Int. Agrophysics, 1998, 12, 231-232

METHOD OF SOLUTION OF CAM MECHANISM OF COUNTER-ROTATING CUTTER BAR (a short communication)*

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Accepted January 12, 1998

A b s t r a c t. The author describes the principle of a cutting device with counter rotating cutter bars including cam mechanism. The course of contact force, between the cam surface and roller of the bar is investigated by means of an analogous computer to set up a dynamic model of the drive mechanism and chosen shape of cam.

The results of the course of the contact force at the angle of cam rotation = 0-180° and for the revolutions of the cam shaft n = 400 r.p.m.. In conclusion cam mechanism a design is introduced and the results of testing of a functional model of a counter-rotating cutter bar are demonstrated.

K e y w o r d s: cam mechanism, counter-rotating cutter

Among the principles of the drive of the machines for mowing of fodder crop is also a counter rotating scythe bar using two cams mutually turned through an angle of 90°. This type of the drive was used for the construction of a counter rotating PK 700 cutter bar. The developement of this drive was realized by the author at the Technical Education Department of University of Education in Hradec Kralove, Czech Republic.

Figure 1 shows the drive of counter rotated bar. The working parts of the cutter bar are two scythes.

Both scythes have on one side a roller with a beam into which are fixed springs . The lift of each of the scythes is realized by a cam and two tension springs. Scythe 1 is for example driven by cam 6 and reverse movement is realised by two tension springs 4, 5. In these springs is accumulated energy from the previous direction of movement. Both cams are of the same shape and are mutually turned through an angle of 90°.

Stable contact of the designed scythe roller bar and cam during mowing is necessary for proper functioning. This is achieved by two tension springs which must exceed frictional and cutting resistance, including the inertial force of the scythe. The dynamical solution of the proposed mechanism was elaborated on analog computer. As a result of the cam shape and parameters of the tension springs optimal parameters for the cutting mechanism were ascertained for the proposed drive construction. The differential equation describing the model of the cutting gear mechanism was solved on an analogous computer. As a result of the offered solution both the working conditions of the scythe

* Paper presented at 6 ICA

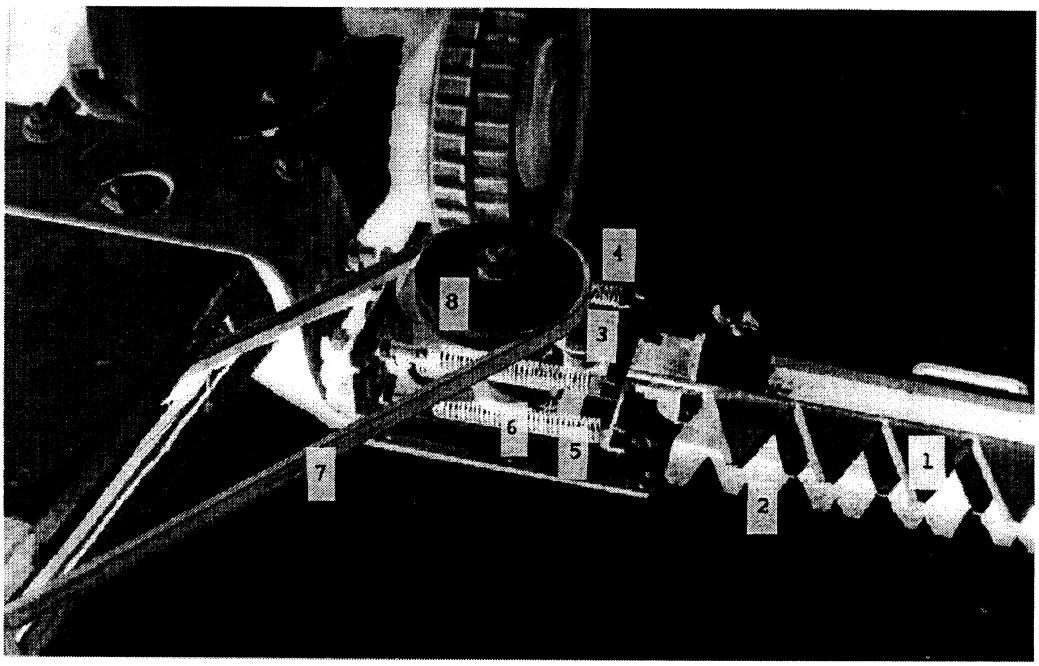

Fig. 1. Drive of counter rotated bar: 1,2-scythe, 3-roller, 4,5-springs, 6-cam, 7-vee belt, 8-V belt pulley.

and solution of the construction of the mechanism were optimized.

Testing of the cutting bar PK 700 model was successfull and confirmed the proper function of the offered mechanism according to the author's design. The construction used other original technical solutions enabling good working of the cutting bar.

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