Dec. 26, 1967 R. WALDHOFER 3,360,247

COUNTERCURRENT WASHER

Filed April 9, 1965 2 Sheets-Sheet 1

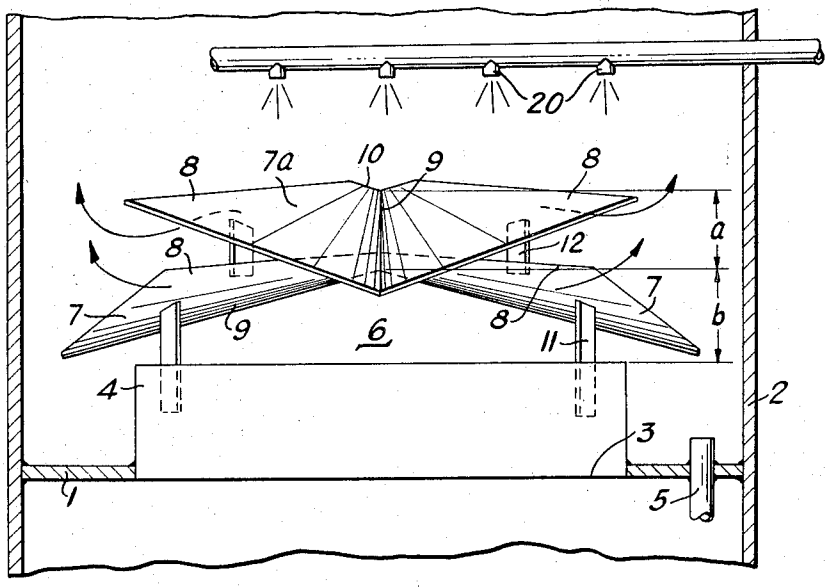


FIG. 1

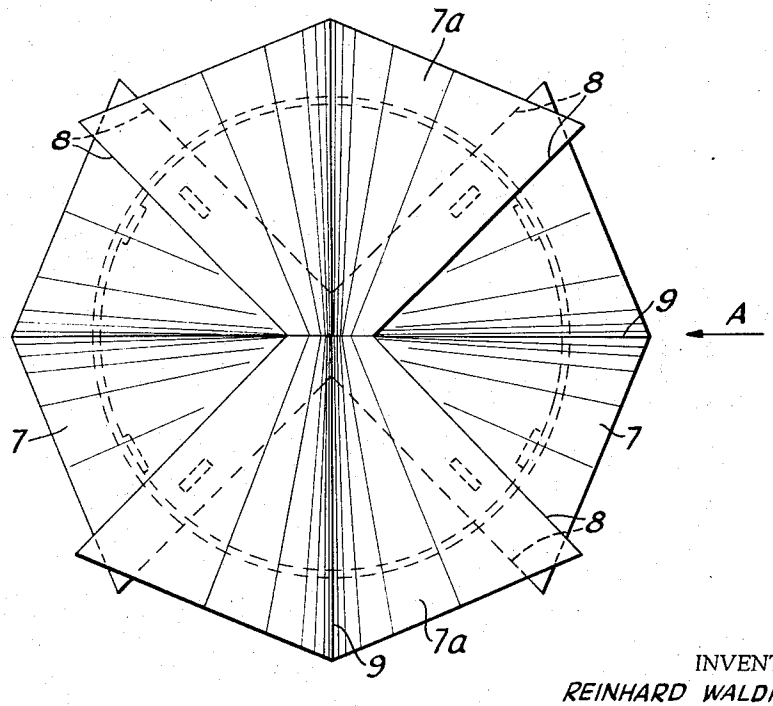


FIG. 2

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COUNTERCURRENT WASHER

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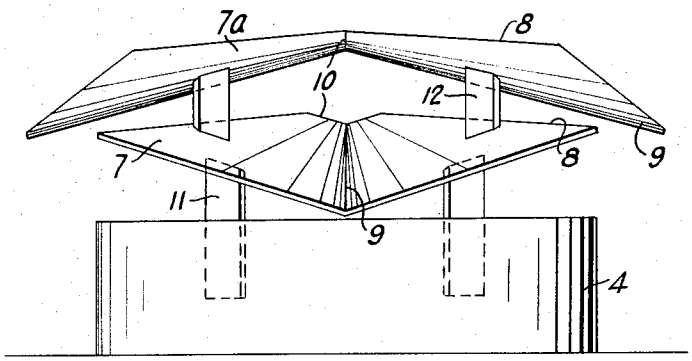


