United States Patent [19]

Beasey

[11] **3,768,457**

[45] **Oct. 30, 1973**

[54] **FIREPLACE CONSTRUCTION**

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[73] Assignee: **American Standard Inc.**, New York, N.Y.

[22] Filed: **Dec. 13, 1972**

[21] Appl. No.: **314,804**

[52] **U.S. Cl.** **126/120**, 126/318, 285/331, 285/332, 285/424

[51] **Int. Cl.** **F24b 1/18**

[58] **Field of Search** 126/120, 121, 314, 126/318; 285/331, 332, 424

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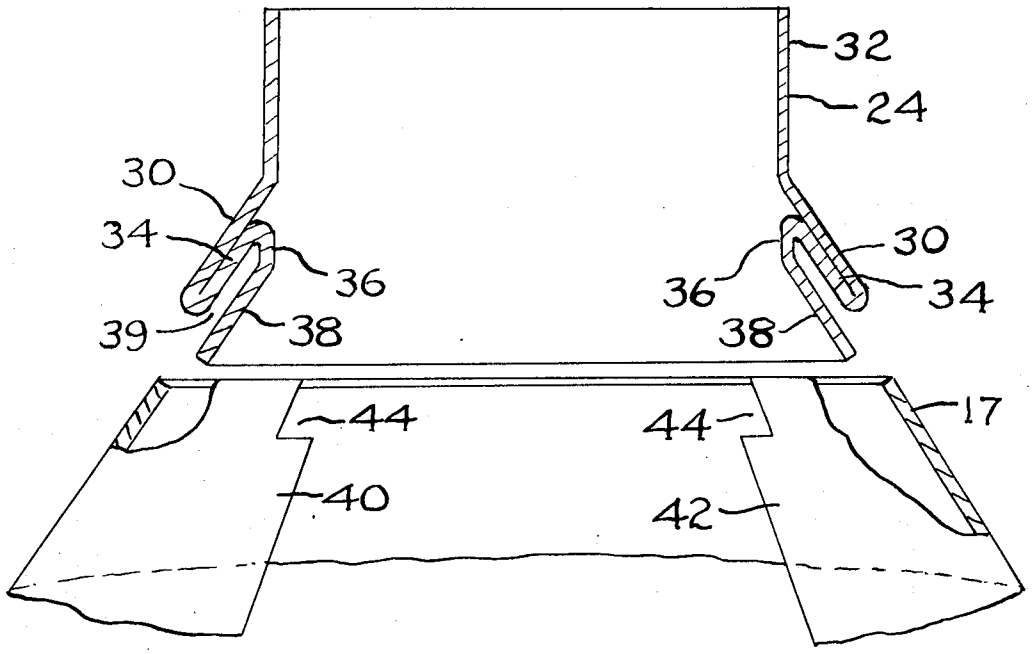
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Assistant Examiner—Peter D. Ferguson
Attorney—John E. McRae

[57] **ABSTRACT**

A fireplace comprising a conical hood connected at its upper end to a smoke pipe collar by means of a bead-flange clamp joint. The joint provides a smoke seal while avoiding the need for a continuous circumferential weld. The joint surfaces are devoid of internal crevices or projections that would obstruct air flow or tend to collect moisture or other corrosive materials.

