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Ger. Pat. No. 388,857 dated January 21, 1924  
to Edward Theisen in Munich  
entitled  
Multistage Gas-Scrubbing

A process is known which is suitable for the treating of gases, air, vapors, etc. for the purpose of purification, cooling, mixing, absorption, etc. The air or gas flow is subdivided into several portions and is subjected to a treatment in each compartment by means of a flow of liquid which travels from the center to the periphery. The treatment takes place along cone surfaces or by passing through screens of the liquid. The gas travels in a counter-current flow to the liquid. The device consists of several concentrically arranged cone surfaces with distances between them and forming a cylinder-like body which are enveloped by two or more concentric arranged cone surfaces one of the other separated by an interspace and forming a cylinder.

The invention intends to improve the described device in order to intensify the reciprocating action between air, gases, vapors on the one hand and the liquid on the other. For that reason the formation of a screen of the liquid is improved through which the flow of air, gases, vapors is passed. The connection and fastening of the cones is performed in an equally simple manner as before. It is carried out in such a manner that a disc-like lug is fixed to the basic or opposite circle of the single cones. The disc shaped lug of the outmost cone can be used to fasten one or several centrifuge blades which are arranged at the periphery of the outmost row of cones in the usual manner. At the stationary wall of the casing and at the rotating support of the cone surfaces additional cone surfaces can be attached, which together with the rotating cone surfaces, prevent a portion of the gas from escaping the treatment by the liquid by traveling along the wall of the casing and along the support.

According to picture 1 the device consists of several cones "a, a<sub>1</sub> ....." set concentrically one into the other forming a cylinder and rotating in the same direction. They are enveloped by an equal set of cones "b, b<sub>1</sub> ....." which travel in the opposite direction. The path of the gases is indicated by the straight lines arrows, whereas the dotted arrows represent the travel of the liquid. The cones "a, a<sub>1</sub> ....." are fastened by bolts as well as the cones "b, b<sub>1</sub> ....." whereby the distances provided for must be carefully maintained.

The base of the cones is equipped with a lug "d" which facilitates the fastening of the cones and favors the formation of a disc shaped liquid screen. As shown in the picture the scrubbing liquid travels from the center to the periphery whereas the gas is introduced at the periphery and leaves at the center. A counter-current flow treatment is secured. As indicated by the pictures 2 and 3 two or more cones can be combined to one piece. It is even possible to connect all cones thus obtaining one single piece securing the most uniform stress of the material. The pictures 5 and 6 represent a complete scrubber according to the described process.

The upper right corner of picture 5 shows a section of the device in compliance with picture 1. "f" is a spray-cone, which secures a uniform distribution of the scrubbing liquid, "g" designates an impeller of a fan in order to supply the necessary pressure; "h" is a closed drum which carries the bolts on which the single cones are strung. The stationary wall of the casing is equipped with cone surfaces "a<sub>3</sub>" which

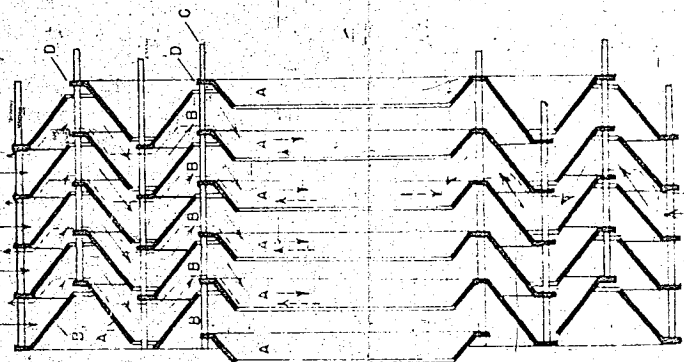
together with the nearest rotating cone surfaces prevent one portion of the gas from escaping untreated passing along the wall of the casing.

Picture 7 shows a complete one sided gas scrubber. The cones which are arranged on bolts are fixed to a disc "i", whereas the fan "k" is connected with a disc "l". It should be mentioned that the cones which are situated at the periphery are equipped with washing blades "m" which direct the gas-liquid-mixture along the wall of the casing.

