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Изготовление образца и исследование кинематических возможностей зубчатой шарнирно-роликовой передачи

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3D

(3D)

Sample production and study of the kinematic capabilities of the gear roller-hinge transmission

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A sample designed to confirm the kinetic efficiency of the wave gear hinge-roller transmission, in which a three-row roller chain is used as a flexible link, was made by the method of 3D printing. The Fused Deposition Modeling method (the most common and available method of 3D printing) ensures the accuracy of size and strength sufficient detail for preliminary kinematic tests of the transmission. The replacement of the flexible gear with a chain can significantly increase the service life of the wave transmission and use it in mechanical drives of continuous action, while standard wave transmissions are capable of operating only in a periodic mode. Unlike other wave transmissions with intermediate rolling elements, the design of this transmission provides symmetry of the load on the rollers located in different rows of the chain, increased durability of the chain due to the exclusion of its rotation in the circumferential direction, the implementation of rolling friction in contact with other parts of the transmission. The test results of the transmission sample showed the possibility of engagement and transmission of motion, the equality of the ratio of a certain analytical, no rotation of the chain.

Keywords: mechanical transmission; wave transmission; bushing-roller chain; kinematics.

80 %, 80. [8, 9], [10], [11, 12]. [13], [14]. [15] «SIMACO» [16]. [17] $i = 80 \dots 320$.

3 4.

3D FDM –

[18]

FDM

3D

[18]

[4]:

$z_2 = 12;$

$d = 16 ;$

$b_1 = 10 ;$

$b = 20 ;$

$t = 32 ;$

$b = 3 ;$

$z_{3,4} = 14;$

$z_{5,6} = 12;$

[4].

