May 14, 1963 J. H. SCHMIDT 3,089,805

FLUE COVERING PROCESS

Filed Sept. 12, 1955

FIG. 1

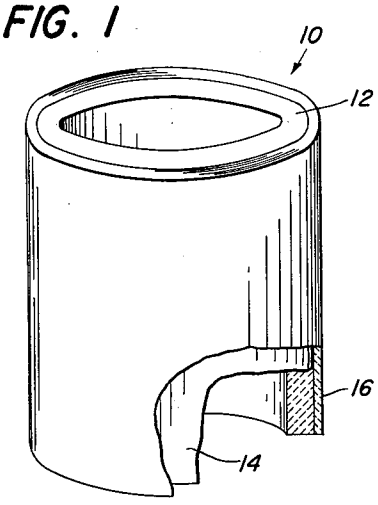


FIG. 2

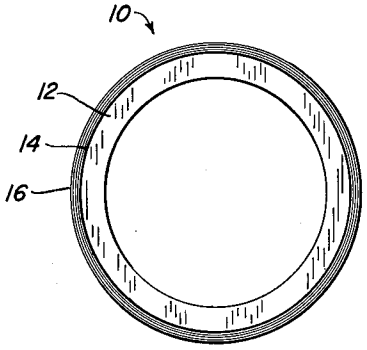


FIG. 3

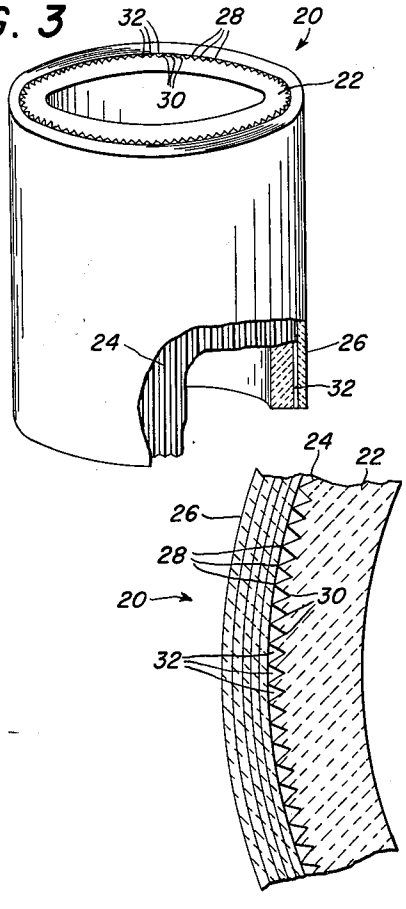


FIG. 4

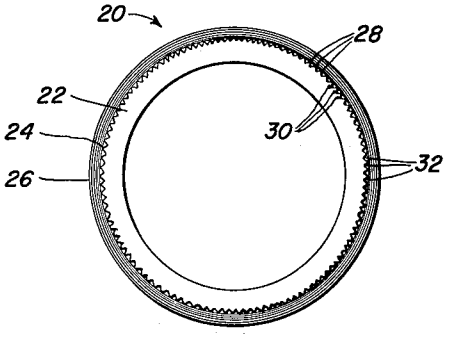


FIG. 5

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FLUE COVERING PROCESS

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1 Claim. (Cl. 156—187)

This invention relates to a chimney and more particularly to a chimney of the fabricated, sectionalized type, one familiar example of which is erected on the construction job from a series of prefabricated tubular sections assembled coaxially or end-to-end.

One of the important objects of the invention relates to a simple and inexpensive chimney, and/or section thereof, that may be economically manufactured of lightweight material having all the necessary fire-resistant and insulation properties, primarily by a construction utilizing a tubular core of refractory material or its equivalent, such as fire clay tile, to which an outer layer or wrapping of fire-resistant and insulating material, such as asbestos cement, is applied and adhered to afford a unitary structure in connection with the installation and use of which additional safeguards such as fire-proof panels, insulating shields, etc. are unnecessary.

It is a further object of the invention to provide such structure by the application or wrapping of the outer layer on the core while said layer is in a plastic state, the operation preferably providing the laminations, after which the outer layer subsequently hardens or sets up to afford a chimney section having a tough exterior not likely to fracture in handling and use.

In a modified form of the invention, it is a significant feature that the exterior peripheral surface of the tubular core is roughened, as by serrations or teeth, to afford pockets or valleys, preferably in the form of grooves, which are bridged by the external layer so that such pockets create air spaces and thus implement the insulating characteristics of the layer or wrapping. Moreover, the material of the core and that of the layer have substantially the same coefficient of expansion, but the circumferential or peripheral expansion of the layer is greater than that of the core because of the greater circumferential or peripheral dimension of the former. However, the spaces over which the layer bridges afford portions of the layer not locally adhered to the core, which portions are thus enabled to expand and contract with substantial localized freedom from expansion and contraction of the core, thereby avoiding fracture, splitting etc. of the layer.

