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VARIANTS FOR INTRODUCING THE OPERATING FLUID IN THE SPACE BETWEEN THE ELECTRODES DURING THE COMPLEX EROSION PROCESSING

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ABSTRACT: Unfolding of the elementary processes within the working area takes place in the presence of working liquid. This paper presents the influence of the way the working liquid is introduced in the space between the transfer object and the object of processing upon the technological characteristics. Also the advantages and disadvantages for different ways of cleaning within the working area presented in order to unfold the elementary processes.

In order to unfold the elementary processes in the working area the presence of an electrolytic working area is necessary (very often solution of soluble sodium silicate). The liquid may be introduced in the working area in two ways: using a jet (figure no. 1); by dipping object of processing (OP) and partially transferring object (OT) within the working area ML in tub Cv (figure no. 2).

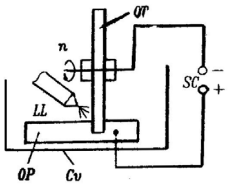

Fig.1 Supplying with jet electrolyte

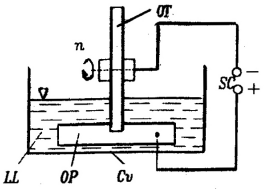

Fig. 2 Supplying with electrolyte through dipping

The advantages of the two ways of cleaning the working area are as it followes:
Jet method:
- smaller volumes of the reservoir and implicitly smaller liquid quantities; the absence of sophisticated systems to watertight the working area (the working precincts); using a pump with relatively smaller flow, thus being necessary a single pump.
Dipping method:
- the superior quality of the processing (smaller width of the scission, lower rugosity, relatively lower wearing); simpler working precincts; higher stability of the erosion process.
Althemore there are disadvantages for the two methods:
Jet method:
- bigger widths for the scission; impossibility for accomplishing the guiding of jet in ML in corresponding conditions (in some cases); the necessity for some complicated constructions of the systems in ML, respectively of very high flows in the case of big activ areas; complicated working precincts equipped with ventilation system for aerosols evacuation:
Dipping method:
- necessity for two pumps in ML, one with high flow to fill the tub (minimum filling time) and the other with lower flow to recirculate the working liquid; more complicated watertighting systems of the working area in case of an OP of a very big length or complex geometrical forms (to reduce the dimensions of the tub; more increased volume of the working liquid, sothat the storage reservoirs have a greater capacity;
Taking into account the advantages and disadvantages, the next issues are advisable:

- if it possible the processing machines for complex electrical erosion should allow both jet processing and dipping the processed object; in case of the smaller pieces, with smaller interaction surfaces using the jet processing; in case of the bigger pieces, with bigger interactive surfaces using the dipping OP processing; sometimes there are cases when the jet processing is not possible, so the dipping processing is obligatory.

In order to avoid the passivazation of the processed object, in the case of dipping processing it is necessary for OP and the tub to be at the some electric potential. The necessary function (storage, recirculation, cleaning, etc.) may be assured with a structure of the system presented in figure no. 3.

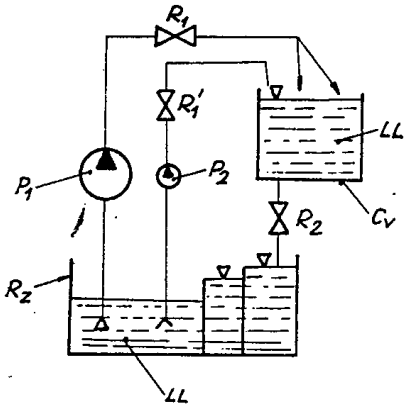

Fig. 3 The structure of the supply system with electrolyte through dipping and jet

The reservoir R_z is equipped with caviling in order to accelerate the cleaning trough decantation talking into account the fact that the circuit cannot be equipped with filter because of the special character of the liquid. The working liquid is absorbed through a whirlpool and through the connection pipe towords the working tub. The processing pipe is equipped with a tap R_1 which adjust the flow of the working liquid, especially in the case of the jet processing. In the course of the dipping processing, especially for greater volumes of the tubs C_v, the circuit is equipped with second pump P_2 with a smaller flow. The aim is to recirculate the working liquid or for supplementary of the liquid in the working area. In this case the pump P_1 with a greater flow is used only to fill the tub in a shorter time. The emptying is equipped with another tap R_2 used especially for dipping processing for regulating and maintaining the constant level of liquid in the tub.

Conclusions:

From what we have presented above one can the conclusion that both the method of introducing the liquid in a jet in the working area and the method of dipping the object for processing present a series of advantages and disadvantages as well. With regard to the influence they have upon the characteristics of the processing one of the two methods may be chosen.

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