$d_{3,4} = 103,5 ;$

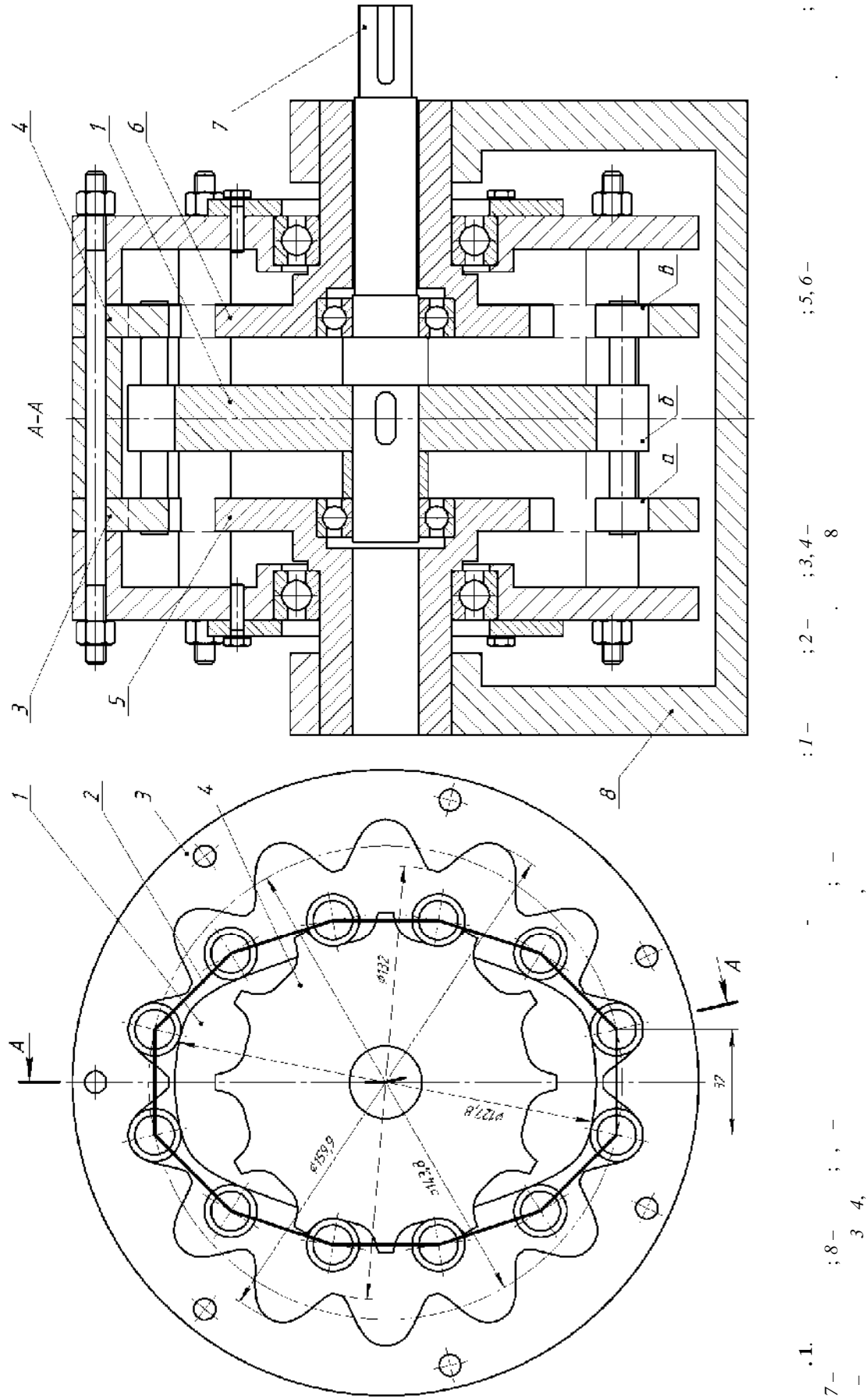
$d_{a3,4} = 103,5 ;$

$d_{f3,4} = 87,6 ;$

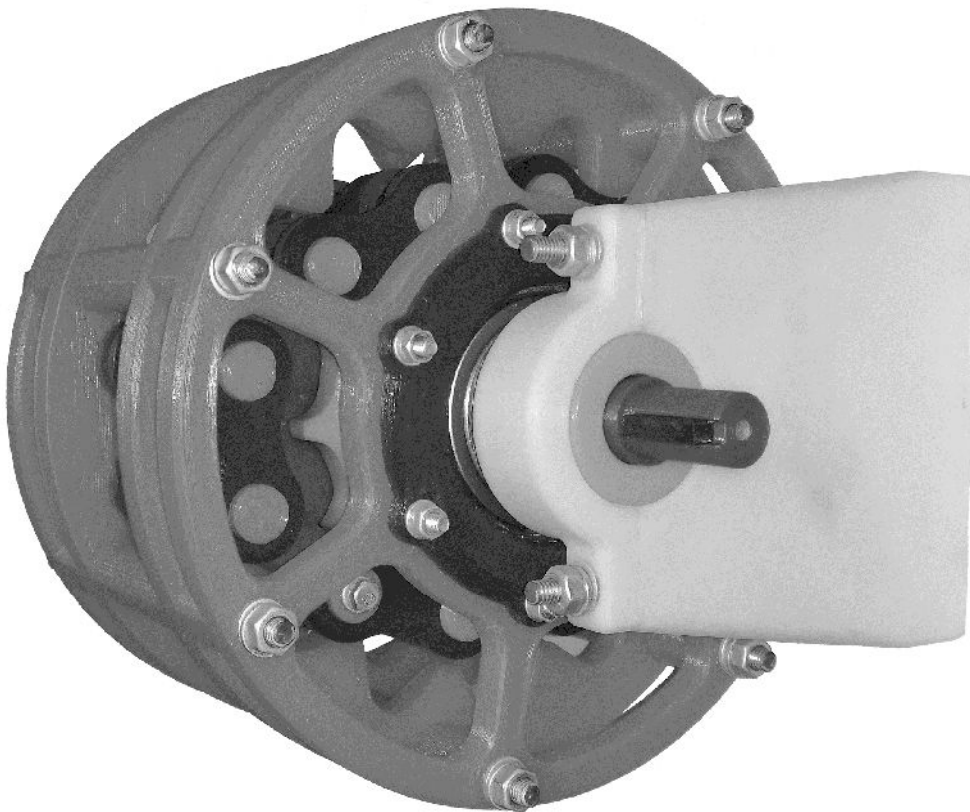
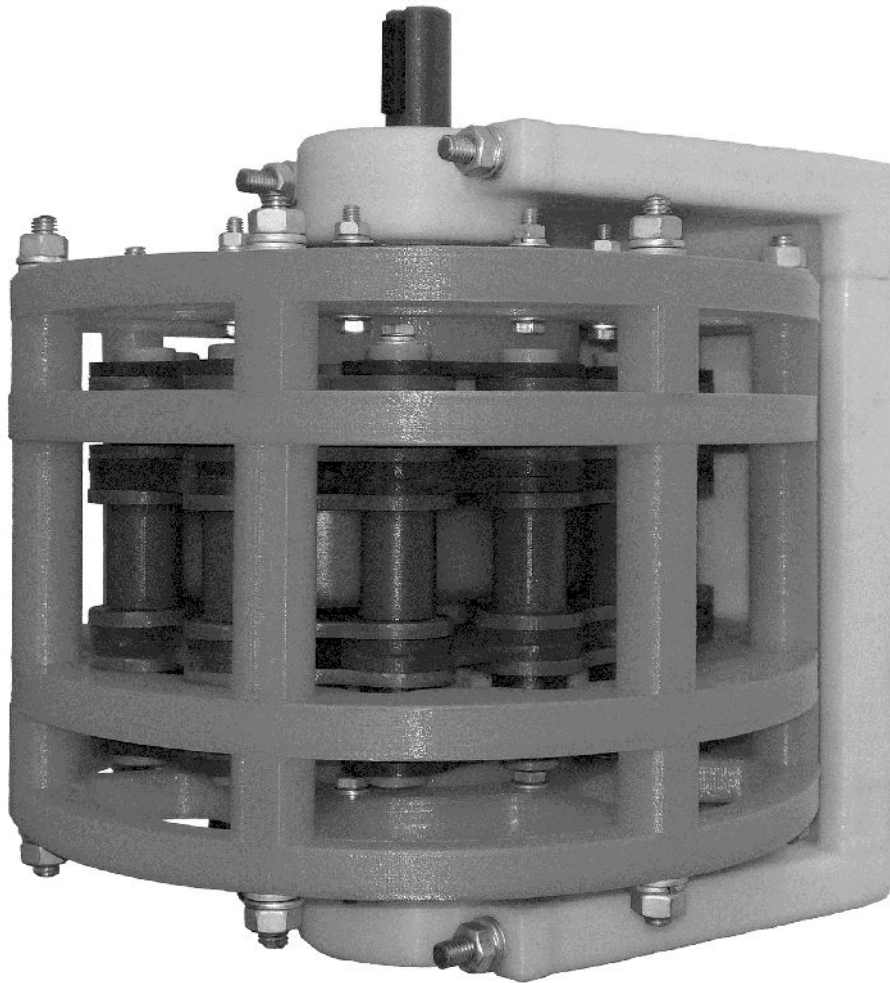
$i = \frac{z_3}{z_3 - z_2} = \frac{14}{14 - 12} = 7. \quad (1)$

