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THE PERSPECTVE INFORMATION TECHNOLOGIES EFFICIENT REALIZATION AT THE GRAPHICS PERFORMANCE FOR THE MEAT SYSTEMS COMPONENTS SIMULATION

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The “Microsoft Windows 7” perspective operating system (OS) arrival has become a new step in the realization efficiency rise of the profiling new graphics models of the force – meat structure. The new operating system (OS) is distinguished by the high reliability, the large – scale productivity, the advanced graphical interface, and the advanced operation facilities, as in the global area, well as in the local area networks (LANs).

The application of the 64 – bit computations in the “Windows 7” operating system (OS) is permitted to use a more 4 gigabit main memory, owing to the “Core i7” platform by three exchange channels (DCC) on the basis of the 45 – nanometer technological process of the DDR3 type. The conversion to the parallel computing is practically provided the following core sets expansion in the computer processors. The new generation programs of the “Windows” operating systems (OS) are optimized the multi – nuclear computer processors possibilities (e.g. 2–, 4–, and 8 – nuclear ones). It is expected the following expansion from 16 up to 64 cores sets in the computer microprocessor in the near – term outlook. So, it has been obtained the PC higher productivity of more, than four teraflops (TFLOPS) at one graphics processing unit (GPU), and 240 data flow processors, having the 16 gigabytes memory capacity, on the basis of the “Nvidia Tesla” computing systems, and without the main computer processor operation.

The “Core i7” new generation chips of the 45 – nanometer technology on the basis of the “Nehalem” micro – architecture with the built – in memory controller into the processor have increased the operation velocity of the main memory for 50 per cent that resulted in the computer power has been increased for two orders more. The “Nvidia GeForce GTX 280” graphics card, at the multi – data flow processors and one gigabyte display memory on the frequency of 1,296 megahertz, has provided the graphic presentation efficiency of the rheological and structural profiles of the meat system for 50 per cent higher, than at the present “Nvidia GeForce 8800” graphics card on the basis of the “GT 200” new graphics processing unit (GPU), having performed by the 65 – nanometer technological process.

These graphics cards of the high definition (XHD) on the wide screen monitor within the ultra-high resolutions are being provided in 7 times brighter and more sharp presentation image of the meat profiles and the histological sections, in comparison with the screen monitors, having their less resolution, and they are printing in 2 times more sharp image, than at the displays of the existing park.

The “NVIDIA CUDA 3” technology is being opened all the possibilities of the GPU main core sets, thus, having accelerated the most exacting system tasks, for example, the video conversion, and, having provided almost the sevenfold increase in productivity, in comparison with the traditional GPU.

The “NVIDIA HybridPower 5” technology is provided automatically to switch from the “GeForce GTX 280” graphics card to the “GeForce” graphics processing unit (GPU), which has been integrated into the system board, in a case of its operation with so called “not difficult” graphics applications. This operation is, practically, resulted in the noise reduction and also the considerable energy conservation.

Table 1. The “GeForce GTX 280” Specifications

Data flow processors	240
Core set frequency (MHz)	602 MHz
Shader unit frequency (MHz)	1296 MHz
Memory frequency (MHz)	1107 MHz
Memory capacity	1G
Memory interface	512-bit
Memory bandwidth (Gb/sec.)	141.7
Textures mapping velocity (bln./sec.)	48.2

The «Super Speed USB 3.0» new technology has been provided the graphics files communication of the time history image of the functionally and technological parameters of the meat systems between the peripheral units and the computer, having memory capacity more, than 30 gigabytes, in 10 times fastly, than the “USB 2.0”, which is now existing. For all this, the maximum data transfer rate (DTR) on the biochemical – and functional –, and technological parameters of the meat product at the “USB 3.0” application, simul-

taneously to the both sides (e.g. the duplex data exchange) has been made up 5.0 gigabits per second. This new "USB 3.0" standard is being supported only by the new "Windows 7" operating system (OS).

