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WORMY OF THE TRANSMISSION ENERGETIC AND POWER CHARACTERISTICS

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Abstract
This in the article wormy transfers types, in them friction and of the transmission energetic and power characteristics according to information illuminated passed. Also, wormy of transmissions application sectors structure , types also information about giving passed.

Keywords: Wormy transmission, energy efficiency, power torque, friction.

Introduction

Cylindrical and cone shaped gear from transfers different as a beginning of surfaces extension stocks with connection unclear This will be freedom various rotating surfaces - cylinder , hyperboloid , torus and others-primary surfaces as to be selected opportunity gives . Therefore according to , cylindrical worm gears , globoid, toroid, spiroid , polygloboid and other types available . Many in cases , extension of arrows intersection angle 90 ° equal will be . But wrong angular worm transmissions are also known . Special in cases worm disk or cone shape to receive possible , also worm and worm gear wheel between rotating bodies to be possible . New technological processes and modern equipment worm transmissions many new types create opportunity gives . Extension type when choosing working release opportunities and necessary quality indicators into account to be taken necessary . Modern in cars new kind of worm extensions , intermediate binder elements see possible .

Wormy in gear friction forces – friction and belted gears , friction devices , brakes , clutches, bearings in design is used . Also , wheel - rail , wheel - road coating such as contacts to work suitability in providing important importance has . Friction of strength vector relative movement speed to the vector reverse directed will be and first approaching friction of strength value Kowloon-Amonton law based on determination possible : (Figure 1)

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$$F_{ishq} = -k \cdot N \cdot sgn(x) \quad (1)$$

Here :
k – friction coefficient ,
N – normal reaction power ,
x – elements between relative movement speed .
Friction coefficient experience based on is determined and many in cases accepted as permanent will be done .

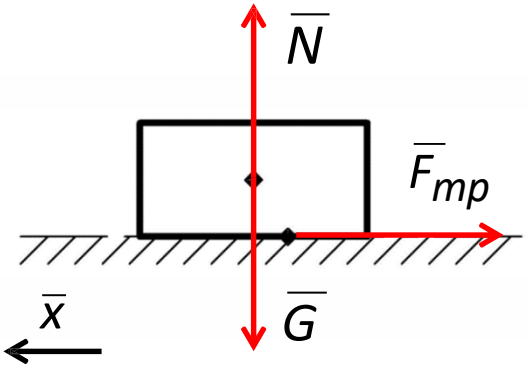

Figure 1. Friction power

Indeed , friction power normal pressure only from the strength not , maybe many also depends on factors mold , friction coefficient permanent not being and many to factors dependency showing is passed . In general friction of strength size one row parameters with unclear related are , they are are the following that is : relative speed , communication in the zone temperature and other one row are factors .
In sources cited experience to the results according to , worm rotation frequency 1600 rpm from zero up to speed when it increases , the worm in the transmission friction coefficient from 0.1 to 0.045 decreases .
Wormy of the transmission energy and power features Mechanical of the transmission main features , movement to change determinant , kinematic transmission ratio , strength transmission ratio and useful impact from the coefficient consists of . This features analysis to do for the most simple method wormy of the transmission analogue was three partial conical is a mechanism .

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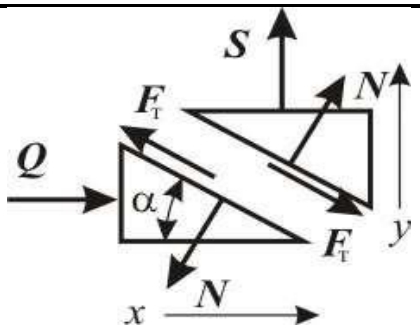

Figure 2. Wormy of the transmission analog - conical mechanism

In the scheme the following marked :

- **x, y** - of connections coordinates ;
- **Q, S** - external forces ;
- **N** - internal force (normal reaction power);
- $\mathbf{F_t}$ - friction power , this and when $\dot{x} \neq 0$ is determined .

Reception made coordinates and of forces positive directions in the picture as shown will be .

Power transmission function following to look has will be :

Power transmission function : $Q=-S \operatorname{tg}(\alpha - k_{r\rho})$ (2)

this on the ground : **tg ρ = k** - angular of speed friction to the corner dependence represents ;

kr = kr (S, $\dot{x}$) - mode coefficient , this and S (external force) and $\dot{x}$ (slip speed) to related ;

kr (S, $\dot{x}$) = kS (S) · kV($\dot{x}$) is the mode coefficient composition ;

kS (S) = sgn (S) — external of power direction determinant coefficient ;

kV($\dot{x}$) = sgn ($\dot{x}$) — slip speed direction determinant coefficient .

This dependency , p= const condition under , wormy of the transmission power transmission function in construction is applied .

$$Q = -S \cdot \operatorname{tg}\left[\alpha - k_r \cdot \rho\left(V_{sk}\right)\right]. \qquad (3)$$

Function (1.24) is discontinuous and many valuable is , the case $x \geq 0$ for following to look has will be : : $k_r(S) \square \operatorname{sgn}(S)$

If the equation $\rho(V_{sk}) = \alpha$ parameters in the field to the solution has If , then based on (3) Function S(Q) many valuable will be .

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This is of the transmission two kind work in mode work means .

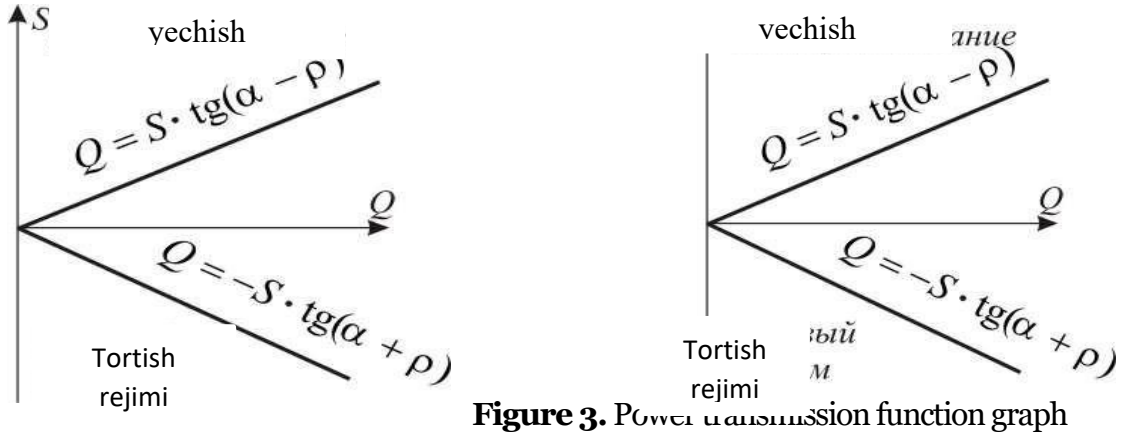

Figure 3. Power transmission function graph

1. **S < 0** : First link (link 1) leader , second link (link 2) subordinate ; this The state is called the " gravity " mode . Energy first from connection second to contact will pass .
2. **S > 0** : Any both connection is also leading ; all energy friction their forces to overcome is spent ; this This state is called " stop " mode .

Conclusion

Wormy extension strength effective increases , but energy effective does not transmit . Its main power high torque and self stop , main weakness and – low efficiency and heat is a divorce . Advantages mainly lower efficiency in return is achieved , this and him/her permanent high at speed working and big power transmitting on devices to apply limits the transmission . in design his/her energy features efficiency , heat separation , power parameters , braking , load lift such as parameters in consideration is taken .

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