**ОДЕСЬКА НАЦІОНАЛЬНА АКАДЕМІЯ
ХАРЧОВИХ ТЕХНОЛОГІЙ**

ЗБІРНИК
НАУКОВИХ ПРАЦЬ
МОЛОДИХ УЧЕНИХ, АСПІРАНТІВ ТА СТУДЕНТІВ

**ОДЕСА
2016**

ББК 36.81 + 36.82
УДК 663 / 664

Одеська національна академія харчових технологій
Збірник наукових праць молодих учених, аспірантів та студентів
Міністерство освіти і науки України. – Одеса: 2016. – 408 с.

Збірник опубліковано за рішенням вченої ради від 01.07.2016 р., протокол № 12
За достовірність інформації відповідає автор публікації

ISBN 966-571-063-х

РОЗДІЛ 2

ХІМІЧНІ, ФІЗИЧНІ ТА МАТЕМАТИЧНІ МЕТОДИ ДОСЛІДЖЕННЯ ПРОЦЕСІВ ТА АПАРАТІВ

In conclusion, it can be said, that the modernization of access networks should be configured to ensure the development of info-communication system in the era of NGN, and even post-NGN. The main requirements of the process to access the network – bandwidth, high reliability, good quality of data transmission while reducing operator costs.

Scientific Supervisor – PhD Sakharova S.V.

Literature

1. Sokolov NA Telecommunication networks. Chapter 2.Publishing Alvarez 2003.
2. Goldstein BS Switching Systems. – SPb .: BHV 2003.
3. ITU-T. Framework Recommendation on functional access networks. Architecture and functions, access types, management and service node aspects. Recommendation G.902 – Geneva. 1995.

TO THE QUESTION OF REDETERMINATION OF FRICTION MODEL IN THE ROTATIONAL PAIR

Branspiz E.V., Branspiz M.Y.,
Institute of engineering mechanics
Lugansk State University named after V. Dahl, Lugansk

Modern equipment for food production contains a lot of different mechanisms, kinematic pairs of which are pairs with friction. The article examines accordingly the rotational pair with radial loads according to the traditional scheme. For this pair in the case, when it's surfaces are not fastened, there is a well-known mathematical model, which connects proportionally the rotational moment with the load Q. At the same time the coefficient of proportionality is calculated taking into consideration that the area of contact of friction covers a semicircle of the cylindrical body of the pair with radius R. However, taking into consideration that bodies of the rotational pair are made with appropriate tolerances, the real area of a contact is less than a specified one. Namely, it represents a zone, which forms as the result of the appropriate prognoplastic deformations, and therefore its size depends on the total load and neither is permanent. Taking this into consideration, the article solves the problem of working out of refined models of friction in the rotational pair with redetermination of size of the friction zone.

For this was supposed the condition, that the cylindrical body of the pair that is considered, has no vertical displacement, and the load Q must be balanced with reaction forces in the contact zone. If we accept that in this area elastic-plastic deformations takes place, it can be also supposed that the pressure between the elements of rotational pair is approximately equal to hardness by Brinell HB. This allows to obtain the following expression for calculating of the angular size of the contact zone $\arcsin\left(Q\cdot(HB\cdot R\cdot\ell)^{-1}\right)$, according to which the moment of friction forces for the problem, which is considered, can be calculated as

$$M = k\cdot Q\cdot R\cdot\arcsin\left(Q\cdot(HB\cdot R\cdot\ell)^{-1}\right),$$

which gives for the mentioned coefficient of friction k' such calculation expression

$$k' = k\cdot\arcsin\left(Q\cdot(HB\cdot R\cdot\ell)^{-1}\right),$$

where k — the coefficient of friction between the elements of rotational pair;

ℓ — the axial length of the contact surface.

Thus, the mentioned expressions take into consideration the influence of load on the size of zone of friction in the rotational pair with radial loads.

Scientific supervisor – DSc, Associate Professor E.V. Branspiz

Literature
1. Машины-автоматы и автоматические линии пищевой промышленности. Основы теории и расчёта. Под общей ред. В.Я. Белецкого. - К.: Техника, 1967. – 167 с.
2. Машины и аппараты пищевых производств. В 2 кн.: Учеб. для вузов / Под ред. В.А. Панфилова. – М.: Высш. шк., 2001. – 703 с.
3. Артоболевский И.И. Теория механизмов и машин: Учеб. для вузов. – 4-е изд., перераб. и доп. – М.: Наука. Гл. ред. физ.-мат. лит., 1988. – 640 с.

ABOUT APPLICATION OF ELECTROMAGNETIC PULLY FOR MAGNETIC SEPARATION OF GRAIN AND GRAIN MIXTURE

Branspiz E.V., Branspiz M.Y., Institute of engineering mechanics
Lugansk State University named after V. Dahl, Lugansk

One of the important stages of technological processing of grain and grain mixtures at the food industry factories is their purification from metallic admixture with special devices – magnetic separators. Nowadays for this purpose magnetic slabs and barrel-separators with permanent magnets, and also barrel-separators with electromagnetic excitation are mainly used. Modern electrotechnical industry, however, produces a wider range of types of separators with permanent magnets as well as types of separators with electromagnetic excitation of the magnetic field. In particular, a large group of magnetic separators, which home and foreign industry produce, form pulley magnetic separators.

The article considers pulley magnetic separators with electromagnetic excitation of the magnetic field (electromagnetic pulleys). Based on the analysis of the characteristics of their design (circular cylindrical coil with a current in the armor with a gap on the outer side – the interpolar gap) it is shown that using of these separators as magnetic separators of grain and grain mixtures has a number of advantages comparing to the separators, which are used at food industry factories:

— the ability to provide a longer staying of a cleaned stream in the intensive magnetic field of the separator, which increases the efficiency of extraction of metal bodies;

— the ability to generate more intensive magnetic field by reducing of magnetic fluxes of dispersion, which let to increase the productivity of magnetic separator;

— the ability to variate the dimensions of the electromagnetic system (outer dimensions) in a wide range, which allows more fully to consider the requirements of production, thereby increasing the competitiveness of separators.

Analysis of the mentioned benefits of magnetic separators of grain and grain mixtures with electromagnetic pulleys allowed to formulate the main problems for engineering working out of such separators (grounds of construction, its engineering and calculation). It is shown that the solving of appropriate engineering and calculation problems is greatly simplified by using of block-type of production of electromagnetic pulleys – multipole electromagnetic pulleys with electromagnetic sections on the same shaft (multipole electromagnetic pulleys).

Scientific supervisor – DSc, Associate Professor E.V. Branspiz

Literature
1. Машины и аппараты пищевых производств. В 2 кн.:Учеб. для вузов/ Под ред. В.А. Панфилова. – М.: Высш. шк.,2001. – 703 с.
2. Артоболевский И.И. Теория механизмов и машин: Учеб. для вузов. – 4-е изд., перераб. и доп. – М.: Наука. Гл. ред. физ.-мат. лит., 1988. – 640 с.

Наукове видання

Збірник наукових праць молодих учених, аспірантів та студентів

Головний редактор, д-р техн. наук. Б.В.Єгоров
Заст. головного редактора, д-р техн. наук. Л.В.Капрельянц
Заст. головного редактора, канд. техн. наук Н.М. Поварова
Відповідальний редактор, д-р техн. наук. Г.М. Станкевич

Підписано до друку 2016 р. Формат 60×84/8. Папір офсетний.
Ум. друк. арк. 47,4. Тираж 30 прим. Замовлення