Thus, the new "Windows 7" operating system (OS) realization will be permitted to carry out the new qualitative and quantitative conversion to the productive systems (PS) of the present generation hardware control and software control devices of the graphics and the data processing (DP) with the high levels performance of the reliability and efficiency meat system component composition designing at the meat products production with the specified food and biological parameters.

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THE THYRISTOR TRANSDUCERS WITH THEIR CAPACITIVE SWITCHING

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The thyristor inverters with the capacitors in the power circuit are designed for the electronic welding apparatuses, the plasmatrons power sources and so on. All these inverters are efficient and functional only in the limited load range, that is the essential defect, and this is restricted by their use range. In particular, such inverters are non – serviceable at the idle running and in the small loads range. It should be noted, it is talked on the inverters on the reverse – blocking thyristors, which are being blocked at the natural current fall down to the zero, or they are needed the reinforced switching [1]. The thyristor inverters of such type, which have been suggested earlier, for the load range extension are used the additional block, having provided the latitudinal and pulse control of the load current in the wide range [2]. The linear external characteristics are needed for the stable work of the welding load. So, it is quite possible to provide the linear external characteristics in the power sources of the inverter type with the capacitors in the in the power circuit at the latitudinal and pulse control, having only the 2 – 3 – multiple stress factor [1], that results in the proportional increase of the apparatus rated capacity. Besides, the two parallel circuits presence of the switching capacitor (SC) recharge, inevitably, results in the constant component appearance in the transformer current, which has been described in the [2] diagram, that it is needed the considerable increase of the transformer overall dimensions, in order to avoid its saturation. The new diagram of the thyristor inverter with the capacitors in the power circuit has been suggested in [3], and it has been given in the figure 1. The suggested apparatus diagram is consisted in the 1 ÷ 4 thyristor bridge, having connected to the direct current (DC) diagonal to the power source 5, having shunted by the filter capacitor 6. The primary winding 7 of the transformer 8 has been inserted into the 1 ÷ 4 thyristor bridge of the alternating current (AC) diagonal, sequentially, with the switching capacitor 9. The secondary winding 10, sequentially, with the load current sensor 11 has been connected to the diode rectifier 12, the direct current (DC) outputs of which have sequentially been connected to the choke 13 to the load 14. Besides, the apparatus is contained the expansion range control block 15 and the control system 16, having made with the latitudinal and pulse control, and having closed by the negative feedback along the current by the signal from the above – mentioned load current sensor 11, having connected to the corresponding control system input 16, the corresponding outputs of which are connected to the thyristors' driving points of the 1 ÷ 4 thyristor bridge.

The expansion range control block 15 has been made by the principle of the transmission, having accumulated in the electromagnetic energy inductance from the source to the receiver, and it, moreover, is contained, as the electric power source, the additional winding 17 of the transformer 8, having connected to the diode bridge 18, the direct current (DC) diagonal of which has been shunted by the smoothing capacitor 19 and the voltage sensor 20. Besides, the above – mentioned the direct current (DC) diagonal of the diode bridge 18 has been loaded on, sequentially, the joining circuit from the current sensor 21, the inductance 22, and also the transistor switch 23, having connected to the direction of the conducting current. The corresponding filter capacitor 6 outputs have been connected to, in parallels, the transistor switch 23 through the pick – off diode 24. The driving point of the transistor switch 23 has been connected to the microcontroller 25 output of this switch control. The corresponding microcontroller 25 inputs have been connected to the current sensor 21 output and also to the differential amplifier 26 output, the direct input of which has been connected to the voltage sensor 20 output, but the inverting input has been connected to the load current sensor 11 output.

Firstly, the circuits are absent, which are in parallels of the primary winding 7 of the transformer 8, in the suggested apparatus, that is provided the constant component absence in the above – mentioned winding. Secondly, it is being observed the I_d / f = const ratio, where f – the inverter frequency, I_d – the load current, at the load current increase, that it is provided the linearity and the high rigidity of the external characteristics at the voltage control at the expense of the power source.

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