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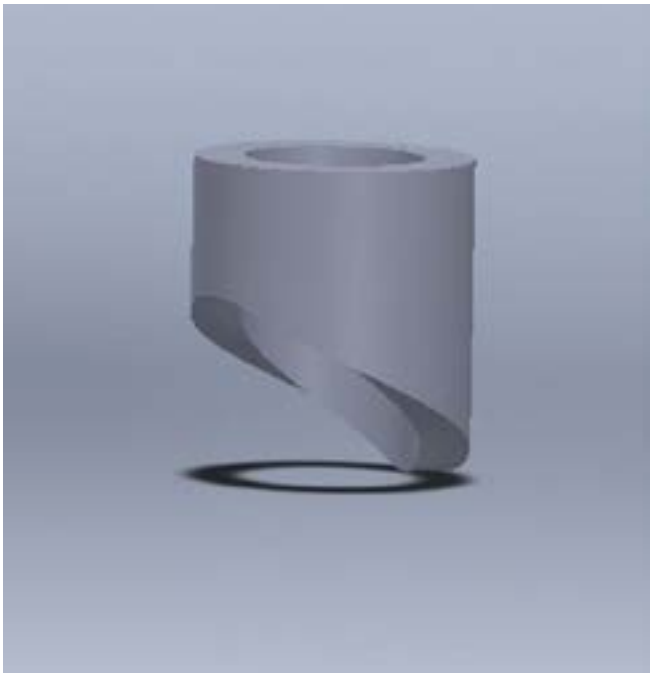
STUDY AND DESIGN OF AXIAL CAM OF 8-NEEDLE HEAD FOR KNITTED CORD

Angel Atanasov Mladenov and Ivelin Rahnev
SWU Neofit Rilski – Blagoevgrad, Bulgaria
E. Miroglio EAD, Industrial District, 8800 Sliven, Bulgaria
Ivelin.Rahnev@emiroglio.com



The knitting head for cords is a miniature version of a circular knitting machine. The consistent and regulated axial movement of the knitting needles is due to the profile of the axial cams and their smooth surface.

The seemingly simple sinusoidal trajectory of the axial cam for driving the knitting needles turns out to be a complex spatial surface. The drive and control of the needles is carried out by direct contact between the guide of each needle and the opposing surfaces of the cams.

During the rotation of the cams, the knitting needle guides experience two types of forces that can only be considered as mechanical action from the cam mechanism.

On the one hand, there is the tight contact between the needle guide and the cam guide surface. As a result of the contact, the rotary movement of the cam causes the linear axial movement of the needle. The bearing between the cam and the needle guide is carried out by friction. Insufficient smoothness of the two surfaces will cause additional friction forces. A reduced contact surface will cause abrasion of the two surfaces, more on the less resistant one.

On the other hand, the second type of effort is due to the distance between the two cam surfaces. This is the width of the channel in which the needle guide moves. The width of the channel must exclude pressure and friction between the guiding surfaces of the cams and the needle guides. Conversely, clearances in the cam groove can cause oscillations and vibrations in the axial movement of the needles.

The conditions considered thus impose the following requirements on the axial cams: solid material, smooth surface, and perpendicularity of the leading surface to the axis of rotation.

The subject of this article is a design of axial cams for circular knitting of cords with 8 or 12 needles. Purpose of the development consists in determining the numerical values of the guide profile with the additional condition that the movement of the knitting needles is carried out by the guide profiles of paired mirror axial cams.