

HASTERT Edouard

(1872 - 1936)

Luxembourg-city

Patents (details)

1a - Improvements in apparatus for cooling and purifying gases

GB patent	1906/18014
Application date	10 August 1906
Co-inventor	Aloys MEYER

Hitherto, for the purpose of cooling blast furnace gases for their employment as heating or motive-power gases, two types of cooling apparatus have generally been utilised. The apparatus most generally employed are cooling or washing towers with hurdles or gratings, in which the gas to be cooled passes upwards through a vertical cylindrical vessel, whilst a finely divided stream of water circulates in the apparatus in the opposite direction, and absorbs a large part of the heat of the gas.

A second type of cooling apparatus consists broadly of a cylindrical vessel in which there rotates a shaft, carrying a number of circular sieves. The vessel is filled with water in such a manner that the rotary sieves enter the water almost up to the axis of rotation and thus become re-charged with water at each revolution. The gas traverses the vessel in the longitudinal direction above the level of the water, and is obliged to pass through the close meshes of the sieves charged with water, in such a manner that intimate contact and consequently an active exchange of heat takes place between the gas and the drops of water upon the surface of the sieve. The water passes through the apparatus in the opposite direction to the stream of gas, this being obtained by means of suitable partitions. Simultaneously a part of the dust contained in the gas is separated and deposited upon the meshes of the sieves. When the sieves enter the water, this dust should be removed. Experience has demonstrated however that this only takes place if the water is pure; after a certain time, the water is so charged with particles of dust that it is no longer suited for washing the sieves. A viscous and muddy mass is formed upon the surface of the water, and this cannot be discharged through the openings provided for this purpose, which are formed in the bottom of the vessel, and it is likewise unable to escape with the water flowing off, this escape being prevented by the partitions already referred to. This muddy mass becomes deposited upon the sieves and blocks the openings.

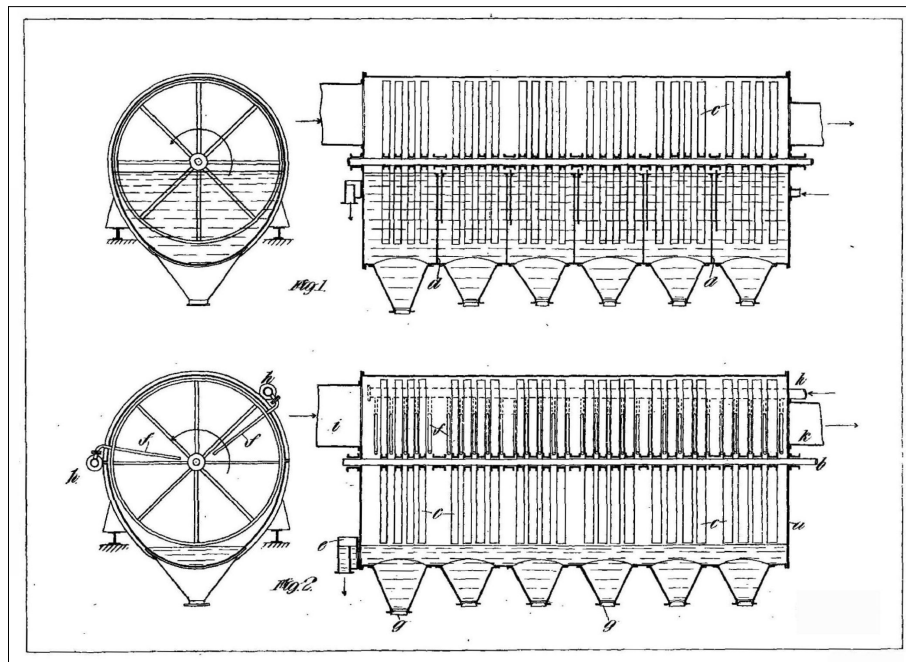
The efficiency of the apparatus decreases therefore in such a manner that frequently after a few weeks it is necessary to stop the apparatus in order to clean it. This cleaning is a long and tedious operation.

The present invention has for its object to obviate these defects. In the improved apparatus the partitions are entirely dispensed with in such a manner that the light mud floating upon the surface of the water is better able to flow through the opening, for the discharge of the water. Idle level of the water is lowered in such a manner that the sieves no longer enter it. The spraying of these sieves is effected by pairs of pipes arranged radially as far as the shaft, and which are provided with spraying holes in such a manner that the total surface of the sieves is completely sprayed by fresh water under pressure twice per revolution. In this manner, on the one hand uniform spraying is ensured, and on the other hand, the particles of dust deposited by the gas upon the meshes are constantly carried away by the water, so that obstruction of the sieves is entirely prevented. As compared with known forms of apparatus, this novel apparatus presents the important advantage that the total section is almost doubled, which corresponds to an increase of the output in the same proportion.

As the obstruction of the meshes is impossible, the employment of dismantlable segments for the metal discs becomes superfluous.

*Fig. 1 shows in longitudinal and vertical-cross-section an apparatus as hitherto generally used, with rotary sieves **c** dipping almost up to their axes in water, the partitions **d** forcing the water to pass through the apparatus in a zig-zag way,*

Fig. 2 shows in longitudinal and vertical cross-section an apparatus constructed according to our present invention.



