SUMMARY

According to Order No. 5229/2020 of August 17, 2020 regarding the organization and development of the process of obtaining the habilitation certificate, art. 3 ch. I, "*The habilitation thesis reveals the didactic and research capacities and performances. The thesis presents in a documented way the professional achievements obtained after the conferment of the PhD title in science, which proves the originality and relevance of the academic, scientific and professional contributions and which anticipates an independent development of the future research and/or university career*"; as well as art. 7 ch. II, "*The habilitation thesis presents in a succinct and documented way: (a) the main original published/patented scientific results or the professional achievements made public by the candidate in scientific research, didactic, sports, artistic creation, after conferring the PhD title, in the visated doctoral domain. The thesis indicates the evolution of the academic, scientific and professional career, as well as the main directions of its development, in the global context of significant and current scientific achievements in the specialist field of the habilitation thesis author; (b) the candidate's individual ability to coordinate research teams, to organize and manage didactic activities, to explain and facilitate learning and research*".

Thus, the thesis entitled ***Researches and contributions regarding the improvement of mechanical systems characteristics*** is structured as presented in the following paragraphs, in agreement with the above specifications but also with the orientation guide regarding the conceptualisation of the habilitation thesis on the CNATDCU website (CNATDCU).

Chapter 1 presents the evolution of the candidate's academic, scientific and professional career with the results published and obtained in the research directions approached after obtaining the PhD degree in mechanical engineering. Also, the personal skills developed throughout the career in managing and organizing didactic activities, research or in the academic community are presented.

Chapter 2 is dedicated to the presentation of the candidate's research and personal contributions to enhance the characteristics of mechanical systems that prove the originality and relevance of the academic, scientific and professional contributions made by the candidate after the achievement of the PhD degree in science and that anticipate an independent development of the future professional career.

So, in this chapter it is presented how the contact solicitation of different machine parts types influences their operation and how different mechanical characteristics can be improved, being illustrated a model to evaluate the durability of roller bearings that is able to take into account the changes that may occur on the surfa-

ces of the elements under rolling contact solicitation. Other directions approached by the candidate after obtaining the PhD degree aim at the characterization through mechanical testing of new types of materials developed to be used in various applications in the industrial or medical field. The characterization of these materials was carried out by friction or wear tests, by micro-indentation tests to determine the hardness of the superficial material layer and by microscratch tests to analyze the scratch resistance of the superficial material layer. These types of tests were carried out in collaboration with colleagues from the department's collective, but also with researchers from outside the university or with colleagues from other faculties within university. Another direction of research approached by the candidate is related to the experimental study of the noise level and acoustic absorption coefficients, so, at the end of this chapter are presented the researches on the determination of the noise level and the efficiency of different noise attenuators, as well as the absorption coefficients of the materials used in sound insulation, either for elements used in ventilation systems or for elements used in civil constructions (partition walls between rooms, acoustic barrier walls, etc.).

Chapter 3 presents the professional career development plan, in the global context of significant and current scientific achievements in the specialty field, through which the candidate aims to develop his ability to coordinate research teams, organize and manage didactic activities, to explain and facilitate learning and research.

In addition to the list of the candidate's most significant publications (maximum 10), at the end of the thesis are presented the main bibliographic references that are the base of the habilitation thesis elaboration.

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