FIG. 3

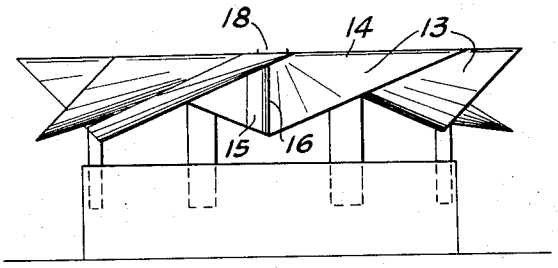


FIG. 4

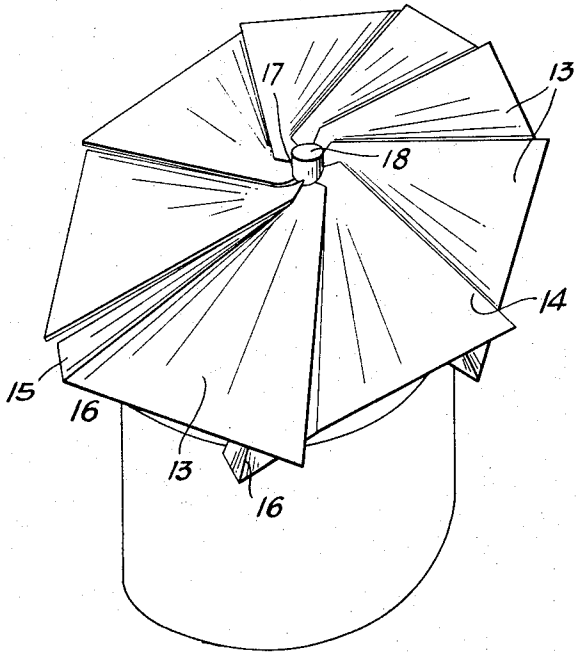


FIG. 5

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3,360,247

COUNTERCURRENT WASHER

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Claims priority, application Germany, Apr. 16, 1964, K 52,691
2 Claims. (Cl. 261—111)

ABSTRACT OF THE DISCLOSURE

A countercurrent washer for a gas cleaning tower includes spaced apart trough-shaped sectors arranged at two different levels in the tower. The sectors at each level slope downwardly and outwardly toward the outer wall of the tower, and the spaced apart sectors at one level cover the sector-spaces between the sectors at the other level. Water, which falls on the sectors, drains toward the outer wall of the tower and onto a collector tray disposed beneath the sectors at the lower level.

The invention relates to a multistage countercurrent washer subdivided by trays, which are provided with passageways covered by conical hoods.

The customary hoods of the passageways of trays of washers offer a considerable resistance to the ascending gas to be sprayed with the washing liquid. The loss of pressure of the gas is additionally increased by superimposed washing stages. The gas is diverted downwardly by the conical construction of the hood. It is possible to reduce the resistance by increasing the distance of the hood from the opening of the passageway. However, this is disadvantageous insofar as concerns the height of the stages of the washer, which in turn signifies an increase of the structural height of the entire washer.

The invention comprises forming the covering hoods of trough-shaped sectors which overlap with a clearance.

By such construction of the covering hood, a larger cross section of the opening is obtained with a lower structural height than with the customary conical covering hoods. A downward diversion of the gas is prevented by upwardly directed outlet slits, so that the loss of pressure is reduced in conjunction with the larger cross section of the opening. The structural height of the individual washing stages and consequently the entire washer is reduced.

According to another aspect of the invention the sides of the channel-shaped sectors have a similar construction and angular position. Furthermore, the sectors are connected together in opposed relation in pairs at the apex and two sector pairs are staggered at 90° one over the other.

A large number of outlet passages are formed in this manner by similar construction of the sectors.

The invention is illustrated by way of example in the drawings.

