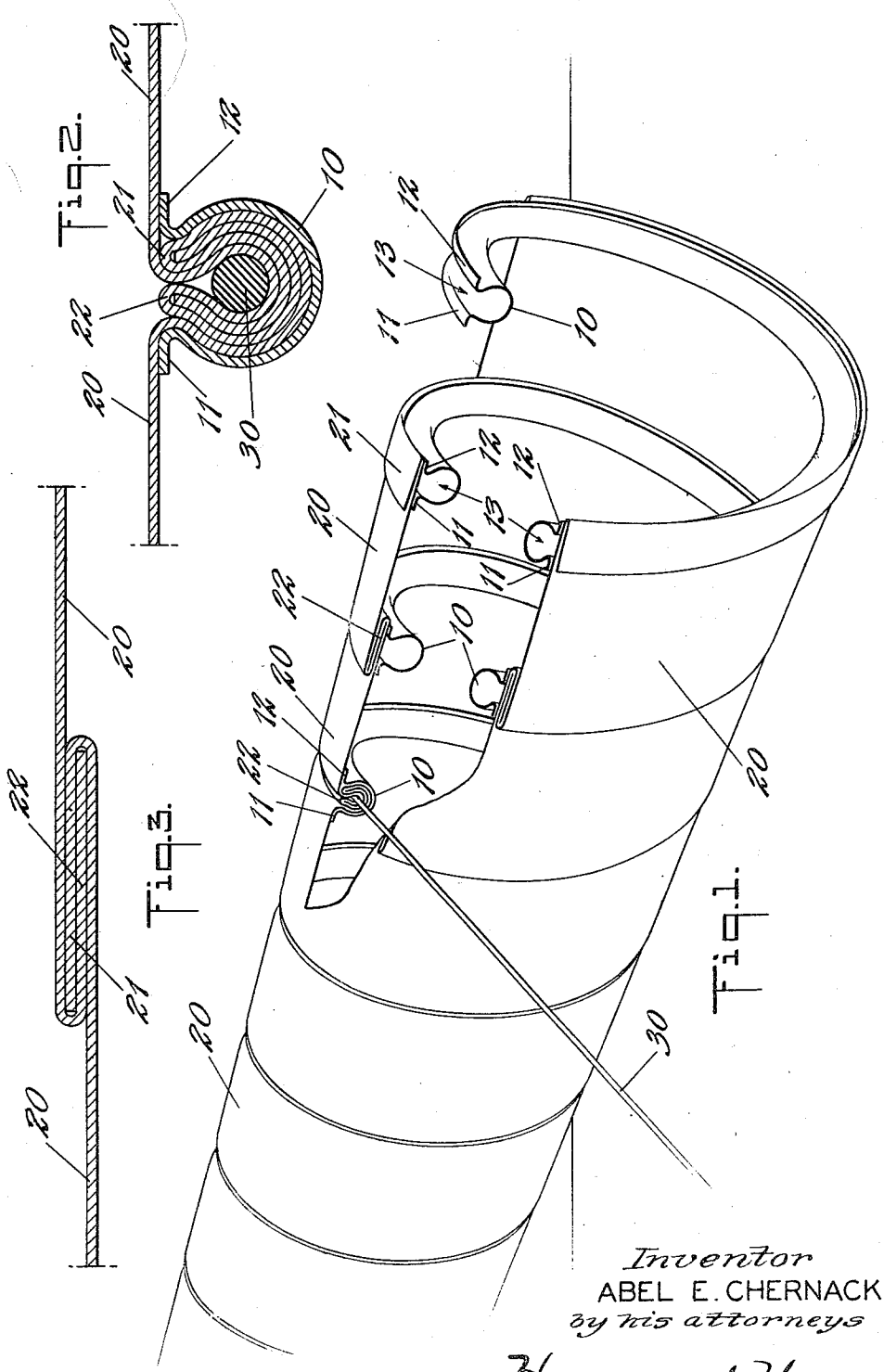
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COLLAPSIBLE TUBING AND METHOD OF PRODUCING THE SAME

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COLLAPSIBLE TUBING AND METHOD OF PRODUCING THE SAME

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6 Claims. (Cl. 138—53)

This invention relates to tubing and more particularly to flexible, collapsible tubing for conducting large volumes of heated air under low pressures.

With the development of the airplane to its present large dimensions there has arisen need for flexible lightweight tubing for use in heating the engines, wings and windows. The large volume of heated air required necessitates a tubing of large diameter, which is preferably collapsible for convenient handling, while the temperature range to which such tubing is subjected prevents the use of materials which tend to become hard or brittle and crack at low temperatures, or the use of adhesives which deteriorate with age or soften under heat. However, the tubing is of a construction which is not limited to use with tubing for heating purposes but may be used with tubing for other purposes where usual temperatures are met and the usual materials can be used.

