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INSTRUMENT FOR TWO-SPEED OPTOKINETIC STIMULATION

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Translation of "Pribor dlya dvukhskorostnoy optokineticheskoy stimulyatsii," Zhurnal ushnykh, nosovykh i gorlovykh bolezney, No. 3, 1980, pp. 78-79

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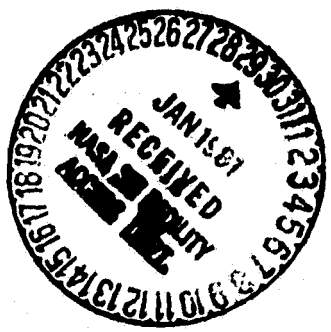

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16. Abstract This article presents a description of a device for providing optokinetic stimulation. The device has the advantages of being small, simple in design, permits automatic operation in four directions (up, down, left, right) at two drum speeds, and has a screened chamber allowing polygraphic recording of optokinetic reactions by EEG.

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INSTRUMENT FOR TWO-SPEED OPTOKINETIC STIMULATION

I. F. Kandaurov, L. A. Shestak, Yu. A. Kuvshinov*

In order to obtain optokinetic stimuli instruments have been /78** suggested of different design that make it possible by manual or automatic method to implement dosed optokinetic stimulation by rotation of a cylinder in front of the subject's eyes; alternating black and white bands are applied to the outer surface of the cylinder (S. Ya. Gol'din, 1951; I. A. Sklyut, 1956; V. P. Neverov, 1966). The given technique became most widespread in clinical practice and is being continually improved (Ye. A. Kupryashkin, 1971; G. M. Gashimov, 1976).

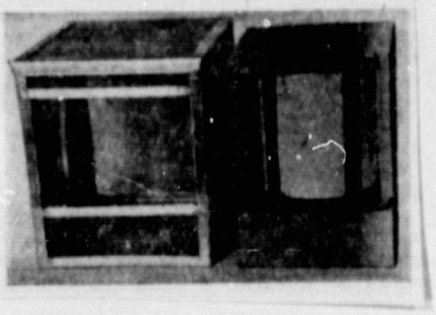

Figure 1. Instrument for Two-Speed Optokinetic Stimulation

Without denying the merits of the devices suggested by different authors for the production of optokinetic stimulation by

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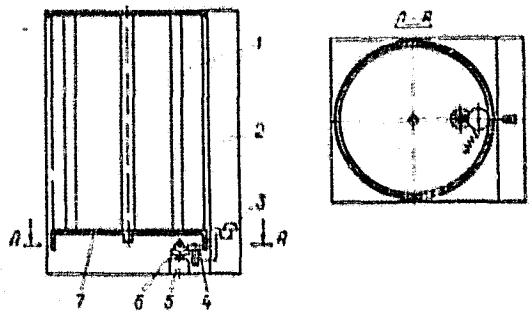

Figure 2. Plan of Instrument for Dosed Optokinetic Stimulation. 1--drum; 2--housing; 3--drum rotation speed switch; 4--idle roller; 5--electric motor; 6--driving step axle; 7--disk.

the method indicated above, we suggest an instrument that is simple in its design, small-sized, permits automatic optokinetic stimulation in all directions (to the right, to the left, upwards and downwards), and has two speeds of drum rotation, and a screened chamber which makes it possible to study the optokinetic nystagmus under normal conditions and under conditions of a screened chamber when polygraphic recording of the optokinetic reaction is done by electroencephalograph (fig. 1).

The drum is 200 mm in diameter, 250 mm high. Five black vertical bands 25 mm wide that are separated from each other by the same distance are applied to the white surface of the drum. The drum is rigidly secured to disk 7 (fig. 2), and through idle roller 4 and driving step axle 6 is moved by electric motor 5 (fig. 3).

The instrument is screened and grounded which permits it to be used under conditions of a screened chamber when polygraphic recording of the optokinetic reaction is conducted by electroencephalograph. When the instrument is in a vertical position the drum is rotated to the right and to the left, and in the horizontal position--up and down. The rotation rate of the drum is 90 and 198°/s, while the rate of optokinetic stimulation is 75 and 165 bands per minute.

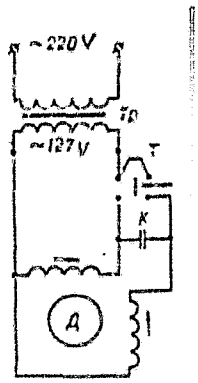

Figure 3. Plan of Reverse Rotation of Electric Motor EDG-4

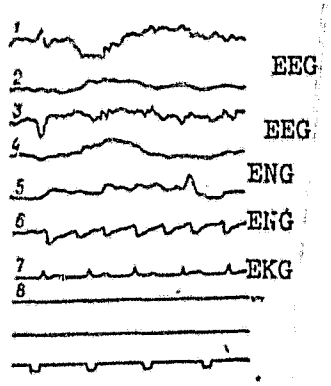

Figure 4. Fragment of Polygraphic Recording of Optokinetic Reaction in Healthy Person (Optokinetic Stimulation in Horizontal Plane, Rate of Drum Rotation 198°/s.
On sixth channel, rhythmic, regularly shaped, triangular oscillations were recorded in a horizontal plane; the 1-4 channels reflect the bilateral-synchronous values of the biopotentials of the temporal-frontal-occipital regions of the brain; 7th channel--EKG

During the study the apparatus is installed at the subject's eye level, at a distance of 600-700 mm. Nystagmus is induced to the right, to the left,upwards and downwards for 10 s, and has a direction that is the opposite to the drum rotation.

The optokinetic nystagmus (fig. 4) is electrographically recorded in the form of rhythmic, regularly shaped triangular oscillations on which a flatter section corresponding to the slow phase is clearly visible.

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