SUMMARY

Bratu P. **Analysis of dynamic behaviour of moulding machines used in the technologies of constructions**. **Part I.** The work deals in a unitary way with the dynamic analysis and the synthesis of moulding machines performances used in the technologies specific to works of constructions. Thus, the conceptual substantiation, the physical and mathematical modelling of moulding machines in interaction with the processed material have as a basis theoretical and development researches elaborated within the programs of research co-ordinated by the Ministry of Education and Research. In this work, there are emphasized, in a synthesis, the main problems relating to the dynamic parameters of moulding machines in stabilized regime, necessary to accomplish the technology.

Ionescu F. **Structured mathematical Model Generation, Simulation and Control of Hydraulic and Pneumatic Drive Systems with HYPAS.** The importance of computer aided design, modeling, and simulation in the field of control systems has been prominent in recent years. Hydraulics and pneumatics are automation fields with increasing development. The user of these installations is interested to design an plant as quick and as well as possible, if it is possible without to be obliged to write down own differential equations. The author developed an own approach and finally a software, called HYPAS, destined to aid the engineer to easy mathematical describe/model and to simulate its plants, without the user must write down any differential equations and to manipulate formulas and nonlinearities. HYPAS is a software tool that allows the user, by just moving of assigned icons to the functional elements, to interactively design and automatically generate mathematical models of hydraulic and pneumatic drive installations, as well as to simulate them. The aim of the paper is to introduce HYPAS with its philosophy and approaches as work medium and to present some of its tools.

Pruteanu O. **Working Parameters Influence of Plane Grinding upon Surface Roughness, Cutting Forces and Wear Angles of Abrasive Disk.** The technical paper presents the equipment, material and abrasive disk used and experimental research method also. For the third analyzed situations: surface roughness, cutting forces and wear angles of abrasive disk are present the experimental results and conclusions.

Andrievschi S. **Process of mixing in mixers with working bodies as rods**. Process of mixing in mixers of new type with working bodies as bars is described. At passage of an individual stream of particles through five lines of bars normal distribution of a material on length of the mixer turns out, and at passage through 39 lines - uniform distribution.

Andriuţă M. **To a question on forecasting dimensional parameters of digging machines on the basis of statistical models.** New mathematical models for calculation of dimensional parameters of hydraulic dredges are given and limits of applicability for this purpose of the textbook published in 1988 are proved.

Avram E., FuioreaI., Camerzan A., Todirica C. **Magnetohydrodynamic sealings.** In the paper we propose a theoretical approach and a calculating methodology for fixed and mobile sealing achieved by utilizing ferofluids (fluids having magnetically characteristics). Starting from the fundamental equations of the magnetohydrodynamics, calculus relations of the sealing are found out. Then, the relations usually presented in the speciality literature are also presented, and a calculus methodology is established for the fixed and mobile (with translation or rotation movement) sealing.

Bardac D., Rânea C. **Aspects concerning the study of the technological shape optimization for a connection piece.** This paper presents a study regarding the optimisation of the technological form of a connection piece – flange type – using Visual Nastran and Solid Works.

Boguoslavskiy V., Galkina A., Asmanove A. **The influence of cutting fluid technological on a temperature field of a cutting tool.** The stability of a cutting tool is a major factor which limits processing capacity of metals by cutting. The stability of the tool is influenced by physical and chemical processes descending in a cutting zone. Among these processes, the main one is temperature in a cutting zone. That is why definition of a temperature field of a cutting tool by a computational method introduces large idealized and practical concern.

Bostan I., Dulgheru V. **The elaboration of multiple precessional gear theory and modern manufacturing technology.** The engineering complex study of the triad "gear-technology-transmission" has permitted to elaborate a new type of precessional transmissions with multicouple gear. In this paper, the authors present the mathematic models of the precessional multicouple gear and of the manufacturing technology. A computer program for doing this was also elaborated.

Bostan I., Topa M., Topa A. **A method of grinding wheels' teeth of precessional gears.** The wheel's fabrication with a non-standard profile needs new technologies of execution. A grinding using a disk-tool will increase the productivity, comparing to the existing method. In the article are presented: analytical description of precessional wheel teeth' working surface, analytical description of obtained surface when grinding with a disk tool and the needed device.

