



Analyzing the Influence of the Construction Element Position on Torque Transmission by Friction

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ABSTRACT

This paper is analyzing the impact of the construction element position of ship winch drum on the effects of torque transmission by friction in the mechanization welding process. The driving and driven wheels (construction elements) were examined for the general case of the load distribution. Based on this examination, the construction of the device that should provide the reliable torque transmission and the movement of the drum in the process of its welding are proposed. This construction is characterized by a high level of flexibility and ability to change the friction torque based on changing drum position in regard to the driving and driven wheels (construction elements). With this new construction, problems related to the movement synchronization are avoided, unlike the all previously known constructions of this type, which lead to the positive impact on the wear intensity of friction gears.

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1. INTRODUCTION

Research described in the paper is related to the problems of friction torque transmission. Research is applicative and connected with design of boot device (reversal) drum ship winches during welding process. Torque transmission is performed by friction tribological contact with rubber and metal. Movement can be reached by using only the effects of friction, but friction during movement always brings different types of losses. Connected with this, knowledge of the value of coefficient of friction is very important for every engineer and designer who is involved in design and development of mechanical structures,

which perform their function through interaction of surfaces which move relatively. It is well known that the process of friction follows every kind of body movement. Friction is a necessary process because only with effects of friction can be achieved starting, moving, changing speed or stopping. On the other hand, during movement, as a consequence of frictional resistance, that resistance must be overcome in order to continue movement, which is why the energy losses exist. In addition to energy loss, friction is always accompanied with wear of material on contact surfaces, which produces an additional costs and loss of functionality of elements in contact.