Other objects and features of the invention, as well as the significance of the details of construction of what are now regarded as preferred embodiments of the invention, will appear from the ensuing specification and accompanying drawing, the several figures of which are described immediately below.

FIGURE 1 is a perspective, with a portion broken away and partly in section, of one form of chimney.

FIGURE 2 is an enlarged end view of the structure of FIGURE 1.

FIGURE 3 is similar to FIGURE 1 but shows a modified form of the invention.

FIGURE 4 is an enlarged end view of the structure of FIGURE 3.

FIGURE 5 is a still further enlarged, fragmentary section of the structure of FIGURES 3 and 4.

In FIGURES 1 and 2, the chimney, or section thereof, is designated at **10** as comprising a tubular core **12**, having an outer peripheral surface **14**, and an external covering or layer **16** wrapped or applied on said core. The core **12** is shown as of circular section but it could be of

any other shape. The layer **16** will concentrically follow the shape of the core. As will be appreciated, a chimney structure is erected from several coaxial lengths or sections **10**, all of which are prefabricated in the interests of minimizing on-the-job labor and expense.

The core **12** is of refractory material, such as fire clay, capable of withstanding temperatures in the neighborhood of 2100° F., and the external layer **16** is of fire-resistant material having high insulating properties; e.g., asbestos cement. This layer is preferably laminated or wrapped onto the core from a sheet of asbestos cement formed by any of the well-known processes and is therefore applied when wet or in a plastic state. However, upon curing, it sets up or hardens into a tough fibrous coating virtually impervious to fracture or other damage in handling and usage. The shrinkage of the layer when drying causes it to adhere to the surface **14** of the core **12** and the core and layer become in effect an integral unit. In the installation and use of the chimney, the layer **16** affords such high fire-proofing and insulating qualities as to render unnecessary the addition of other safeguards and the chimney may therefore have zero spacing as respects even wooden structural members. In the design disclosed here, the thickness of the layer is about one-half that of the wall of the core; although, variations are permitted.

In that form of the invention shown in FIGURES 3, 4 and 5, a chimney or section thereof, as at **20**, has a tubular core **22**, of refractory material like that of the core **12**, and having an outer peripheral surface **24** to which is applied or about which is wrapped a preferably laminated external layer **26** similar in characteristics to the layer **16**. However, there are important differences in the structure. The outer surface **24** of the core **22** is roughened to afford a plurality of pockets. This is preferably accomplished by a plurality of uniformly peripherally spaced serrations or teeth, running lengthwise of the core, which produce alternate peaks **28** and valleys **30**. The inner periphery of the layer **26** bridges the peaks so that air spaces **32** are achieved between neighboring peaks **28** (FIGURE 5).

These spaces have significant purposes. First, they add to the insulation characteristics of the assembly, being disposed between the core **22** and layer **26**. Second, the bridging of the teeth or peaks by the layer improves the qualities of the layer in resisting fracture, splitting, etc. Although the coefficient of expansion of the layer **26** is substantially the same as that of the core **22**, the former is subject to greater circumferential expansion because of its greater circumferential dimension. But the inner portions of the layer that bridge the teeth or peaks do not adhere to circumferential portions of the core between the peaks, being instead spaced radially from the valleys by the configuration of the serrations. Because of this, localized differences in expansion are minimized.

In the preferred embodiment of FIGURES 3, 4 and 5, the layer **26** has a thickness on the order of one-half that of the core **22**; although, a layer of reduced thickness also affords excellent results. The depth of the serrations is shown as being substantially one-third, but may be on the order of one-quarter to one-half, the thickness of the layer, and the spacing between the teeth is the same; although, variations are permitted in accordance with changes in overall dimensions. In the process of wrapping or otherwise applying the layer **26**, the roughened surface **24** affords "traction" in picking up the sheet or blanket of asbestos cement, particularly where the process is one involving the rolling of the core to cause application of the layer.

Other features of the invention, apart from those enumerated herein, will undoubtedly occur to those versed in the art, as will many variations in the preferred inventive embodiments disclosed, all of which fall within the principles and scope of the invention.

What is claimed is:

A method for forming a chimney comprising first forming a flue comprising fire clay having integral peaks and valleys on the periphery thereof running lengthwise of the flue, wrapping a plurality of layers of wet asbestos-cement sheet around the flue contacting the peaks only, and drying the asbestos-cement sheet.

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