June 12, 1945. L. E. WHITAKER 2,378,272

AIR CONDUIT

Filed June 13, 1942

Fig. 1.

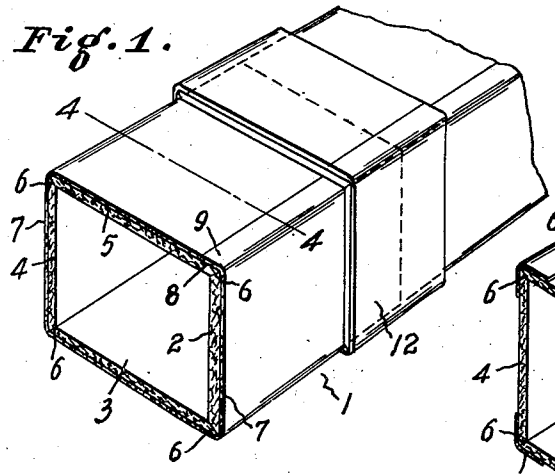


Fig. 2.

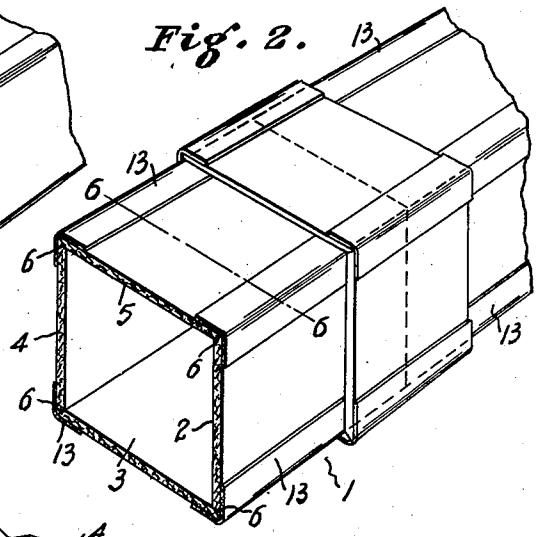


Fig. 3.

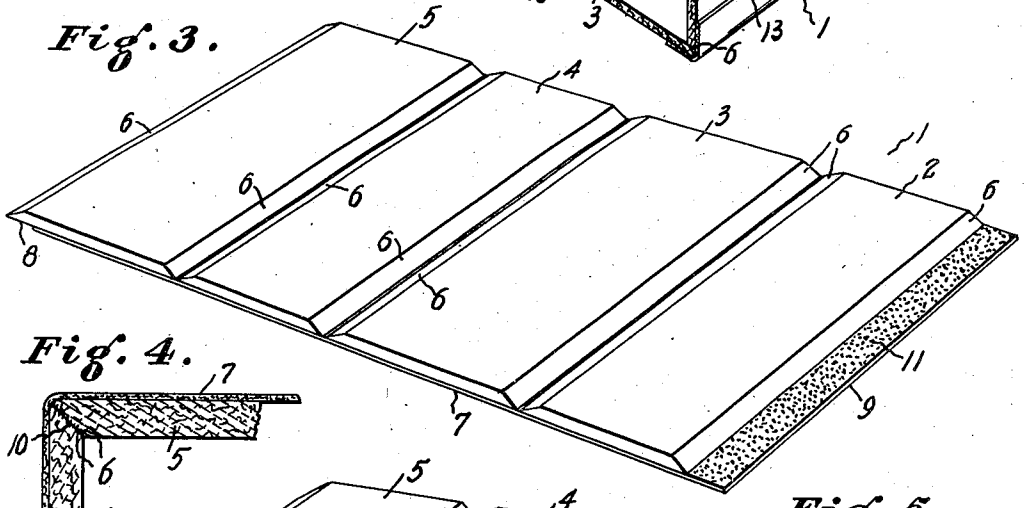


Fig. 4.

Fig. 5.

Fig. 6.

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AIR CONDUIT

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Application June 13, 1942, Serial No. 446,921

2 Claims. (Cl. 137—78)

This invention relates to air conduits, and more particularly to air conduits which are made from a plurality of side pieces that are cut from fibrous sheet material into suitable lengths, assembled into blanks, and then folded to form conduit sections. The longitudinal edges are beveled or mitered and have adhesive applied thereto to bond the adjacent edges and rigidify the sections.

The blanks are preferably cut from fibrous sheets of suitable material and have the side pieces adhered to a single backing or to several ribbons spaced apart to be adhered to the longitudinal margins of adjacent side pieces. Or, the side pieces and the backing or ribbons may be first cut into lengths and then assembled. The blanks can be folded into conduit sections at the time of their manufacture or they can be stacked or packaged flat into bundles and shipped to the job in that form to be folded into form and assembled where the conduits are to be installed.

For a better understanding of the invention, reference may be made to the accompanying drawing in which:

Fig. 1 is a perspective view of a portion of a conduit composed of sections assembled in end to end relation;

Fig. 2 is a perspective, similar to Fig. 1, but another embodiment of the sections;

Fig. 3 is a perspective view of a blank which is to be folded into a conduit section, embodying the invention;

Fig. 4 is a cross sectional view of a corner portion on line 4—4 of Fig. 1;

Fig. 5 is a perspective view of a blank similar to Fig. 3 but of the embodiment of Fig 2; and

Fig. 6 is a cross sectional view of a corner portion on line 6—6 of Fig. 2.