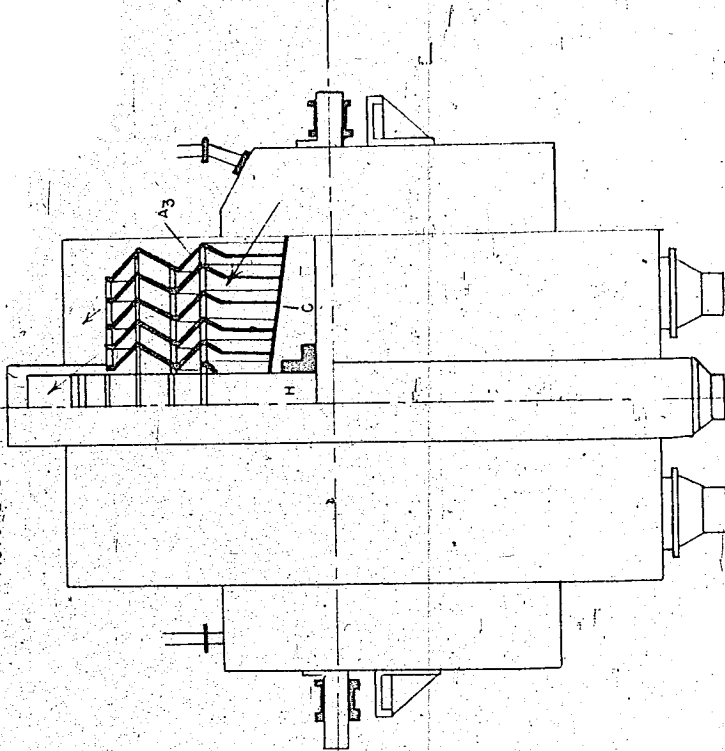
Gas scrubbers of such type can be employed for many commercial purposes especially in the chemical industry. They can be applied for scrubbing, absorption, etc. of acid containing gases and vapors. Acids can be used because the cones can be easily made of lead, glass, porcelain, stone, wall, etc. It is also possible to disperse the liquid disc which is formed by the rotating cones by stationary rods, perforated sheet metal cylinders, forcing the gas to pass through a mist of the liquid. The mist is deposited on the cones of the following row and centrifuged by passing along the cone surface.

The pictures 8 and 9 represent a longitudinal- and cross-section of such an apparatus. The cone surfaces "b", or the disc like lugs of the outmost cones are designed in such a manner that the blades "m" can be easily attached to them.

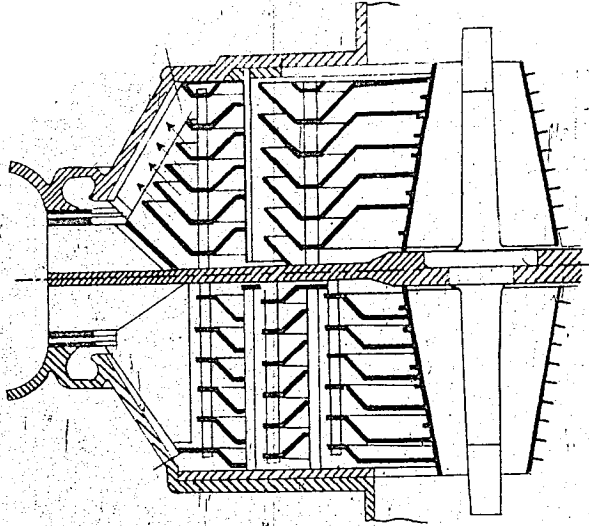
PICTURE 1



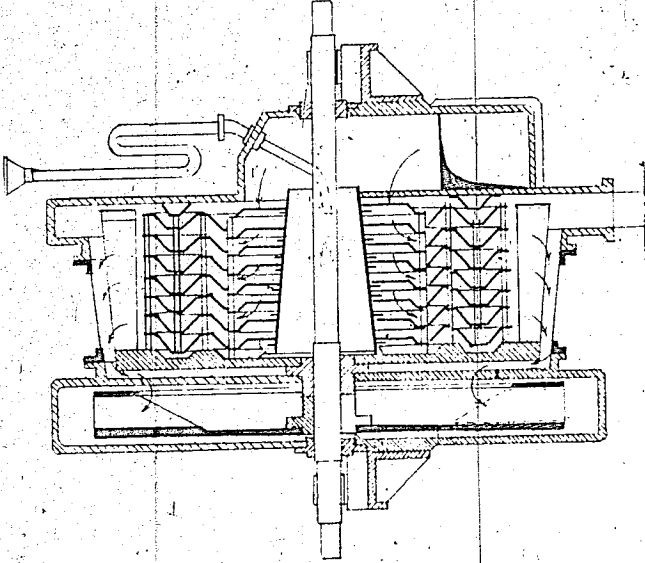
PICTURE 5



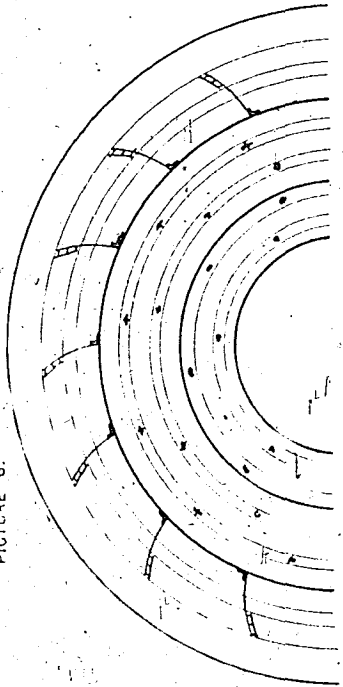
PICTURE 8



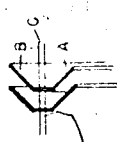
PICTURE 7



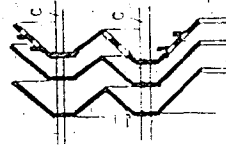
PICTURE 6



PICTURE 2



PICTURE 4



PICTURE 3



PICTURE 9

