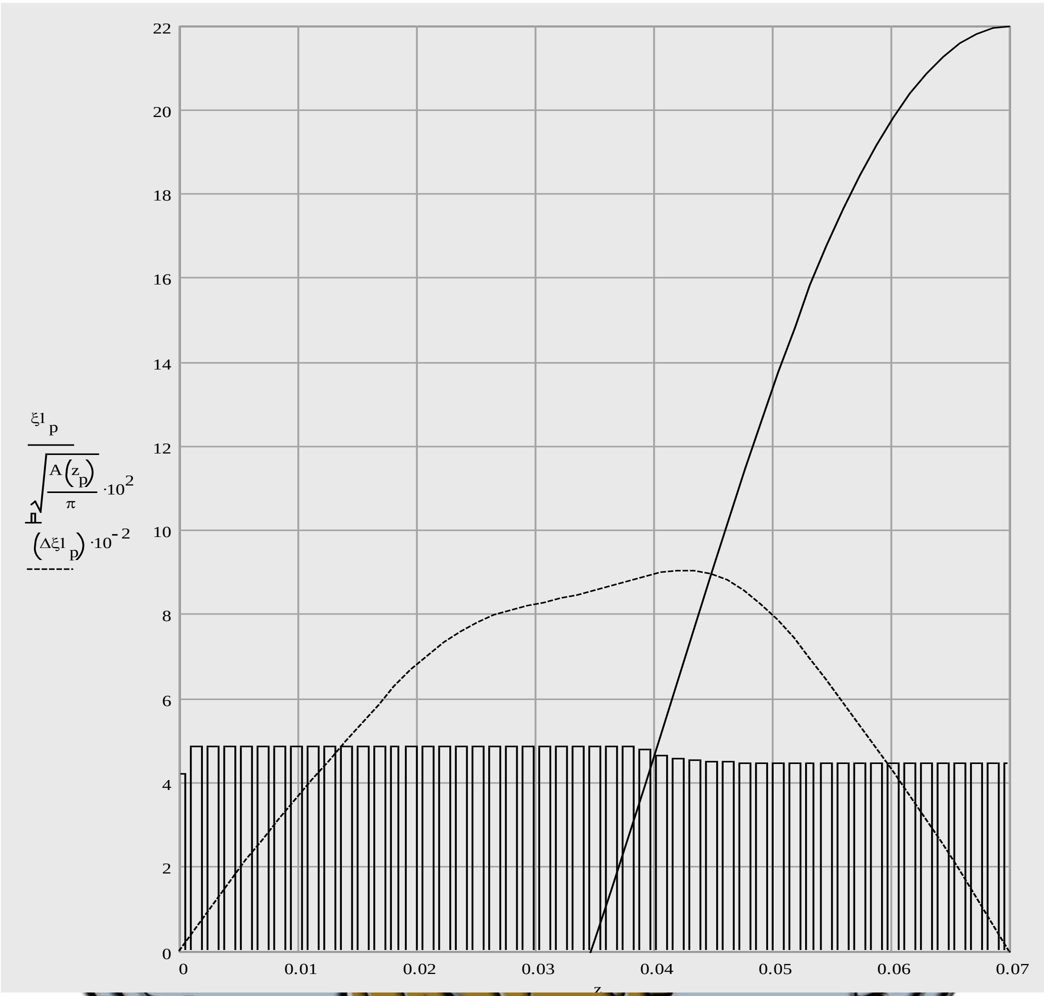

Fig.2 The evolution of vibration amplitude and mechanical tension along the acoustic chain in case of a constant diameter before interface connector salt.

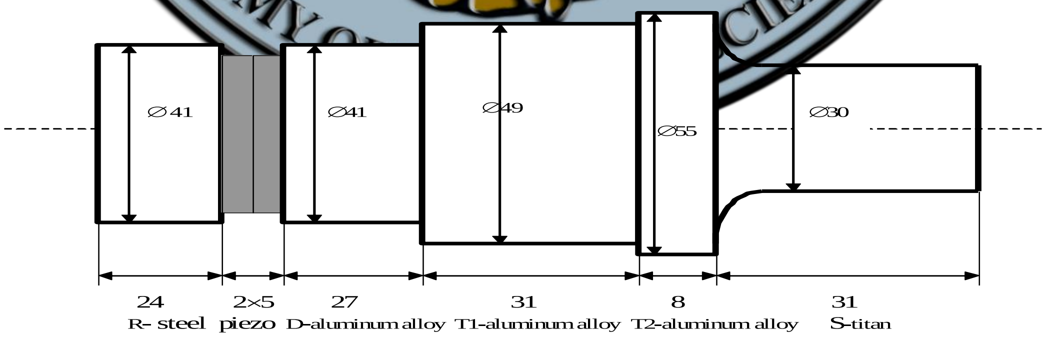

Fig.3 The acoustic chain realized by us for equipping the welding machine.

