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REMOVAL OF HYDROGEN SULPHIDE FROM GASES

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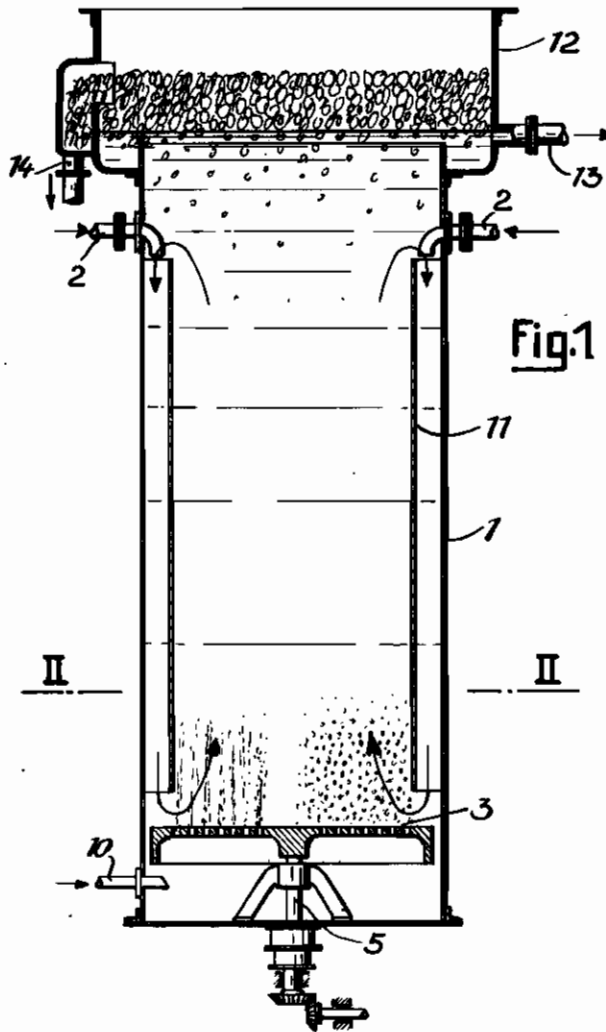


Fig. 1

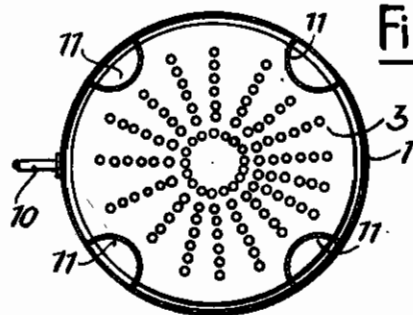


Fig. 2

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REMOVAL OF HYDROGEN SULPHIDE FROM GASES

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This invention relates to the removal of hydrogen sulphide from coal distillation gases or the like and more particularly to the treatment of spent washing liquors with finely divided gases, such liquors being produced during the removal of hydrogen sulphide and other impurities from gases if the gas to be cleaned is brought into contact with a liquor containing compounds, absorbing sulphur, whereby the sulphur especially in elementary form is separated by treating the liquor with air or other oxidizing gases and the substances for absorbing the sulphides are reformed.

The present invention refers in particular to the activation of the spent washing liquors of the so-called Thylox - gas - purification - process in which the gas to be cleaned is treated with an alkaline solution of sulphur oxygen compounds of a metal belonging to the tin-group of the qualitative analysis, for instance with compounds containing arsenic, sulphur and oxygen. In this process the spent washing liquor is usually regenerated by a treatment with air in a tower-like vessel which is called thionizer. By means of the oxygen, the elementary sulphur is set free from the sulphur arsenic oxygen compound and the lower sulphurized arsenic oxygen compound, effective for the absorption of hydrogen sulphide is reformed. The elementary sulphur collects as a slurry or foam on the surface of the liquor in the thionizer and is separately recovered from the liquor.