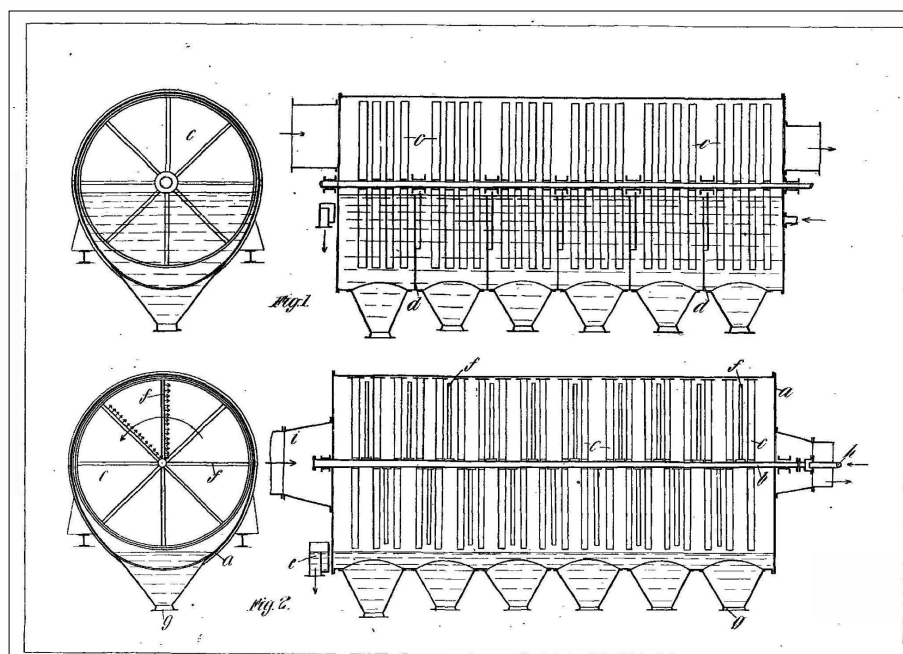
1b - Improvements in apparatus for cooling and purifying gases

GB patent	1906/17999
Application date	10 August 1906
Co-inventor	Aloys MEYER

Claims

1 In gas cooling or washing apparatus, the combination of a substantially cylindrical casing, a horizontal hollow water supplying shaft rotating in the said casing, a series of perforated, branch pipes radially extending from the said shaft and rotating along with it, and a series of perforated discs or sieves arranged between the said branch pipes and firmly secured to the said casing, substantially as described.

2- In apparatus such as claimed in Claim 1, the arrangement of the perforations of the branch pipes in such a manner that the rotation of the shaft and the branches is effected by the reaction of the water which is pressed through the said perforations.



3 - Apparatus for homogenizing powdered mixtures

US patent 2171398
Application date 12 June 1935

Using air under pressure is known for lessening the compacity of a powdered or pulverulent mass, increasing thus the mobility of the solid particles so as to impart to the mass a fluidity like that of a liquid.

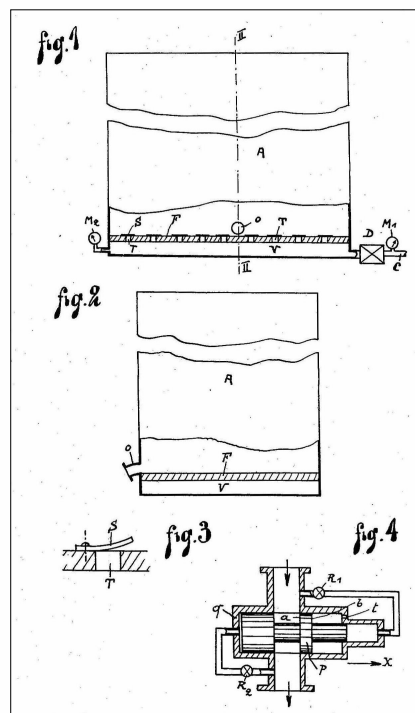
The present invention provides for such an inclusion of air in the mass and concerns essentially the production of pressure waves in the complex medium composed by the gaseous agent and the solid particles so as to homogenise powdered mixtures submitted to such an operation.

The speed of propagation of waves in an elastic medium depends, as is well known, of the nature of this medium. In a complex medium the propagation of waves is not uniform by reason of local variations of the nature of the material, and of refractions and reflexions of the waves at the surfaces of separation of parts of different natures. This, nonuniform propagation produces in the mass a turbulency which renders it after a certain time perfectly homogeneous.

The invention provides that the waves may be produced in the said medium from one, two or more emission centers. Said waves may be obtained by using for maintaining the fluidity of the mass, air in pulsatory state, analogous to the pulsatory motion of sonorous phenomena.

When the waves are obtained by intermittently wholly cutting the air current at its penetration in the mass, the duration of these interruptions ought to be short enough to avoid falling of the mass again, even partially, in the compacity it had before the inclusion of air under pressure.

Practically the frequency of the pulsations may be such that the waves produced in the considered medium, impart in it a vibratory state by which homogenization is produced in a manner similar to the diffusion of two gases one into the other.



4 - Method and apparatus for homogenizing powdered mixtures

US patent 2171399
Application date 9 July 1935
Assigned to Louis PETERS, Düsseldorf

According to this invention the air under pressure used for homogenizing powdered or pulverulent masses has to accomplish two different functions.

First this air produces in the powdered mass transport currents of variable localisation and secondly this air has to drive into these currents powdered mass taken from around it.

The invention thus provides for introducing the amount of air in conditions of delivery, pressure and emplacement such as to produce in the powdered mass distinct currents taking along the whole of their travel material from the surrounding mass, and this with an impulse sufficient for going through the whole width of the mass.

The invention also provides for producing the incorporation of part of the surrounding mass in the transport currents by continually varying the impulse imparted to these currents.

And also the invention provides for varying this impulsion of the air under pressure in the mass to be treated.

Corresponding patents

DE, BE, FR, DK, CH, ES

