# United States Patent

[11] 3,618,908


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[21] Appl. No. **831,889**
[22] Filed **June 10, 1969**
[45] Patented **Nov. 9, 1971**
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[54] **GAS SCRUBBERS**
**4 Claims, 2 Drawing Figs.**


[52] **U.S. Cl.** ..... **261/62,**
261/112, 261/116, 261/118, 261/DIG. 54
[51] **Int. Cl.** ..... **B01d 47/00,**
B01d 47/06
[50] **Field of Search** ..... 261/DIG.
54, 108–112, 116, 118, 62



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**ABSTRACT:** Gas to be scrubbed is fed under pressure down the upright arm of a generally elbow-shaped conduit and is intercepted by a curtain of water spray prior to its entrance into the horizontal arm. Water overflowing a circumferential weir drains down the walls of the upright arm. An adjustable damper controls the area of the passage immediately behind the water curtain.

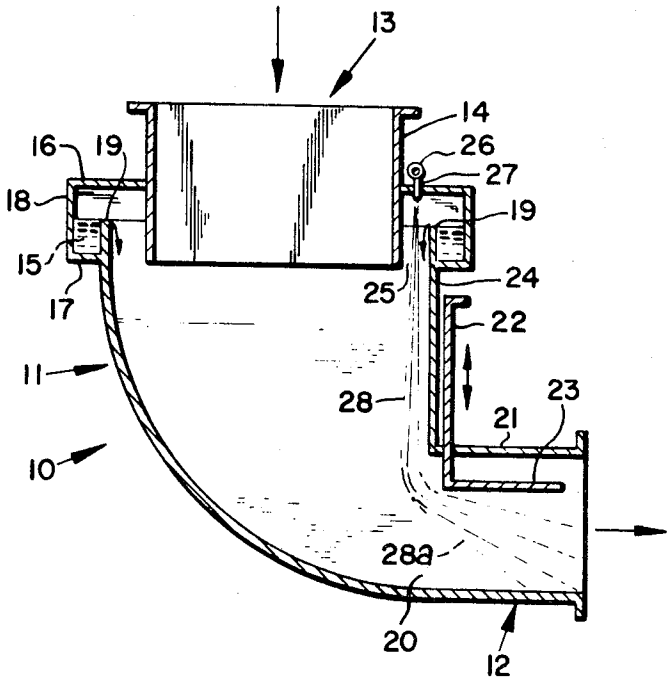



FIG.1

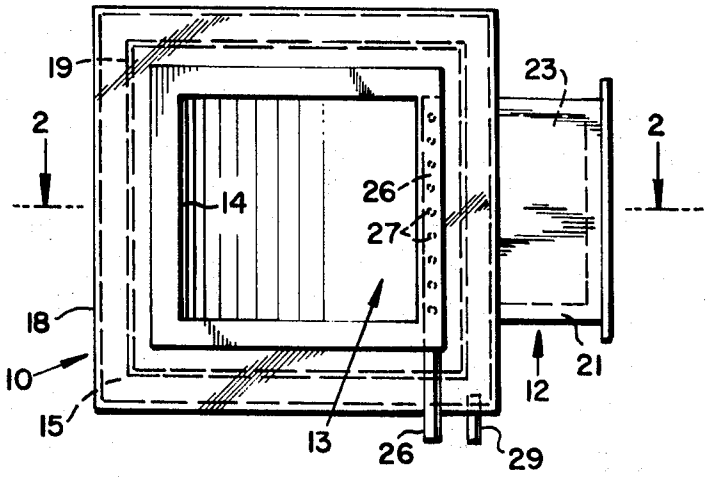
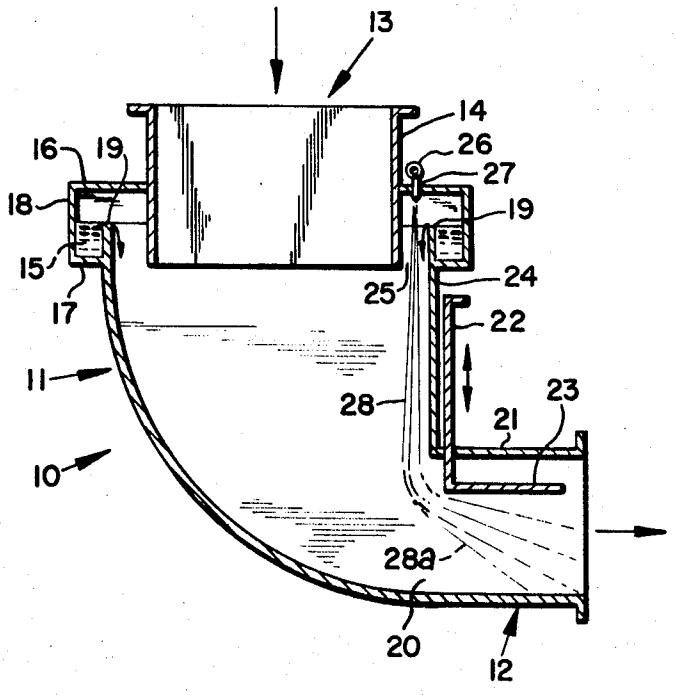