Bratu P. **The dynamic analysis of the vibratory processes on the quality of concrete compacting works, of hydrocarbon pavement mixtures and of earth.** This work is treating the specific problems of the technological processes of vibratory compaction of materials with non-linear behavior. In this context, theoretical and practical results were obtained, emphasizing the high weight of the internal energy dissipated in comparison with the high degree of the limo us non-linearity of the analyzed materials, such concrete, hydrocarbon pavement mixtures or earth.

Bratu P., Bordea C. **The performance level of hydrocarbon pavement mixture preparation stations.** This work deals with the performance requirements for the hydrocarbon pavement mixture preparation stations. The constructive solution for the structure of these equipments is according to standard EN 536/1999.

Bratu P., Bordea C. **The influence of asphalt finishers performance for road quality.** The work presents the influence of the asphalt finishers' parameters for the quality of roads surface. Therefore, there are presented the real technical data obtained through experimental way during the technical attestation according to the Machines Directive 98.37CEE and to the Constructions Directive 89/106.

Bunea M., Cherecheş T. Rosniîche G., Verţan H. **A form of relations for the calculation of forces, moments and of the cutting power and leading power in processing of the deep hole boring.** The characteristics of the tools, the technological processes and machine tools used in the mechanical treatment of the deep holes must be exposed and found in the relations of calculating the forces and moments of cutting, the cutting power and the lead power. Therefore, the scientific dimensioning of the cutting tools elements and choosing of the proper machine tools suppose to know the value of the forces and moments of cutting, the cutting power and the lead power displayed during the process of cutting which work upon the tools and machine tools. In this work we have adopted and developed general relations from the cutting theory for the mechanical treatment of the deep holes, establishing altogether some new relations derived from the dynamic balance theory.

Buzescu F.- L. **A new mathematical model on the dynamic behaviour of the mechanical system of baloon spinning.** The study proposes a new mathematical model describing the performance of the mechanical spinning system on the ring spinning machine. The mechanical spinning system considered in the study is formed of the following elements: the reinforced spindle-package assembly; the ring solidary with the ringrail segment corresponding to a spindle, and the

traveller. The simplifying working assumption adopted in the present study restrict only to a certain extent the general character of the dynamic problem considered, comparatively with the classical models. Settlement of the motion equations of the mechanical spinning system is based on Lagrangean formalism. The mathematical model thus established provides solutions to all problems studying the performances of the mechanical spinning system, both in a transitory and in a permanent regime, the differential motion equations permitting the establishment of the conditions – the driving ones, especially – the stresses should meet, so that yarn's twisting should occur as a stationary process.

Călăraşu D. **The dynamicmodel of a servovalve SV60.** The servovalve is essentially a regulating system. The output (flow, pressure) is controlled by the electric control input. There is a negative feedback. This feedback can be mechanical, hydraulic and electrical. The analysis is realized on linearising mathematical models. The paper presents the mathematical model for a SV60 servovalve. The dynamic conduct of a servovalve is described by means of the equations of the constituent elements. In this way it is obtained the block diagram that permits the numerical simulation of the servovalve using the state variable method.

Cherecheş T., Bunea M., Enache C., Muraru C. **A mathemetical model for the determination of the cutting optimum form in the deep hole boring process.** The design of a technological process supposes that the technologist should adopt some decisions in order to obtain the realization of the product in conditions of maximum productivity, at minimum costs and high quality. Taking into consideration all these criteria leads to the idea of creating an optimal technological process. The optimization of the conditions in which a cutting mechanical treatment process develops, needs the optimization of the factors determining the cutting process regime, that is the cutting depth (***t***), the lead (***s***), the cutting speed (***v***) etc. Also, in this case, the optimization of the cutting regime is based on the objective functions represented by the minimum costs, maximum productivity etc., as well as a series of restrictions.

Chirilă V. **Experimental study on errors of shape when finishing the interior cylindrical surface.** The paper presents some experimental results, obtained after measuring the errors of circularity shape when honing cylindrical surfaces.