In Letters Patent 2,141,047 granted to Koppers Company an improved contrivance for the activation of spent washing liquors is shown, a characteristic feature of said contrivance being to provide in the thionizer return channels, leading from the top of the liquor column down to the bottom of the thionizer in such a way that a flow-back of the washing liquor from the top of the thionizer to its lower part is rendered possible. By such a flow-back the undesired formation of large gas bubbles is decreased and the efficiency of the thionizer is improved correspondingly. Further the separation of elementary sulphur is considerably better if a larger quantity of finely distributed sulphur is present in the liquor and by a partial leading back of the liquor highly enriched with sulphur from the top of the thionizer into the lower part thereof, the concentration of elementary sulphur in the treating liquor is increased near the bottom of the thionizer, i. e. in that zone in which the fresh oxidizing gases have first come into contact with the liquor.

The inventor, however, has found that it is

very difficult to distribute the spent washing liquor introduced freshly into the thionizer evenly within the ascending circulation current of liquor in said thionizer and it is the main object of the present invention to provide for such improvements that a uniform distillation of the spent washing liquor within the charge of the thionizer is arrived at and thus the oxidation of the liquor is considerably improved.

According to the invention the spent washing liquor leaving the gas scrubber is introduced into the thionizer at one or several places situated near the upper end of the said return channels of the thionizer or inside said channels in such a manner that the spent liquor flows firstly downwards with the returning liquor already treated in the thionizer, said mixture being highly enriched with elementary sulphur and it may be easily oxidised in a uniform manner and the utilisation of air is uniform all over the cross section of the thionizer, the formation of larger gas bubbles within the liquid column being considerably reduced.

The addition of the spent liquor to the scrubbing solution flowing downwards the scrubber has also the advantage that the circulation is assisted in the thionizer because the specific gravity of the liquid flowing off the scrubber considerably differs from that of the solution in the thionizer which latter solution has absorbed air to a high degree. By the method according to the instant invention the circulation of the scrubbing solution is thus assisted without any additional means being required.

With the above and other objects and features of my present invention in view, I shall now describe a preferred embodiment thereof on the lines of the accompanying drawing in which

Fig. 1 shows a thionizer in a vertical section and

Fig. 2 shows a horizontal cross section on line II—II.

The thionizer shown on the drawing comprises essentially a cylindrical container 1 in the bottom of which a perforated plate 3 or other means are provided for, serving for the distribution of air or other oxidizing gases.

Below the plate 3 a compressed air pipe 10 is connected to the thionizer. The air introduced through pipe 10 into the tower enters the thionizer through the holes of the plate 3.

When in operation the plate may rotate round axis 5 for example at 200 revolutions per minute. The air forms thin jets if leaving the plate being at a standstill as shown on the left hand side

of Fig. 1. But a distribution of the air in individual fine bubbles is arrived at when the plate is rotating as to be seen on the right hand side of Fig. 1.

Furthermore means are provided in the thionizer in order to enable a return of the liquid from the upper part to the bottom of the tower in opposite directions to the ascensional movement of the liquid caused by the oxydation gases. For this purpose for instance a double jacket or a semi-circular sheet plate body 11 is fastened to the thionizer at its inner circumference so that pipe like hollow spaces are formed at the walls of the thionizer. Through these hollow spaces part of the liquid continuously flows from the upper part of the tower to the bottom.

At the upper end of the thionizer an overflow tank 12 is provided for in which the sulphur foam

separating from the liquid settles down. The regenerated solution flows off through branch 13 while the sulphur foam may be discharged through pipe 14.

5 The spent liquor to be regenerated is introduced through pipes 2 from above into the return channels 11 so that the freshly added solution mixes intimately with the scrubbing solution being already in circulation and may enter
10 the lower part of the thionizer interior from the lower end of the return channels 11. This method warrants a homogenous composition of the liquid to be regenerated when it comes into contact with oxidising air.

15 It is also possible to introduce the spent liquor flowing off the scrubber at another point into the return means.

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