2 Claims, 9 Drawing Figures



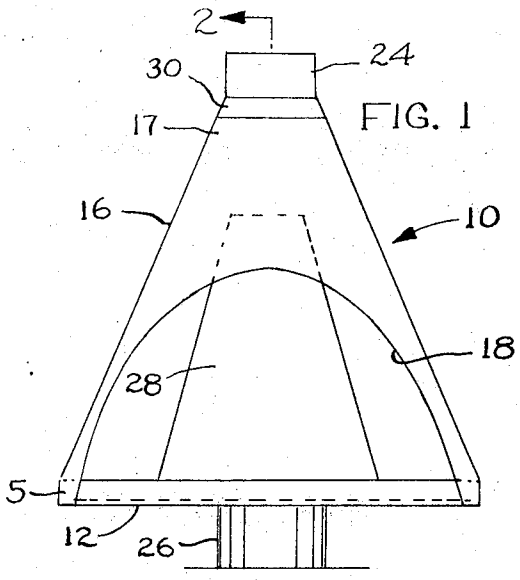


FIG. 1

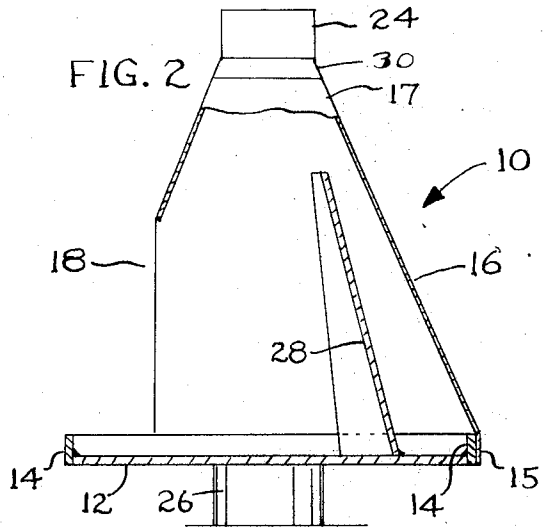


FIG. 2

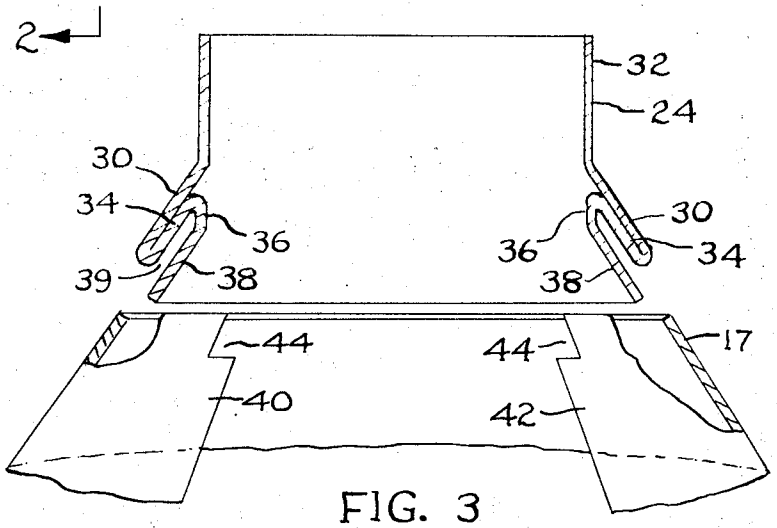


FIG. 3

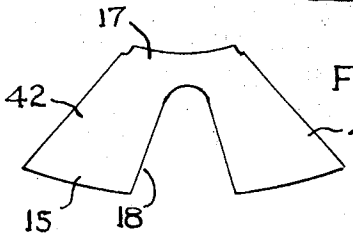


FIG. 5

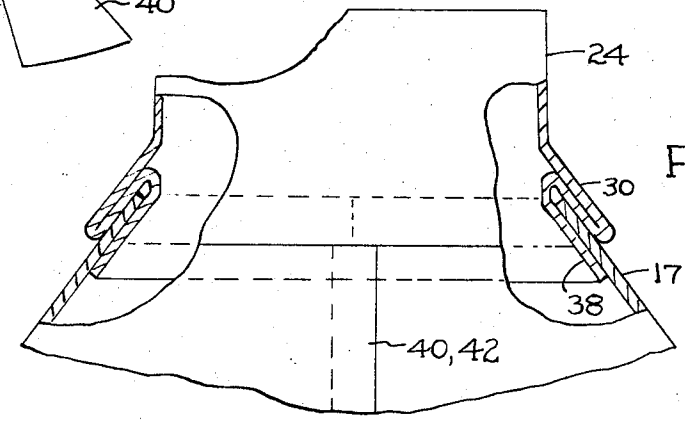


FIG. 4

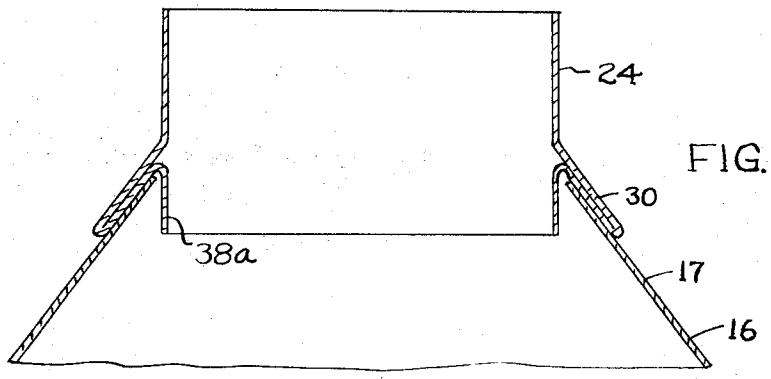


FIG. 6

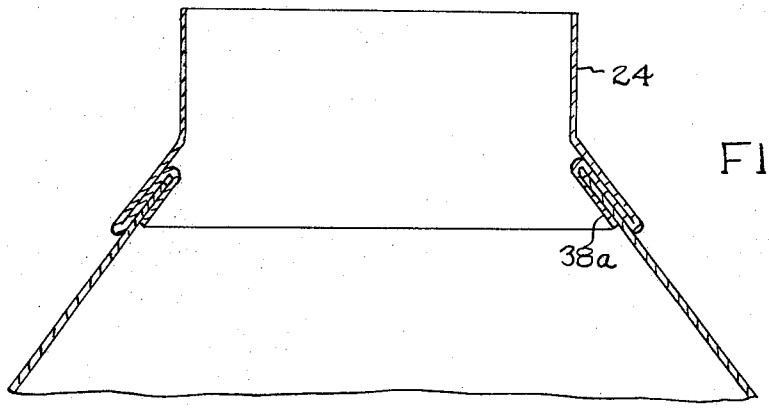


FIG. 7

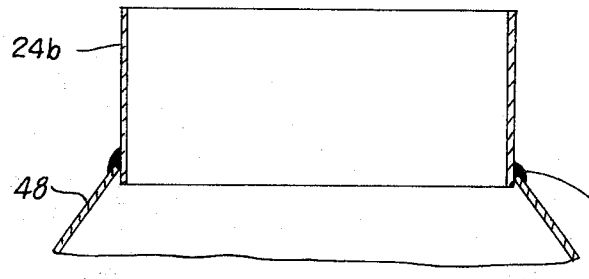


FIG. 8
PRIOR ART

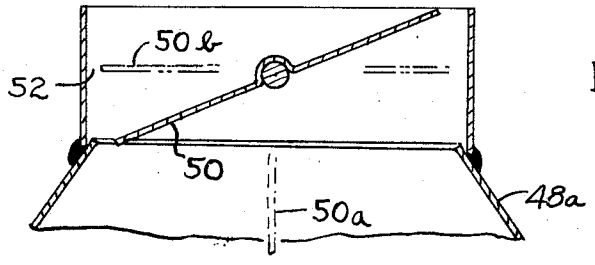


FIG. 9
PRIOR ART

FIREPLACE CONSTRUCTION

THE INVENTION

The invention provides a collar-hood joint wherein the collar includes an upper roll-formed bead and a lower roll-formed flange. The bead and flange are spaced from one another to form an annular groove adapted to receive the upper inner edge area of a tapered fireplace hood. The groove-forming surfaces tightly grip opposite surfaces of the hood wall to form a smoke seal.

THE DRAWINGS

FIG. 1 is a front elevational view of a free standing fireplace embodying the invention;

FIG. 2 is a sectional view taken on line 2—2 in FIG. 1;

FIGS. 3 and 4 are enlarged views of a hood-collar joint used in the FIG. 1 embodiment, FIG. 3 is taken during assembly of the joint, while FIG. 4 is taken after completion of the joint;

FIG. 5 is a plan view of a hood-forming sheet used in the FIG. 1 structure, taken with the sheet in a flat condition;

FIGS. 6 and 7 are views similar to FIGS. 3 and 4, but showing another joint embodying the invention;

FIGS. 8 and 9 are sectional views illustrating prior art joints used in effecting connections between fireplace hoods and smoke pipe collars.

FIGS. 1 and 2

FIG. 1 illustrates a fireplace **10** comprising a heavy gage base pan or plate **12** having a peripheral rim wall **14** welded at spaced points to the pan edge surface. Wall **14** connects to the lower edge area **15** of an upwardly tapering fireplace hood formed of lighter gage sheet metal than the pan or rim. Screws, rivets, or welds may be used to form the connection.