It is an object of this invention to provide a flexible, collapsible tubing constructed of materials which remain unaffected by temperature changes throughout the entire temperature range to which the tubing is subjected in use; which is so constructed that the use of adhesives is unnecessary and the tubing remains sealed at all times; which is so constructed that there is no danger of contacting heated metal in the handling of the tubing; which can be manufactured of the diameters and in the continuous lengths desired; and which can be manufactured by a method suitable for rapid and economical production in commercial sizes and lengths. It is also an object of this invention to provide an improved method of manufacturing tubing of the class described.

In the drawing in which a tubing of preferred construction is illustrated,

Figure 1 is a perspective view of a short section of tubing constructed in accordance with this invention, a part of the tubing being broken away in order to show more clearly various stages in the manufacture of the tubing;

Figure 2 is a sectional view, drawn to a larger scale, through the seam of the finished tubing; and

Figure 3 is a sectional view, drawn to a larger scale, of the interlocking joint formed in the covering material before the application of the binding wire cord.

As shown in the drawing, tubing in accordance with this invention comprises an inner spiral 10 consisting of a metal strip of a trough-shape with a substantially circular cross-section and having the side edges of the strip bent outwardly to form narrow flanges 11 and 12 at opposite sides of the opening 13. The metal spiral 10 is covered with a spirally wound strip 20 of a fiber glass, textile or other suitable material which is of slightly greater width than the pitch of the spiral 10 and has its opposite edges folded inwardly, as at 21 and 22, adjacent the opposite faces of the strip. In wrapping the strip 20 on the spiral 10, the inwardly folded edge portions are interlocked as shown in Fig. 3, the width of the strip 20, when applied, being such that the interlocked edge portions of the strip 20 lie on the spiral 10, as shown in Fig. 1.

A binding means 30, of wire, cord or other suitable material, is then applied, being wrapped about the covering strip 20 on the interlocked edge portions in line with the opening 13 in the metal spiral 10 and under sufficient tension to enlarge the opening 13 and draw the interlocked edges of the strip 20 into the trough of the spiral 10. As the interlocked edges of the strip 20 are drawn through the opening 13 they are folded about the binding means 30 and then the partial closing of the opening 13, by the resilience of the metal of the spiral 10, serves to cover the binding means with the interlocked portions of the strip 20 and conceal the binding means 30 and cause the spiral 10 to cooperate with the binding means 30 in locking the interlocked edges of the strip 20 in the trough of the spiral 10.

The binding of the interlocked edges of the strip 20 in the spiral 10 prevents the opening of the tubing at the joint in the covering strip 20, and the covering of the metal of the binding means or wire 30 and spiral 10 by the covering strip 20 insures against contact with heated metal in handling. Tubing thus constructed is of light weight, even for large sizes, and collapsible so that long lengths of large size tubing can be conveniently handled or packed for shipment.

What is claimed is:

1. Tubing comprising a spiral having a trough-shaped cross section, a spirally wound covering strip on said spiral, said covering strip having adjacent overlapping edges interlocked, and binding means securing the interlocked edges of said covering strip in said spiral.

2. Tubing comprising a spiral of trough-shaped cross section, a spirally wound covering strip on said spiral, said covering strip having its edges overlapping along said spiral, and an outer binding means securing the overlapping edges of said strip in the trough of said spiral.

3. Tubing comprising a spiral of trough-shaped cross section, a spirally wound covering strip on said spiral, said covering strip having overlapping interlocked edges, and an outer binding means securing said interlocked edges in the trough of said spiral, said interlocked edges forming a covering for said binding means.

4. In a method of forming a tubing, the steps of forming a spiral from a continuous trough-shaped strip, wrapping a covering strip about said spiral with its edges overlapping over the trough of said spiral, and wrapping a binding means about the overlapping edges of said covering strip under sufficient tension to force the edges of the covering strip into the trough of the spiral.

5. In a method of forming a tubing, the steps of forming a continuous spiral from a trough-shaped strip, wrapping a covering strip about said spiral with the edges of said covering strip overlapping along said spiral, wrapping a binding means about said covering strip along said spiral, and forcing the overlapping strip edges into the trough of said spiral by said binding means.

6. In a method of forming a tubing, the steps of forming a continuous spiral from a trough-shaped strip, wrapping a covering strip about said spiral, interlocking the adjacent edges of said covering strip along said spiral, wrapping a binding means about said covering strip along said spiral and under sufficient tension to force the interlocked strip edges into the trough of said spiral and securing the interlocked strip edges in the trough of said spiral by the joint action of said spiral and binding means.

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