

Date: December 11, 2020

To whom it may concern:

This is to certify that the attached translation from Russian and into English is an accurate representation of the documents received by this office.

The document is designated as:

Certified copy of the document that is entitled "Влияние магнитной стимуляции на силовые возможности скелетных мышц" in Russian and "EFFECT OF MAGNETIC STIMULATION ON THE STRENGTH CAPACITY OF SKELETAL MUSCLES" in English.

Taylor Liff, Project Manager in this company, attests to the following:

"To the best of my knowledge, the aforementioned documents are a true, full and accurate translation of the specified documents."

Signature of Taylor Liff

61 15-3/374

FEDERAL STATE BUDGETARY EDUCATIONAL INSTITUTION OF HIGHER PROFESSIONAL EDUCATION "VELIKIYE LUKI STATE ACADEMY OF PHYSICAL CULTURE AND SPORT"

As manuscript

[Signature]

ANDREY GENNADIEVICH BELYAEV

EFFECT OF MAGNETIC STIMULATION ON THE STRENGTH CAPACITY OF SKELETAL MUSCLES

03/03/01 - physiology

Thesis for

PhD in Biological Sciences

The copy is authentic to the original.

Academic secretary of the Russian State Library

December 10, 2020 [Signature] Ivanova Ye.A. Seal affixed

DOCKE

Δ

Doctoral advisor

Doctor of Biological Sciences,

Professor R.M. Gorodnichev

Velikiye Luki - 2015

Find authenticated court documents without watermarks at docketalarm.com.

TABLE OF CONTENTS

INTRODUCTION4
CHAPTER 1. LITERATURE REVIEW9
1.1. General description of muscle strength9
1.2. Methods to develop muscle strength
1.3. Magnetic stimulation in human research
CHAPTER 2. ORGANIZATION AND RESEARCH METHODS
2.1. Population and research organization
2.2. Research methods
2.3. Recording of electromyographic parameters during experiment
2.4. Mathematical statistics methods
CHAPTER 3. ASPECTS OF INDUCED MUSCLE RESPONSES IN MAGNETIC AND ELECTRIC STIMULATION OF PERIPHERAL NERVE
3.1. Changes in parameters of induced muscle responses with an increase in strength with a single magnetic and electrical stimulation of n. tibialis
3.2. Changes in the magnitude of torque with an increase in frequency and intensity of rhythmic stimulation effects
3.3. Effect of magnetic stimulation on the impulse activity of individual motor units of m. gastrocnemius
CHAPTER 4. EFFECT OF MAGNETIC STIMULATION ON THE STRENGTH OF SKELETAL MUSCLES
4.1. Changes in muscle strength parameters with magnetic stimulation of muscles
4.2. Dynamics of muscle strength after termination of magnetostimulation training
CHAPTER 5. RESULTS DISCUSSION
FINDINGS
PRACTICAL RECOMMENDATIONS91
LIST OF REFERENCES92

DOCKET A L A R M Find authenticated court documents without watermarks at <u>docketalarm.com</u>.

ABBREVIATIONS

- ATP adenosine triphosphate;
- IMR induced motor response;
- MU motor unit;
- MT maximum torque;
- MP motor pool;
- MVS maximum voluntary strength;
- MS magnetic stimulation;
- RNA ribonucleic acid;
- STH somatotropic hormone;
- T teslas;
- CNS central nervous system;
- EMG electromyogram;
- EMS electromyostimulation;
- ES electrical stimulation;
- GM gastrocnemius muscle;
- SOL soleus muscle;

Δ

TA - tibialis anterior muscle.

INTRODUCTION

Research relevance. Strength capacity of the human allows for targeted manipulation of the environment and adaptation of the human body to various living conditions at all stages of postnatal ontogenesis (A.N. Vorob'yev, 1989; M.L. Foss, S.J. Keteyian, 2008; A.V. Samsonova, 2011; A.A. Chelnokov, 2014). Strength capacity is of particular importance in sports, since the results in a number of sports are largely determined by the strength capacity of the athlete (V.M. Zatsiorskiy, 2009; A.I. Netreba et al., 2011).

To date, extensive experimental material has been accumulated on the effectiveness of various methods and approaches to the development of strength capacity in humans (B.S. Shenkman et al., 2006; M.N. Stone et al., 2007; V.E. Chursinov, 2011; O.L. Vinogradova et al., 2014). There is information about the physiological mechanisms underlying the development of skeletal muscle strength (R.M. Enoka, 1988; Yu.V. Koryagina, 2003; R.M. Gorodnichev, 2005; B.R. Macintosh et al., 2006; J. Gondin et al., 2014).

A number of studies are devoted to the development of unconventional methods to increase strength capacity (I.P. Ratov, 1979; V.G. Fedorov, 2010; G. Attene et al., 2014), among which the most comprehensively described are methodological approaches to the development of skeletal muscle strength by electrostimulation at rest and during activities requiring muscle activation (Ya.M. Kots, 1971; G.F. Kolesnikov, 1977; A.A. Nikolaev, 1999; J. Gondin et al., 2005; U. Doermann et al., 2011).

Electrostimulation muscle strength training has some limitations associated with pain and discomfort,

DOCKET



Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time** alerts and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.

