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THE EFFECT OF MECHANICAL VIBRATION ON KINETIC FRICTION

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ABSTRACT

This thesis presents the effect of mechanical vibration on kinetic friction between certain metals. Tests were carried out in which 3/4 in. diameter brass slider was rubbing on a 6 in. diameter steel ring. The brass slider was vibrated by a vibrator at a frequency range from 700 to 2500 c/s. The three different directions of vibration were as follows.

(1) The direction of vibration of the slider perpendicular to the sliding surface in a plane at right angles.

(2) The direction of vibration of the slider parallel to the sliding surface.

(3) The direction of vibration of the slider perpendicular to the direction of sliding in the same plane.

Considerable reductions of frictional force at low linear speeds in the order of 0 to 300 ft/min were observed.

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LIST OF SYMBOLS

A, a	Area
e	Base of natural logarithm
F	Force
k	Linear spring stiffness
m	Mass
P	Deformation
S	Shear force
t	Time
V	Voltage
v	Velocity
w	Angular frequency
w_n	Natural frequency
W	Load
X, x, Y, y	Rectangular coordinate
$\dot{x}$	Rectilinear velocity
$\ddot{x}$	Rectilinear acceleration
μ	Coefficient of friction
μ_s	Static coefficient of friction
μ_K	Kinetic coefficient of friction
Ω	Ohm
α	A constant

ABBREVIATIONS

cm	Centimetre
c/s	Cycle per second
ft/min	Foot per minute
in.	Inch
lb	Pound
rev/min	Revolution per minute