A frontal portion of the hood sheet is cut out to form a fireplace opening **18.** The hood is tapered from its lower end **15** to its upper end **17.** Lower end **15** of the hood conforms to the plan dimension of pan **12,** while upper end **17** of the hood is of frustro-conical configuration. Ordinarily pan **12** will be circular or rectangular or elliptical, depending on ornamental considerations and desired locations of the fireplace in the room (in a corner, along one room wall, or in the center of the room). The frustro-conical upper end of the hood effects a sealed joint with a cylindrical smoke pipe collar **24.**

The fireplace is "free standing" in the sense that it stands by itself in the room rather than being built into the wall. Ordinarily it is connected to a supporting pedestal **26,** although it can be suspended from the ceiling by means of chains (not shown). The fireplace usually has a height in the neighborhood of three to five feet, leaving a superjacent space varying from about four to ten feet for a sectional smoke pipe (not shown) extending upwardly from collar **24.** The smoke pipe telescopes onto and over the upper end of the illustrated collar **24.**

Pedestal **26** serves to space pan **12** from the room floor, and thereby prevents the heated pan surface from burning or scorching the floor surface. Scorching or discoloration of the hood **16** surface is prevented by means of an upstanding wall or baffle **28** suitably welded to pan **12** and located forwardly from the rear

surface of the hood. Wall **28** has no connection with hood **16;** it acts merely as a radiant heat shield to direct radiant heat through opening **18** and away from the hood **16** surfaces. Ordinarily the outer surfaces of hood **16** and collar **24** are porcelainized in bright eye-catching colors such as red, gold, green or white; any scorching of the hood **16** surfaces could discolor the porcelainized surface and also make it unsafe to touch—hence the use of shield **28.**

THE INVENTION

This invention pertains to a low cost method of connecting the smoke pipe collar **24** to the upper end of hood **16.** As shown in FIG. **3,** the collar comprises a cylindrical sheet metal element **24** having a first annular wall **30** extending outwardly and downwardly at an acute angle to the main collar side wall **32.** The outer edge of wall **30** connects to a second annular wall **34** that extends upwardly along the wall **30** inner surface. A third annular wall **36** extends from the inner edge of wall **34** downwardly in general alignment with wall **32,** and thence outwardly and downwardly, as at **38,** parallel to walls **30** and **34.** The annular space between walls **34** and **38** forms an annular groove **39** for reception of the frustro-conical upper edge area of hood **16.**

Hood **16** is formed from a single sheet of metal cut in the flat to the shape shown generally in FIG. **5.** The sheet is subsequently bent or curved into the frustro-conical shape so that side edges **40** and **42** overlap one another to form a seam extending from upper edge **17** to lower edge **15** at the rear of the hood.

Initially the side edges **40** and **42** of the fully-formed hood are left unconnected. The formed hood is positioned upright with side edges **40** and **42** spread apart as shown in FIG. **3.** The fully-formed collar **24** is then lowered from the FIG. **3** detached position downwardly toward the FIG. **4** assembled position.

As soon as the lower edge portion of wall **38** is located within the space encompassed by frustroconical wall portion **17** the hood is released to permit the hood wall surfaces to move inwardly against the outer surface of wall **38,** as in the fashion of a C-shaped tension spring. With the hood wall engaged with wall **38** the collar **24** can be moved downwardly to the FIG. **4** position in which the edges **40** and **42** are overlapped. One or both of edges **40** and **42** may be pre-bent slightly to facilitate the desired overlapment. The extreme upper corner sections **44** of edges **40** and **42** may be cut away to avoid interference between the meeting edge areas located within groove **39.** The width of groove **39** is chosen to correspond to the wall thickness of hood **16** so that the hood wall enjoys a tight fit within the groove.

After the parts have been meshed together into the FIG. **4** relationship the overlapped edges **40** and **42** are welded together along their length to form a unit hood structure. Thereafter the hood structure may be connected to pan rim **14.**

FIGS. 6 and 7

FIG. **6** shows a collar that is somewhat similar to the FIG. **3** collar except that wall **38*a*** is cylindrical instead of frustro-conical. Wall **38*a*** is also somewhat shorter than the corresponding wall **38.**

The FIG. **6** collar is positioned on the hood after the hood side edges **40** and **42** have been welded together. With the hood positioned on the collar as shown in

FIG. 6, axially-acting dies (not shown) are operated to deform wall 38*a* outwardly to the FIG. 7 position, thereby locking the collar onto the hood.

The FIG. 7 construction is similar in a structural sense to the FIG. 4 structure except for the shortened nature of wall 38*a*. The shorter wall is used to minimize axial cracks that might otherwise form in wall 38*a* due to circumferential stretching of the wall as it is reconfigured from the FIG. 6 shape to the FIG. 7 shape.

FIG. 8

FIG. 8 illustrates a prior art construction wherein a cylindrical collar 24*b* extends downwardly into the hood. A continuous seam weld 46 extends around the outer surface of the collar-hood joint to form a smoke-tight joint.