Cohal V. **This paper presents the influence working parameters on the surface roughness for materials 40Cr10 and RUL 1 in flat lapping.** Research has experimentally demonstrated the dependence of roughness R_a on variables ***e*** (eccentric), n_e (number of rotations of the eccentric), ***n*** (number of rotations of the main axle), ***P*** (working pressure) and ***t*** (operating time). The curves evince a tendency to going down, so that the higher the value of the respective parameter, the lower roughness R_a**.** As can be sun from the respective graphs, the curves corresponding to the functions for 40Cr10 display a more prominent tendency to going than that corresponding to RUL1. Therefore material 40Cr10 may be said to lend itself better to being processed.

Corobceanu V. **Workability of metallic fibre reinforced concrete.** The effects of the main characteristics of metallic fibers used for concrete's discontinuous reinforcing (geometric ratio, longitudinal profile and reinforcing volume fraction) on the materials workability are analyzed. The fact that the cements dosage takes an important influence on this parameter is presented as well. Our experiments are made on high strength concrete based on high cement dosage.

Drăghici G. **Product Modelling in Integrated Engineering.** This paper is a synthesis over the evolution of product models developed in the domain of Integrated Engineering. It presents: modelling through domains, *function - behavior – state* modelling, graph-product modelling, modelling through functions and entities, multi-views modelling. The last one includes activities of the life cycle of a product in the stage of conception by integration of ensemble of knowledge of the professions that intervenes.

Ene O, Porosratcovski V. **The re-equipment of tractor engines for diesel-gas functioning.** In the work paper is mentioned the importance and the advantages of diesel engines re-equipment for operation on "gas-diesel" cycle, by implementing additional constructive applications and applying ingenious engineering solutions. There are presented formulas for determination of main parameters of the gas diffuser-mixer.

Ene V. **Tribological behavior of the piston rings with different profiles of the contact surface during exploitation.** In the work paper are presented the results obtained from experimental, model and exploitation researches, effectuated over piston rings with different profiles of the exterior surface, situated in permanent contact with the cylinder liner. Comparative experiments have shown the utilization effectiveness of double-barreled piston rings regarding oil consumption and cylinders' wear.

Hanganu A.C., Chiriţă C., Javgureanu V. **Considerations on the utilization of virtual reality in computer-aided design of technological devices.** Virtual reality comprises a large range of technologic and equipment (electronic equipment, hydraulic equipment, real-time computing systems, optic design), that governs sensations appealing to human senses (seeing, hearing, feeling). Among these, the visual sense is the most intensely used in virtual reality, because most pieces of information on the environment are obtained by seeing. The visual image is the essential component of virtual reality, enabling the user to identify the environment in which he is present, to orient himself and act and, thus, most research studies in the field of virtual reality were made in the field of graphics and image generation. Thus, the problem of virtual reality utilization in computer-aided design of technological devices has risen.

Hincu C., Sârbu I. **Analysis of waviness to grinding.** Various aspects of waviness generated on the grinding workpiece and wheel circumferences are investigated with the aim of studying chatter vibration. For such a study it is also essential to consider the coefficients of wheel contact stiffness and grinding wheel wear. It is shown that these coefficients are non-linear in character and therefore they influence the linearity of the basic equation describing the vibratory motion. Nonuniform hardness and unbalance in a grinding wheel are studied as possible sources of accelerating the growth of self-exited vibrations.

Ivchenko T., Bobeer N. **Research of temperatures on a forward surface of the cutting tools edge.** With use of the method of sources of heat is developed the technique of temperatures account on a forward surface of the cutting tool edge. The analysis of influence of parameters of the tool on temperature of its edge is executed. Character and degree of influence of the tool material properties and the tool geometrical parameters on distribution of temperatures on a forward surface of an edge are established

Javgureanu V., Stoicev P., Chalmuţchii V., Roşcovan Gh. **The experimental research about physico-mechanical properties of ferrous-nickel plating.** The work presents the examination of some physico-mechanical properties of ferrous-nickel electrolytic plating with the kaprolactam content , which has been obtained from a new electrolyte. As a result in these investigations the optimal concentration of the kaprolactam in electrolyte has been determined.

