ISSN: 2181-4341, IMPACT FACTOR (RESEARCH BIB) – 7,245, SJIF – 5,431

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THE USE OF HIGH-POTENTIAL SECONDARY THERMAL ENERGY RESOURCES

Abstract: The article analyzes the "Secondary energy resources" in the industry of Uzbekistan, examines their operation and use. A new heat exchange scheme for the use of secondary heat and energy resources has been introduced.

Keywords: Heat exchanger, dispersed, secondary energy, edged, IIER, cooling chamber.

YUQORI POTENTSIALLI IKKILAMCHI ISSIQLIK ENERGIYASI MANBALARIDAN FOYDALANISH

Annotatsiya: Maqolada O'zbekiston sanoatidagi "Ikkilamchi energiya resurslari" tahlil qilinadi, ulardan foydalanish masalalari ko'rib chiqiladi. Ikkilamchi issiqlik va energiya manbalaridan foydalanish uchun yangi issiqlik almashinuvi sxemasi joriy etildi.

Kalit so'zlar: Issiqlik almashtirgich, dispers, ikkilamchi energiya, qirrali, IIER, sovutish kamerasi.

The Republic of Uzbekistan is a country with sufficient primary energy sources. Today, its energy resources and production exceed domestic needs by 15-20%. But, like the trend of energy consumption around the world, there was also a shortage of energy for the rapidly developing industry of Uzbekistan.[1]

Therefore, the economical use of thermal energy resources is becoming an urgent problem of modern industry and life expectancy. In order to save primary energy resources, it is effective to use secondary types of energy. These are: renewable (non-traditional) types of energy (QTEK); secondary thermal energy resources (VIR).[2,3]

The state has adopted a number of regulatory documents on the use of QTEK. In particular, the law "On the Rational Use of Energy", adopted on April 25, 1997. The resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated February 13, 2009 "Defines the principles of using non-traditional and renewable energy sources in ensuring the country's energy security for 2009-2013." There are certain scientific works, developments (1) and practical work in this area.[4,5,6]

It's hard to say the same about MIER. Secondary thermal energy resources (VTER) are combustion products (flue gases) emitted from technological units, devices and technological parts – products, waste, satellites and intermediates into the atmosphere – which in this situation can no longer be used, but can be used elsewhere and for another purpose thermal potential.[7,8,9]

More than half of the fossil fuels and 65% of the electricity produced are consumed by industrial enterprises. The efficiency of using fuel heat is low. The coefficient of use of fuel heat in advanced industrial enterprises (EIFC) does not exceed 40%. For example, 190 tons of flue gases with a temperature of 400 °C. are emitted into the environment from 1 compressor unit of compressor stations of main gas pipelines per hour.[10,11,12]

Secondary energy resources (REM) produced in energy-intensive industries of Uzbekistan and their use (million tons of conventional fuel) are presented in the table.

Table 1. The use of fuel and energy resources in energy-intensive industries (million tons of conventional fuel).

Types of IER	It is used in practice		Planned for use
	2015	2020	2020
	Metallurgy		
Flammable	126.9	139.3	147.4
Heating	32.6	41.0	51.8
General	159.5	178.3	198.5
	Chemical industry		
Flammable	0.25	0.49	0.57
Heating	2.96	5.70	8.76
General	3.01	6.19	9.33
	Gas industry		
Flammable	1.4	2.15	2.15
Heating	4.3	6.1	8.95
General	5.7	8.25	11.10
	Oil refining and petrochemical industry		
Flammable	21.10	32.0	42.0
Heating	15.90	25.8	37.30
General	37.00	57.8	79.30
	Building Materials Industry		
Heating	0.16	0.375	0.635
General			
Total	249.86	318.91	385.99

Analysis of the table data shows that Uzbekistan's industry has huge secondary energy resources and their utilization is very low.[13,14]

Thus, for the use of such energy sources, it is advisable to create energy-saving technologies and use efficient heat exchange devices.[15,16]

One of the ways to use IIER is to use air heaters.

Figure 1 shows an upgraded circuit of this air heater, with a low cost of cooling the intermediate coolant.

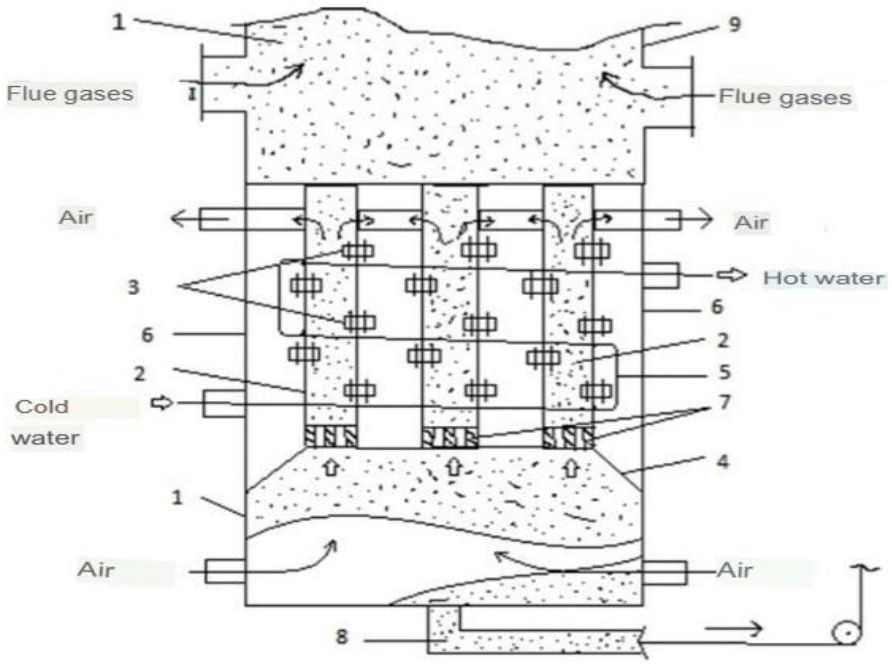

Figure 1. 1- dispersed intermediate coolant, 2- pipes moving down the intermediate coolant, 3- ribbed heat pipes installed on the surface of the pipe, 4- barrier, 5- water channels, 6- cooling chamber, 7- grid, 8- conveyor, 9- heating chamber.

The device works as follows: in the upper heating chamber (9), the dispersed intermediate coolant (1) is heated using high-temperature flue gases. The resulting flue gases are discharged from the chamber into the atmosphere (not shown in the figure). The intermediate coolant moves smoothly into the lower cooling chamber (6) through pipes (2) installed under the upper chamber. The cooling chamber is divided into a lower part by a grate (7) installed under the beam (4) and a pipe (2). The cooled dispersed material is returned to the upper chamber using a conveyor (9). Compressed air supplied from below moves against the dispersed material and heats it. The air moving through the pipe through the dispersed material in it is discharged through a pipe corridor installed on top of the refrigerator compartment and sent to the consumer.[17,18]

A water heating system is designed in the upper part of the cooling chamber. Cold water moves outside the pipes separating the dispersed material along special corridors (schematically shown in the figure), is heated using ribbed heat pipes installed in it and sent for consumption. [19,20]

Summary

The peculiarity of this scheme is that, if necessary, air can be supplied to the space between the pipes from the side edge (not shown in the figure) installed in the partition (4) and heated with a heat pipe.

The use of the proposed heat exchanger accelerates the heat exchange process, increases the efficiency of the device.

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