International Science Group

ISG-KONF.COM

IX

INTERNATIONAL SCIENTIFIC AND PRACTICAL CONFERENCE "INNOVATIVE TECHNOLOGIES IN SCIENCE AND EDUCATION"

Jerusalem, Israel

March 04 - 06

ISBN 978-1-63732-147-8
DOI 10.46299/ISG.2021.I.IX

INNOVATIVE TECHNOLOGIES IN SCIENCE AND EDUCATION

Abstracts of IX International Scientific and Practical Conference

Jerusalem, Israel
March 04 – 06, 2021

Library of Congress Cataloging-in-Publication Data

UDC 01.1
The IX International Science Conference « Innovative technologies in science and education», March 04 – 06, 2021, Jerusalem, Israel. 332 p.

ISBN - 978-1-63732-147-8
DOI - 10.46299/ISG.2021.I.IX

EDITORIAL BOARD

THE FILTER ON THE BASIS OF THE EJECTOR OF THE HEAT EXCHANGER FOR PURIFICATION OF HARMFUL SUBSTANCES FROM FLUE GASES USING HEAT EXCHANGER AS COMBUSTION GAS FILTER

Bushmanov V.
graduate student

Kohut V.
Associate Professor

Khmelnyuk M.
professor
Odessa National Academy of Food Technologies

The content of nitrogen, and carbon oxides produced by the combustion of solid or liquid fuels in the source flue gases is a serious environmental threat. For example, chemical compounds such as SO2 and SO3, nitrogen oxides NO, carbon monoxide, when combined with water vapor, form acids H2SO3, H2SO4, HNO3, HNO2, H2CO3 which cause harmful effects on human health. , lead to the destruction of forests and fruit trees, reducing crop yields. Flue gas cleaning is still an urgent problem that still needs a solution. Because of our development, we can offer a flue gas-cleaning device for sulfur, nitrogen and carbon oxides.

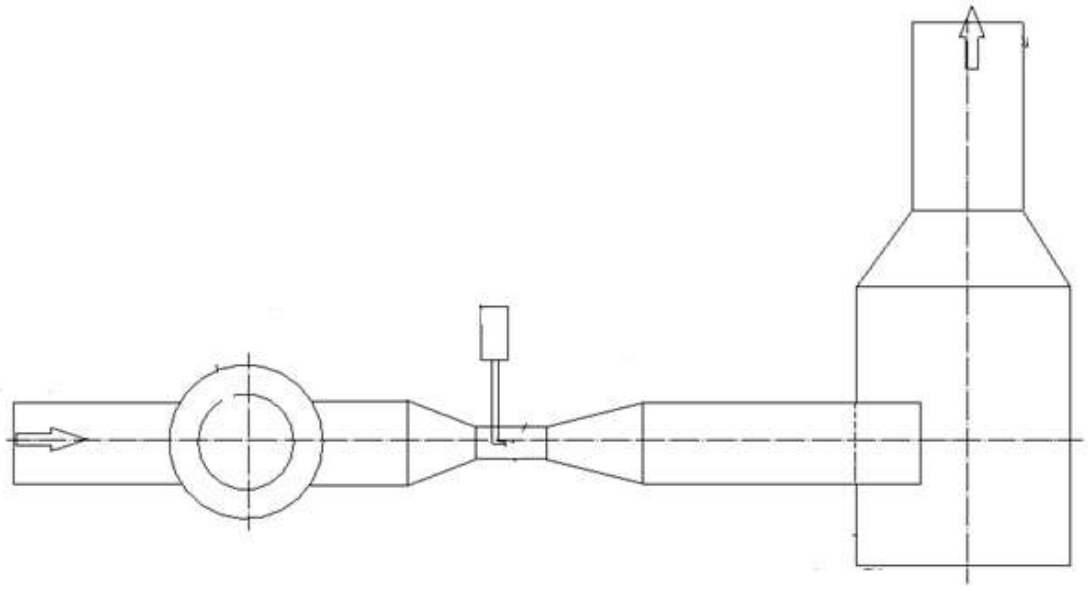

Fig. 1 Device for the purification of flue gases from sulfur, nitrogen and carbon oxides

The claimed device improves the quality of flue gas purification from pollutants and reduces energy costs.Our device can be used not only for cleaning of oxides.

