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METHOD OF REGENERATING SULPHUROUS ACID AND THE HEAT OF THE WASTE GAS FROM CELLULOSE BOILERS

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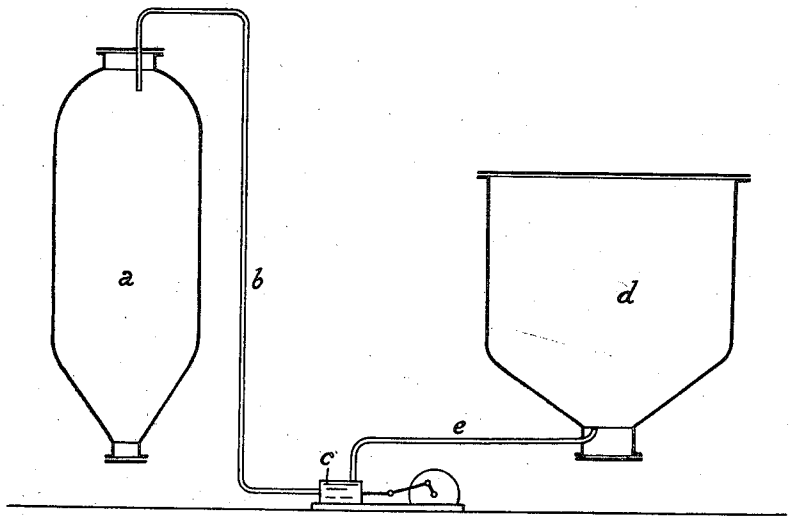

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METHOD OF REGENERATING SULPHUROUS ACID AND THE HEAT OF THE WASTE GAS FROM CELLULOSE BOILERS.

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To all whom it may concern:

Be it known that I, HANS CLEMM, a citizen of Germany, residing at Mannheim-Waldhof, in the State of Baden, Germany, have invented certain new and useful Improvements in Methods of Regenerating Sulphurous Acid and the Heat of the Waste Gas from Cellulose Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in the method of and system for regenerating sulphurous acid and the heat of the waste gas from cellulose boilers. In the manufacture of sulfit cellulose various methods have been designed to regenerate the sulphurous acid remaining after boiling within the boilers and the heat of the waste gas. Ordinarily for removing the said gas from the boiler only the pressure within the boiler is made use of. For example, where it is intended to use the waste gas for supplying the sulphurous acid (SO_2) to a fresh charge of boiling liquor the discharge from the boiler is connected by a pipe including cooling means with the receptacle containing the fresh liquor, so that when opening the discharge valve the gas from the boiler, which is under a pressure of several atmospheres, flows into the said receptacle after being cooled, whereupon it is absorbed by the liquor. Where the fresh liquor is contained within a closed receptacle the gas can be transmitted into the same without cooling, so that also the heat is regenerated.

However, in both cases the regeneration of the sulphurous acid and the heat is incomplete, the gas chamber of the boiler remaining filled with gas after discharging the same in the manner indicated, especially as the pressure within the boiler does not fall off to atmospheric pressure, by reason of the high level of the fresh liquor and the pressure produced in some cases within the receptacle containing the fresh liquor.

It has also been proposed to withdraw the gas from the boiler by means of a suction pump and to pass the same through condensers, absorption apparatus, and the like. But in such cases also the regeneration of the sulphurous acid is incomplete, because the suction pump connected to the system is just sufficient to overcome the resistances within the system, and it is not enabled to produce a vacuum within the gas chamber of the boiler. Furthermore it is impossible by this method directly to transmit the sulphurous acid of the waste gas to the fresh liquor, or directly to pass the same into the fresh liquor for regenerating the heat thereof. By withdrawing the gas by suction the proportion of sulphurous acid within the fresh liquor would not be raised but reduced.

The object of the improvements is to provide a method and a system whereby the sulphurous acid is completely regenerated and in addition the heat of the waste gas is made use of. With this object in view the gas is directly withdrawn from the boiler by means of a compressor and passed under pressure for further use to any desired apparatus. By the suction of the compressor the pressure within the boiler is reduced below atmospheric pressure, so that a vacuum is produced within the boiler and above the liquor. Thereby not only the sulphurous acid contained in the gas chamber is withdrawn, but, by reason of the vacuum, also the major part of the sulphurous acid contained in the liquor is withdrawn and regenerated. By conveying the waste gas to the place of use under pressure, the gas whether hot or cold can be forced into the fresh liquor, irrespective of the level thereof, which liquor is enclosed for example within a closed receptacle.

In order that my invention be more clearly understood a system suitable for putting the method into effect has been shown by way of example in the accompanying drawing showing the system in a diagrammatical way.

In the example shown in the drawing the waste gas is withdrawn from the boiler *a* at the top thereof through a pipe *b* and by means of a compressor *c*. By the said compressor the gas is conveyed under pressure through a pipe *e* and into a receptacle *d* containing the fresh liquor, the gas being taken up by the fresh liquor. In lieu of the re-

ceptacle *d* other apparatus such as boilers, condensing apparatus, or absorbing apparatus may be provided.

I claim:

1. The herein-described method of regenerating sulphurous acid and heat from waste gas contained in cellulose boilers which consists in withdrawing the mixture of vapor and gas therefrom to a degree to produce a partial vacuum in the boiler, and in conveying the vapor and gas to a place of use, whereby not only the sulphurous acid contained in the gas chamber of the boiler is withdrawn but also the major part of the sulphurous acid contained in the liquor in the boiler is withdrawn and regenerated.

2. The herein-described method of regenerating sulphurous acid and heat from waste gas contained in cellulose boilers which consists in withdrawing the mixture of vapor and gas therefrom to a degree to produce a partial vacuum in the boiler, and in conveying the vapor and gas to a place of use, whereby not only the sulphurous acid in the gas chamber of the boiler is withdrawn but also the major part of the sulphurous acid contained in the liquor in the boiler is withdrawn and regenerated, said place of use consisting of a closed chamber containing fresh liquor.

3. The method herein described of regenerating sulphurous acid and heat from waste gas contained in cellulose boilers which consists in withdrawing the vapor and gas therefrom to a degree to produce a partial vacuum in the boiler and in conveying the vapor and gas under pressure to a closed chamber, this chamber containing fresh liquor, whereby not only the sulphurous acid in the gas chamber of the boiler is withdrawn, but also the major part of the sulphurous acid contained in the liquor in the boiler is withdrawn and regenerated.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

DR. HANS CLEMM.

Witnesses:
C. C. L. B. WYLES,
H. SCHICKERT.