One disadvantage of the FIG. 8 arrangement is the cost of the welding and grinding required to form a smooth ornamental surface. The weld is visible and hence must be ground smooth before the hood and collar surfaces are porcelainized.

The porcelainizing operation involves the application of two or more coats of fused enamel frit, followed by controlled cooling or heat treatment. Experience shows that occasionally the weld material will cool and contract at a different rate or to a different degree than the adjacent metal surfaces so as to crack the porcelain and/or loosen the joints so that it is no longer smoke-tight.

Another disadvantage of the FIG. 8 structure is the fact that the lower edge of the collar necessarily has to extend at least a slight distance below the upper edge of the hood if the collar is to be certain of welding correctly to the hood, taking into account the variances possible in normal shop practice.

It might also be noted that the downward projection of the collar inside the hood forms a possible obstruction to the upflow of smoke as it proceeds from the smoke-guiding roof surface 48 of the hood up into the collar. Ordinarily the collar has a relatively small diameter, on the order of 7 inch to 11 inch, so that any internal obstructions that would cause turbulence and otherwise interfere with the thermal draft should be avoided as much as possible. This is difficult to achieve on a consistent basis when the joint is welded.

The constructions of FIGS. 4 and 7 avoid the use of welding, and thus avoid the scrap losses that are present in the FIG. 8 prior art arrangements. Additionally, the FIG. 4, 7 structures do not have the internal flow obstruction that is contained in the FIG. 8 structure. The FIG. 4, 7 collar would ordinarily be constructed of rather thin sheet metal, on the order of about 0.04 inch thick, so that the edge of wall 38 would not present any substantial obstruction to the flow.

FIG. 9

FIG. 9 illustrates another welded construction of the prior art wherein the lower edge of the collar engages the upper outer surface 48a of the hood. The upper edge of the hood necessarily extends radially inwardly beyond the inner surface of the collar to provide sufficient surface for the weld joint. The inward projection of the hood is undesirable in that it forms a shelf or ledge that tends to trap rain or condensate produced during the combustion process. Water or acidic condensate trapped on the ledge may tend to corrode the collar until eventually a hole is formed through the collar wall.

The ledge may also present an obstruction to movement of the butterly damper 50 that is sometimes mounted within the collar. As shown in FIG. 9, the damper has a diameter that is somewhat less than the diameter of the collar in order that the damper can clear the obstruction during its movement between the open position 50*a* and the closed position 50*b*. In the closed position an undesired peripheral gap 52 is formed between the amper and the collar. The arrangement of FIGS. 4 and 7 is devoid of the obstruction present in the FIG. 9 arrangement, such as to permit better assurance of free damper movement and complete seal in the closed position.

The structural features encompassing the features of this invention are set out in the attached claims.

I claim:

1. A fireplace comprising a base pan, an upwardly tapering sheet metal hood positioned on said pan and having an inverted frustro-conical upper end, and a cylindrical sheet metal smoke pipe collar connected to the upper end of said hood; the lower peripheral edge area of said collar including a first annular wall extending outwardly and downwardly at an acute angle to the main collar side wall surface, a second annular wall extending from the outer edge of the first wall inwardly and upwardly along the first wall's inner surface to provide a closed moisture-resistant joint, a third annular wall extending from the inner edge of the second wall downwardly for a distance corresponding to the wall thickness of the hood, and a fourth annular wall extending from the third wall outwardly and downwardly parallel to the second wall to cooperate therewith in forming an annular groove; said hood having its upper end extending into the annular groove; said second and third walls having sufficient facial contact with the hood wall to form a smoke seal; the aforementioned acute angle being sufficient to prevent pull out of the collar from the hood.

2. A fireplace comprising a base, an upwardly tapering sheet material hood positioned on said base and having a convergent upper end, and a sheet material smoke pipe collar connected to the upper end of said hood; the lower peripheral edge area of said collar including a first annular wall extending outwardly and downwardly at an acute angle to the main collar side wall surface, a second annular wall double back along the under surface of the first wall to cooperate therewith in forming a bead, a third annular wall extending from the inner edge of the second wall downwardly for a distance corresponding to the wall thickness of the hood, and a fourth annular wall extending from the third wall outwardly and downwardly parallel to the second wall to cooperate therewith in forming an annular groove; said hood having its upper end extending into the annular groove to cooperate therewith in forming a smoke seal.

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