At start-up and transition modes, the amount of emissions and the amount of harmful substances in the composition of flue gases increases by 90%. This is because the starting mode does not reach the correct temperature range and the oxidizer (air or oxygen) may not be properly distributed in the fuel. In addition to pollutants such as nitric oxide, sulfur, and carbon, carcinogens are formed in the combustion products. Several hundred substances known carcinogens, but only a few dozen have been studied in detail. . Upon contact of a flue gas stream containing pollutant oxides, such as SO3, CO2, NO2, with finely dispersed water, a reaction occurs to form acids, the molecules of which condense on the micro particles of dust, forming nuclei.The design of this filter has the following components: a fan for pumping gases, which creates on the one hand excess pressure, and on the other, its disadvantage, which leads to the movement of gas masses, straight pipe sections in front of the filter are needed to stabilize the flow, the filter is structurally a Laval nozzle , and has a tapered pipe, a straight section called a mixing chamber, an expanding pipe. In the mixing chamber there is a nozzle of liquid injection which sprays a coolant into the gas stream. A device for separating the liquid droplets from the gas stream follows the filter. It is a housing with a plug device to allow the droplets of fluid to settle on the walls of the device, and under gravitational action rolled down. The temperature of the onset of the hydration reaction (the release of pollutants from the flue gas) is 400… 500 ° C. Typically, the flue gas intake temperature is 600 to 700 ° C, that is, significantly higher. Therefore, the claimed device provides for the cooling of the flue gas before cleaning at the pre-cooling unit. The flow rate of the liquid refrigerant required to reduce the flue gas temperature from initial to required, depending on the initial temperature and flue gas flow rate, can be determined by the equation:

$$t_{cm} = \frac{Gd * Cpd * td + Gn * Cpn * tn}{Gd * Cpd + Gn * Cpn}$$

tcm - temperature of the mixture "flue gases - liquid coolant", ° C;

Gn - flow rate of liquid coolant, m3 / s;

Cpn is the heat capacity of the liquid coolant, W / (kg • ° C);

tn is the temperature of the liquid coolant, ° C;

Gd - flue gas consumption, m3 / s;

Cpd - flue gas heat capacity, W / (kg • ° C);

td - flue gas temperature, ° C.

This greatly simplifies the setup of the device and increases its energy efficiency.

Using a heat exchanger filter we have created, it is possible to clear flue gases from almost all polluting factors. In the initial boiler operating modes, when the highest amount of carcinogens is released, the filter can be used to condense them.

When the boiler enters the basic operating mode and the carcinogens decompose from high temperature into simple, non-harmful components, oxides become the main problem in the flue gas. Which can also be cleaned with our ejector filter.

INNOVATIVE TECHNOLOGIES IN SCIENCE AND EDUCATION

Scientific publications

Materials of the IX – the International Science Conference «Innovative technologies in science and education», Jerusalem, Israel. 332 p. (March 04 – 06, 2021)

UDC 01.1

ISBN – 978-1-63732-147-8

DOI - 10.46299/ISG.2021.I. IX

The content and reliability of the articles are the responsibility of the authors. When using and borrowing materials reference to the publication is required. Collection of scientific articles published is the scientific and practical publication, which contains scientific articles of students, graduate students, Candidates and Doctors of Sciences, research workers and practitioners from Europe, Ukraine, Russia and from neighboring countries and beyond. The articles contain the study, reflecting the processes and changes in the structure of modern science. The collection of scientific articles is for students, postgraduate students, doctoral candidates, teachers, researchers, practitioners and people interested in the trends of modern science development.

The recommended citation for this publication is: Liubych V.,
Baking properties of spelt wheat // Innovative technologies in science and education. Abstracts of IX International Scientific and Practical Conference. Jerusalem, Israel 2021. Pp. 12-14.

URL: https://isg-konf.com.