FIG.2




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# GAS SCRUBBERS

The main object of the present invention is the provision of a simple yet inexpensive and highly efficient structure for removing particulate matter from gas streams.

Referring briefly to the drawing, FIG. 1 is a top plan view of a gas scrubber embodying features of the present invention.

FIG. 2 is a sectional view taken on the line 2—2 of FIG. 1.

Referring in detail to the drawing, the numeral 10 designates the device as a whole which, broadly speaking, may be termed a conduit having the general conformation of an elbow which includes an upright arm 11 and a substantially horizontal arm 12.

The upper or gas inlet end 13 is shown reduced by a neck 14, and an external circumferential trough 15 is provided between a roof 16, a floor 17, the vertical wall 18 and the portion 19 of the wall of the arm 11 which extends part way upward above the floor 17 and constitutes a weir. The floor 17 has a smaller width than the roof 16 and thus leaves a circumferential clear passage between the neck 14 and the weir, designated by the numeral 25.

The cross-sectional area of the arm 11 diminishes in a downward direction so that the entrance into the arm 12, designated generally by the numeral 20, is thus reduced as is also the cross-sectional area of the arm 12. Thus gas descending the arm 11 under pressure has its speed of travel increased in entering into the arm 12.

The top wall 21 of the arm 12 has slidably mounted in a slot therein a damper 22 provided within the arm 12 with a substantially horizontal baffle 23. The damper is positioned close to the outside of the side wall 24 of the arm 11.

Supported on the roof 16 directly above the space or passage 25 between the neck 14 and the wall 24, is a pipe 26 having a plurality of spray or jet stream nozzles 27 to direct a curtain of water 28 downward across the entrance 20. Another water inlet pipe is shown at 29 to feed water at a relatively slow rate into the trough 15, which water passes over the weir 19 and drains down to the inner walls of the arm 11 to maintain the latter wet.

As gas enters the inlet 13 and passes down the arm 11 into the arm 12, it is intercepted by the water curtain through which it must pass. The pressure of the incoming gas causes the curtain 28 to be deflected and further atomized, as indicated at 28*a*, as the gas passes through it. Through this action particulate matter contained the gas is washed out and the gas passes through the arm 12 cleansed of such matter. The damper may be moved up or down to accommodate for pressure variation. A drain, not shown, is as usual provided at the end of the arm 12 or close thereto, for runoff of the water containing the washed out matter. The scrubbed gas passing from the arm 12 is fed into a mist separator, not shown, such being well known in the art.



Basically the device functions without the water flowing over the weir and without the damper 22. The latter two, however, add to the effectiveness of the scrubbing operation.

Although the conduit 10 is shown rectangular in cross section, it may obviously have a cross section other than rectangular. Further, although the device has been described as functioning in the upright position shown in the drawing, it may obviously be use in a position at an angle thereto by omitting the weir.

What is claimed is as follows:

1. A device for scrubbing gas comprising an elbow-shaped conduit including an upright arm having the inlet thereinto at its upper end and a substantially horizontal arm having the outlet thereof at its outer end, the gas to be scrubbed being adapted to flow under pressure into the device through said inlet, means for spraying a curtain of water downward across the entrance to said horizontal arm whence the gas must pass through said curtain to exit from said outlet, the cross-sectional area of said upright arm diminishing in a downward direction to a minimum at said entrance.

2. A device according to claim 1, having adjustable damper means mounted in said entrance operable for varying the cross-sectional area of said entrance.

3. A device according to claim 1, having an outwardly offset circumferential trough positioned near said upper end of said upright arm, the inner wall of said trough comprising a weir aligned with said upper end of said upright arm, a roof over said trough sealing the same against outside air, and means for providing a flow of water over said weir and down the inner surface of said upright arm.

4. A device according to claim 1, having damper means mounted in said entrance and having means for providing a flow of water down the inner surface of said upright arm.

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