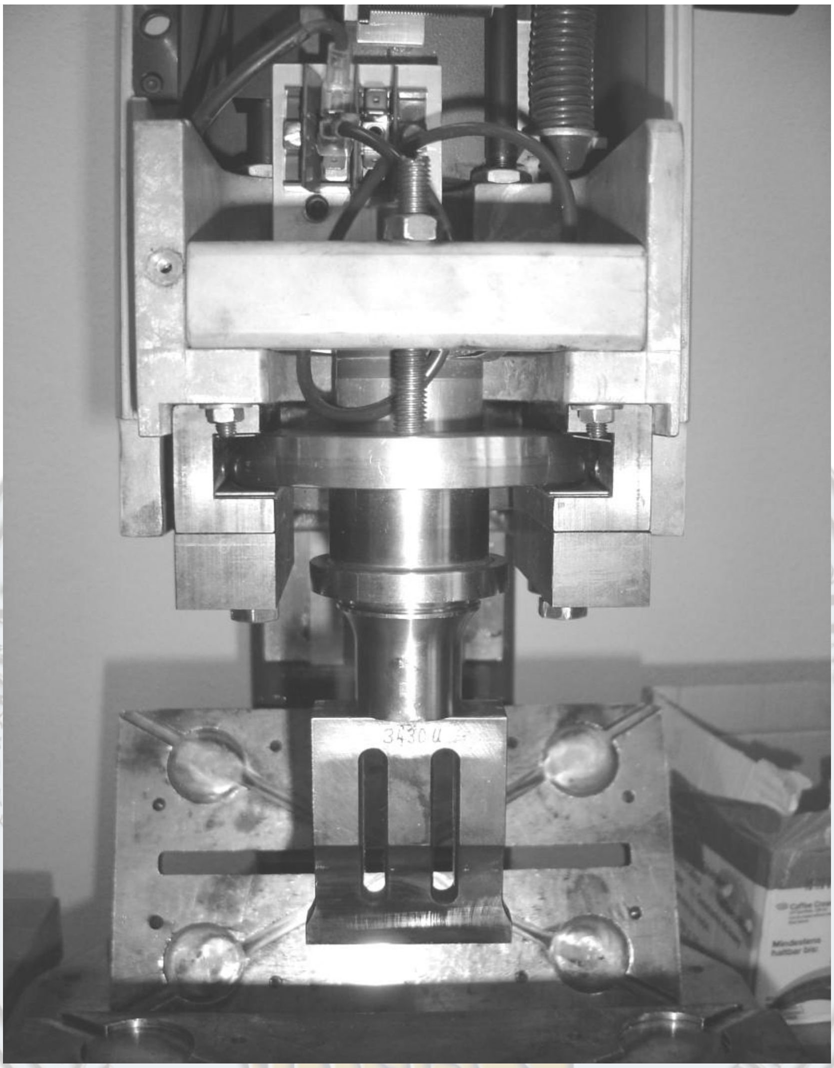

Fig. 4 The acoustic chain realized and mounted on welding machine.

Conclusions

Within this paper we have shown that the propagation theory described in [7] can be applied for longitudinal plane waves through bars having variable section. This theory was applied for the optimization of the acoustic chain used on welding machine TELSONIC - MPS - 2. As a result of this theoretical work, we have obtained:

- An optimum acoustic chain from the point of view of shape, component materials and energy transfer;
- The mathematical model which defines this acoustic chain, and which was introduced in the presented calculus program;

- Excellent agreement between the model and the experimental results based on the above method;
- Excellent theoretical tool for the study the influence of different parameters on final result, all aiming the increased efficiency of ultrasound power transmission;
- An optimum acoustic chain, with help of this analysis;
- A prototype of next generation of welding machine containing a new and optimized acoustic chain with increased efficiency.

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