FIGURE 1 is a vertical section through a part of the washer showing the opening of the gas passageway and the covering hood;

FIGURE 2 is a top plan view of the covering hood;

FIGURE 3 is a view of the covering hood in the direction of arrow A of FIGURE 2;

FIGURE 4 is aside view of the covering hood of another embodiment; and

FIGURE 5 is a perspective view of the covering hood corresponding to FIGURE 4.

The tray **1** of a section of a washing tower **2** is provided with an opening **3** for the passage of gas from below. A cylindrical nipple **4** extends upwardly from opening **3**. Tray **1** is also provided with an opening **5** for passage of the washing liquid to the next washing stage. The washing liquid is supplied through spray nozzles **20** arranged at the top, above the sectors **7**, **7***a* described hereinafter.

The opening **3** of the passageway of nipple **4** connected thereto is covered by a hood **6** to prevent the washing liquid from going through the opening **3** of the passageway. The hood **6** consists of sectors **7**, **7***a*, which have upwardly directed sides **8** and a lower trough **9** formed by abutting sides. The opposed sectors **7**, **7***a* are welded together at the apex **10** and are arranged slopingly downward. The interconnected sector pairs **7**, **7***a* are staggered 90° and arranged one above the other so that their sides **8** overlap. The pairs of sectors are supported on the nipple **4** extending above the passageway **3** by supports **11**, and the pair of sectors **7***a* is supported upon the pair of sectors **7**, by supports **12**.

Passageways are formed in this way between the overlapping portion of the sectors. These passageways are directed upwardly as a result of the upwardly directed sides of the sectors so that the gas is subject to a comparatively slight resistance.

In the embodiment illustrated in FIGURES 4 and 5, a large number of sectors of similar construction and arrangement are provided. The sectors are arranged in a fan-like, downwardly conical pattern. The upwardly directed side **14** forms a trough **16** in conjunction with a shorter, also upwardly directed side **15**. The upwardly directed side **14** overlaps the trough **16** of a preceding sector **13**. The apex **17** of each setcor **13** is welded to a preferably cylindrical member **18**.

I claim:

1. A countercurrent gas washer comprising:

(a) a first vertical conduit wherein there is a flow of gas in an axial upward direction;

(b) a transverse diaphragm in said conduit having therein an axial aperture;

(c) a second vertical conduit disposed in said aperture;

(d) a plurality of sectors arranged radially about a central axial point in said first vertical conduit, each said sector including

(i) first and second edge abutting portions that form a trough, said first portion being larger in area than said second portion with

(ii) the first portion of one sector overlapping in spaced apart relation the second portion of an adjacent sector;

(e) means to introduce washing liquid into said first conduit at a level above said sectors whereby said washing liquid contacts said gases flowing via said passages and impinges upon said sectors and is directed outwardly and downwardly via said troughs onto said diaphragm; and

(f) means to conduct said moisture through said diaphragm.

2. A countercurrent gas washer comprising:

(a) a first vertical conduit wherein there is a flow of gas in an axial upwardly direction;

(b) a transverse diaphragm in said conduit having therein an axial aperture and another spaced apart aperture;

(c) a second vertical conduit disposed in said first axial aperture;

(d) a first diametrically opposed pair of sectors disposed in spaced apart relation to the upward discharge end of said second conduit, said first sectors each comprising upwardly sloping edge abutting side

members forming a downwardly sloping trough, said first pair of sectors being interconnected at an apex on the axis of said first conduit;

(e) a second diametrically opposed pair of sectors disposed in spaced apart relation and oriented 90° with respect to said first pair of sectors, said second sectors each comprising upwardly sloping edge abutting side members forming a downwardly sloping trough, said second pair of sectors being interconnected at an apex on the axis of said first conduit;

(f) said second pair of sectors being disposed in partial overlapping relation to said first pair of sectors and forming downwardly and outwardly directed gaseous flow passages, whereby when washing liquid is introduced into said first conduit above said sectors, said washing liquid contacts said gases flowing via said passages and impinges on said sectors and is directed

outwardly and downwardly via said troughs onto said diaphragm and through said diaphragm via said other aperture; and

(g) means to introduce said washing liquid into said first vertical conduit at a level above said sectors.

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