Kovalenko V.I., Shapoval E.A. **Installation of yardsticks of resemblance at analysis of the hydraulic installations of percussion action.** In research of a working process of the installation was established, that the power of impact N depends on the several independent factors. With usage π - theorems are analyzed 13 basic variables and it is established, that the working process of the installation can be described by ten (13-3 = 10) combinations (criterion of resemblance) $\pi 1$, $\pi 2$ ... $\pi 10$.

Leohchi D., Popovici A., Oprişan C. **The determination of the kinematics parameters for operating the mechanism of the circuit breaker.** The determination of the kinematics parameters is presented in this paper by dynamic analysis of the

operating mechanism. This mechanism achieve the displacement of the movable contact of the circuit breaker. The dynamic analysis is achieved for the operating mechanism of the middle voltage circuit breaker. The equation of motion for operating mechanism is a differential equation of order two. The numerical method Runge - Kutta of third order is applied to solve the equation of motion. The experimental results correspond to good values obtained by compute. Consequently, the proposed dynamic and mathematics models are verified by measurements.

Moraru V., Crăciun Al., Crăciun Sv. **Elaboration and investigation of the technological lubricants for separating and form changing operations at the cold stamping.** This paper shows the results of laboratory and factory experimental investigations on the effectiveness of technological lubricants, which are used in separating and form changing operations of cold stamping. The firmness of working elements of the dies is experimental valued by using different types of the lubricants.

Oprişan C., Popovici A., Leohchi D. **Contributions to the synthesis of the Watt and Stephenson mechanisms with adjustable in steps links.** The paper presents ways of modelling for the synthesis of the Watt and Stephenson link adjustable mechanisms, for prescribed positions. The mathematical model has the shape of an system of nonlinear equations determined on the basis of the input – output equation. The dimension of the variable synthesis parameters vector depends of the adjustable links number.

Procopiuc Gh. **Conformally-flat solutions for a radiative relativistic fluid sphere.** In this paper solutions of the equations of the relativistic perfect fluids are analyzed as relativistic models of a radiating balanced sphere. We present a conformally flat metric representing the gravitational field of a spherically symmetric distributions of a radiating perfect fluid. A particular case of the solution is discussed and corresponding expressions for fluid energy density, pressure, radiation flux and radiation energy density have been derived.

Severincu M., Dumitraş C. **The functional construction principle of the milling cutters with uninterrupted sharpening and mechanically clamped inserts.** In this paper one present the principle of uninterrupted sharpening of the milling cutters. This type of sharpening offer the following advantages: simultaneous sharpening of the inserts, great simplification of the cutters grinder's kinematics, elimination of the grinding wheel wear. Also one give a number of characteristics of the face milling cutters are presented which can be extrapolated to any type of uninterrupted sharpening tool with inserts.

Severincu M., Dumitraş C. **The determination of the positioning angles in sharpening Romascon cutters with the tooth axis parallel to the shank of the cutter axis**. In this paper one present the relationship between the positioning angles of the grinding wheel and the work parameters of the inserts on the milling cutters expressed as mathematical equations. These relations are given for both clearance surface and rake surface sharpening.

Stan G., Savin C. **The Dead Stroke and the Choice of the Bearing Type of the Ball Screws on CNC Machine Tools.** The manufacture of high performance CNC machine tool rise a series of new problems and establishing of the dead stroke is one of them. This work is presenting the sources of the dead stroke, as well as a series of steps for minimizing it. One of the sources of the dead stroke is the ball screw bearing. The optimization of the bearing type choice is presented, with a view to obtaining the smallest deformations, correlated to the type of the kinematical linkage and to the forces in action.

Ungureanu V. **The effect of strain path over the forming limit diagram and forming limit stress diagram used in the simulation of sheet metal forming process.** This paper deals with the experimental determining of forming limit diagrams and forming limit stress diagrams at the necking of sheets metal obtained using testing methods like tensile tests, compression tests and Marciniak tests. The forming limit diagrams and forming limit stress diagrams were obtained using direct strain path and complex strain path. The obtained results indicates

that the forming limit diagram's shape and position strongly depends from strain path.