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TO CONTROL BY THERMAL REGIME OF RECUPERATIVE SOAKERS WITH HEATING FROM CENTER OF BOTTOM

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The analysis of the existent automatic systems for regulation of the thermal regime for recuperative heating soakers with heating from the center of bottom has been realized. The rational chart of stated system, realization which permits to provide necessary quality for incineration of fuel during all process heating of bars in soakers of this type has been offered.

Keywords: recuperative heating soaker, heating from the center of bottom, regulation of temperature, correlation «fuel - air», combustion products, content of oxygen

Recuperative soakers with heating from the center of bottom make 25-30 % from the gross stock of soakers which apply for heating of bars before rolling at the primary mills of metallurgical plants for Ukraine.

Heating of bars in the soakers of this type, as a rule, is executed at the regime, which consists of two periods:

- the first period is the period of heating of bars – carried out by getting up by temperature in the work volume of soaker at the constant expense of gaseous fuel (at constant thermal power);

- the second period is a period for equalizing of bars – carried out at a stationary control temperature in the work volume of soaker.

The in-plant automatic systems of adjusting of temperature and correlation control «fuel - air» are used for process of heating of bars. Controlling influences for the indicated systems is served as change of expense of fuel and expense of air accordingly.

The basic lack of soakers of the examined type is local control losses of air in ceramic recuperate from the side of taking of burning foods. Hereupon generic automatic system of adjusting for correlation «fuel - air» is unable to provide necessary quality of combustion for fuel. It is explained that in the system of adjusting are used facts about the expense of air, given at included to recuperate. At the same time as a quantity of air, practically acting to the burner, is unknown from losses in a recuperate.

The worker, which heats metal, is suffices objectively influenced quality of combustion of fuel with use of some signs (original appearance of flame, speed of temperature height at soaker) at productive terms. It is depends, thus, from qualification worker. Usually this procedure is carried out by the change of fuel expense at the hand regime so that to provide maximally hasty growth of temperature in a

coaker at the present given of air. Errors at installation of the system of correlation «fuel - air» promote the specific expense of fuel for heating of metal.

For the improvement of quality of incineration of fuel in-process [2] there are use the automatic correction for coefficient of air expense at content of oxygen in outgoing foods of burning. Such system allows to get an effect at presence of supply for quantity of air which can be given to burner by blast facilities and it is unable to work, when losses of air at the highway of taking of burning foods this supply is leveled.

For adjusting by the thermal regime in-process [3] soaker of this type additionally to the general automatic systems was equipped automatic systems of adjusting for fuel quality at content of oxygen in burning foods taken away from hyper-nozzle space of recuperate.

At first period of heating for bar the automatic systems of adjusting of temperature and correlation «fuel - air» provide, accordingly, maximal given of fuel and air. Whereupon, at the fixed maximally possible expense of air, the automatic system of adjusting for percentage of oxygen, affecting additional regulative organ on the pipeline of fuel given, provides the quantity of fuel at accordance with the set percentage of oxygen in outgoing foods of burning. Thus, the given of gaseous fuel is carried out at accordance with the unknown maximal quantity of air to a burner.

During a second period of heating, at the conditions of gradual decline for expense of air against a maximal size, only the general automatic systems of adjusting for temperature and correlation «fuel - air» are work.

By the lack of such chart of control for the thermal regime of recuperative soaker with heating from the center of bottom there is a presence of the additional automatic system for adjusting of percentage for oxygen in outgoing foods of burning and necessity of equipment of this thermal aggregate the additional regulative organ of gas expense.

A task is an improvement of the existent automatic systems of adjusting for the thermal regime of recuperative soakers with heating from the center of bottom.

The new system of automatic control of the thermal regime for soaker of this type is offered, which provides necessary quality of combustion of fuel during all process of heating of bars.

In the offered chart the automatic system of adjusting for temperature is involved and, the automatic system of adjusting for percentage of oxygen in outgoing foods of burning uses, instead of the automatic system of adjusting for correlation a «fuel - air».

At Unlike the general automatic system of adjusting for temperature in which control influence is the expense of fuel serves, at the offered automatic system of adjusting of temperature by influence control is a change of expense of air. Thus by control influence at the new automatic system of adjusting for oxygen percentage in outgoing foods of burning is the change of expense of fuel.

Control by process of heating for bars is carried out as follows. After loading of bars to a soaker the automatic system of adjusting of temperature provides the maximal degree of regulative organ opening, set on the pipeline for admission of air,

id est carry out stabilizing of maximally possible and exactly unknown expense of air, entering to burner.

In turn, automatic system of adjusting for percentage of oxygen in outgoing foods of burning, affects regulative organ, set on the pipeline of admission of fuel, and changes the expense of fuel, entering to burner, such, that the set content of oxygen was supported in foods of burning. As a result, the set coefficient of expense for air is provided. After achievement of the set temperature in the work volume of so-aker her value is stabilized by the corresponding decrease of fuel and air cutting at the observance of the set percentage of oxygen in outgoing foods of burning.

Conclusions. At recuperative soakers with heating from the center of bottom general automatic system of adjusting for correlation «fuel - air» does not provide the required quality of combustion of fuel from the out-of-control losses of air in ceramic recuperates. The high-quality adjusting of combustion of fuel with the automatic accounting of change for air losses in recuperates during the campaign of soaker can be realized by combination of adjusting for temperature by the change of air expense with adjusting of expense for fuel at the percentage of oxygen in outgoing foods of burning.

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