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DESIGNING AND TESTING THE SYSTEMS FOR ADVANCED TRANSPORTATION

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ABSTRACT

In this paper truly innovative propulsion processes for vehicles are presented, such as those presented in [Millis & Thomas, 2006], [Vartholomeos & Papadopoulos, 2008] and [Wane & Hongnian, 2009], and also, the systems used in the prototypes developed by the author between 2009 and 2014.

The big difference from the classic propulsion processes is that the new systems do not require traction wheels, nor do they need to interact with the medium through propellers, nor do they require the ejection of mass like jets and rockets. It looks like science fiction but it does work, as the patents registered by inventors and the prototypes tested by the author of this article prove.

According to a NASA report [Millis & Thomas, 2006] the new propulsion systems can fall into three categories. The first class deals with the propulsion processes with displacement of mass, in circular movement [Dean, Norman L., 1959] and [Thornson, Brandson R., 1986] or, with linear movement [Foster Sr., Richard E., 1997]. The second category includes the gyro-based propulsion processes [Laithwaite, Eric and William Dawson, 1999], but distinguishing these from the reaction-wheels, which can only change the orientation of an object as they are used in artificial satellites. Finally, the third category groups new, more theoretical or untested propulsion processes [Forward, Robert, 1963] or [Podkletnov E., and Nieminen, 1992].

The author of this article developed small prototypes of the first category referred to, and installed them in vehicles with four "free" wheels. The tests carried out proved the possibility of displacement of these vehicles, without traction to the wheels, which for that reason designated as 0-WD, compared to the classic systems F-WD, R-WD, and 4-WD used in automobiles and jeeps.

Table-1 shows the main specifications of all prototypes developed and the results obtained in movement tests, all in horizontal surfaces like tables and workshop floor.

Table 1 - Main specifications and test results of 0-WD vehicles.

0-WD vehicle	Mass (kg)	Power (W)	Actuation	Speed (m/s)
Wheel chair-2009	85	-	muscular	N/A
Load cart-2009	100	-	muscular	N/A
Meccano-2010	4,3	-	wheight	N/A
0-WD-2011	3,6	250	electric	0,034
0-WD-2012	125	-	muscular	N/A
0-WD-2014	18,3	620	electric	0,1

The limitations of the tested processes, with small scale prototypes, were reduced speed, small load capacity, and only possible horizontal motions.

In Figure 1 two prototypes of 0-WD vehicles are illustrated.

The advantages of the proposed process are those indicated for all propulsion processes of the first category mentioned, that is, the thrust force is obtained without traction wheels, neither interaction with environment for example with propellers, and without mass ejection from the vehicle as used in jets and rockets.

In future works, the author will construct and test new improvements of these "free" wheels, especially the prototype designated 0-WD-2014 to achieve not only movement in any terrain, with different speeds, but with greater load, and autonomy.

Fig. 1 - Two successful configurations of the tested 0-WD vehicles (0-WD-2011, and 0-WD-2014).

The main aim of future work will be to improve mobility by making all transportation means really safe and efficient by using propulsion systems capable of operating irrespective of infrastructure and weather conditions.

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