$i = \frac{z_2}{2} = \frac{12}{2} = 6. \quad (2)$

5 6,



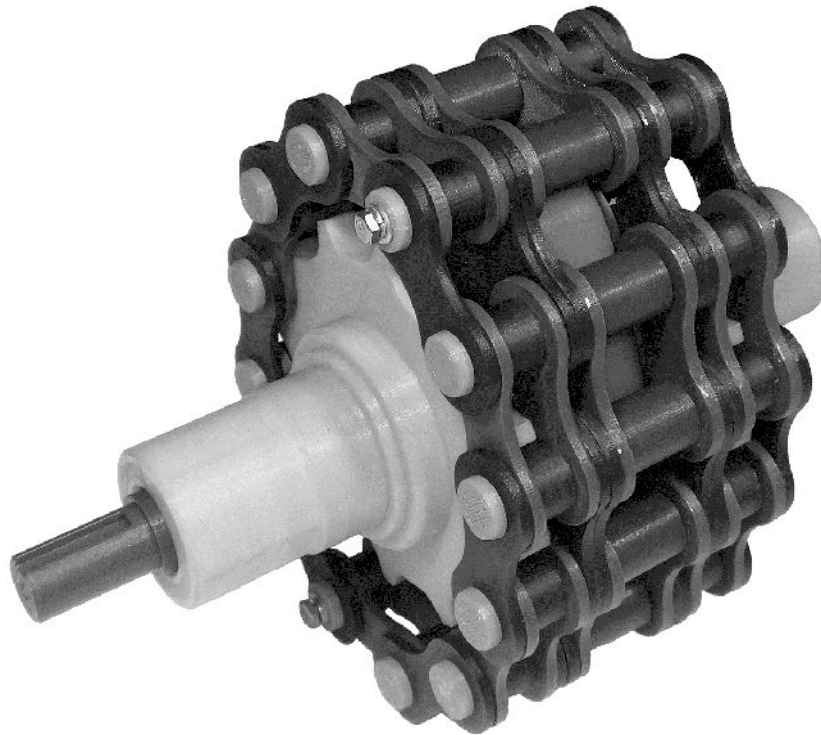
.1. ; 8- ; , - ; - ; 3 4, ; 1- ; 2- ; 3, 4- 8 ; 5, 6-



.2.



.3.



.4.

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[4]

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