Referring to the drawing, in which like numerals are used to designate like parts, blanks 1 are cut from an endless strip fabricated on a board or assembling machine. A blank comprises a plurality of sides 2, 3, 4, and 5. The conduits are usually rectangular in configuration.

The sides may be of any desired material, but in conduits are preferably of asbestos paper, asbestos millboard or other suitable fire resistant material. They may be of single or multiple construction, depending on the thickness of the walls that the conduit is to have. Where composed of asbestos paper, the wall pieces are preferably of several plies adhered together. Where they are of millboard, one ply is ordinarily of sufficient thickness. The sides are beveled along the longitudinal edges at 6 and are adhered to a backing sheet 7, which is also preferably of asbestos paper, woven fabrics, kraft, or some other strong flexible material.

The backing sheet is preferably offset at the longitudinal edge of the strip which is on the end of the blank to provide uncovered portion 8 and a lap portion 9 on the strip which is on the opposite end of the blank. The longitudinal edges of the side pieces are beveled so that when the blank is folded to a rectangular position, the sides of adjacent strips are tight fitting and the lap portion 9 will cover the corner formed by the marginal pieces 2 and 5 and abut the opposite edge of the backing sheet.

Adhesive 10 of a waterproof character is applied to the beveled sides so that the sides will be adhered at the abutting corners and seal the corner seams. The adhesive 10 is preferably of a kind which sets and hardens, thereby making the conduit section rigid and strong after being folded and adhered. The adhesive 10 may be laid down in a bead or ribbon, continuously or at intervals, in a sufficient amount which, when squeezed by the edge of the sides in folding the blanks, will fill and seal the corner joint or seam between the adjacent beveled edges. A conventional adhesive 11 may be applied to the lap 9 to be adhered when the blanks are folded by moistening the adhesive on the lap. This may be any type, such as glue, which may be brought to adhesive condition by being moistened.

The waterproof adhesive which is applied at the corner edges is of the type which sets, and since some time is required for it to set and harden, the section blank after being folded to a rectangular position may advantageously be held in a form or holder until the cement has set and hardened. Thereafter, the section is very rigid and solid and is self-sustaining without danger of collapsing.

Two conduit sections may be coupled together by collar 12 which is of the same construction as the conduit sections but of larger cross section. It has four side strips secured to a backing and these are folded with one edge of the backing lapping the corner and abutting its opposite set back end.

For ordinary purposes a single wall conduit is sufficient with the adjacent sections coupled together by the collar. If, however, a doubled wall conduit is desired, the collars may be lengths corresponding to the conduit sections so that they too can be laid in abutting end to end relation and serve as an outer wall within which the smaller conduit sections are telescoped.

The modified form of Figs. 2, 5, and 6 is gen-

erally the same as that disclosed in Figs. 1, 3, and 4, the only difference being that the side pieces are held together by spaced-apart separate strips 13 applied along the longitudinal joints rather than being a backing sheet for the strips as well as the joints therebetween. The general construction, assembly, and use are the same.

Any number of blanks may be stacked or bundled into packages to be shipped to the place of use for folding and assembling into conduits. When it is desired to use the sections and assemble them into conduits, the blanks may be taken from the bundle and folded in the same manner that they would be if folded and formed into conduits at the time that the blanks were manufactured.

The invention especially lends itself to the manufacture of conduits which may either be assembled at the time of manufacture or may be packaged and assembled on the job.

A suitable adhesive for the beveled edges comprises a composition of about 150 lbs. of silicate of soda (40° Baumé 1:3 ratio), 65 lbs. of Portland cement (Q—22 Columbia brand), 10 lbs. of tri-sodium phosphate, and 3 lbs. of sodium fluoride. These are intimately commingled by any suitable mixer. The silicate of soda is first mixed with water and then the tri-sodium phosphate is stirred in. Sodium fluoride is preferably first mixed with water to moisten it before being added to the silicate of soda, the initial wetting or moistening preventing the silicate of soda from forming a reversible gel with the stabilizer. The cement or other reactant material used to impart waterproofness to the adhesive composition is then added to the silicate of soda and stirred together sufficiently to disperse the cement powder through the silicate of soda and reduce the mixture to a creamy consistency, smooth and free from lumps. Other alkali phosphates and fluorides (e. g. potassium salts) work equally as well as do sodium salts. This cement typifies one requiring no heating. It has a working life in excess of eight hours, after which it sets up or hydrates to a waterproof condition.

Having described the invention and preferred embodiments illustrating it,

I claim:

1. An air conduit adapted to be shipped flat and assembled on the job, comprising sections having a plurality of fire resistant side pieces provided with beveled longitudinal edges in contiguous relation, a flexible joint covering means for holding the side pieces together, and a waterproof self-setting adhesive applied to the longitudinal edges of the side pieces, when the conduit is assembled, for bonding and sealing the joints between the side pieces when said side pieces are folded in conduit form.

2. An air conduit adapted to be shipped flat and assembled on the job, comprising sections having a plurality of fire resistant side pieces provided with longitudinal edges in contiguous relation, a flexible joint covering means for holding the side pieces together, and a waterproof self-setting adhesive applied to the longitudinal edges of the side pieces, when the conduit is assembled, for bonding and sealing the joints between the side pieces when said side pieces are folded in conduit form.

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