When the road surface is very hot, the upper thermostat valve is closed, the lower one is open. In this case, most of the liquid enters the radiator, is cooled in it, and then through the pipelines and through the open bottom valve of the thermostat enters the pump. A radiator is a heat exchanger in which heat is transferred to a liquid by an air stream.

The thermostat is an automatic valve that accelerates the heating of the frozen roadway and regulates, within certain limits, the amount of liquid passing through the radiator and the SC panel. It is installed at the outlet of the liquid (heat carrier) from the SC. A thermostat with a solid filler, a mixture of cerazine (oil truck), with copper powder, has a stem that is connected by a rocker with a damper (valve). When the road surface needs to be warmed up, the damper is open and the coolant (heat carrier) does not enter the radiator. When cerazine is heated, it melts, its volume increases, and by moving the stem, the valve opens. The liquid begins to circulate through the radiator (large circulation circle). Thus, as a result of the forced circulation of the anti-freezing agent through the SC with the trap, the road surface is heated or cooled. The technical result is an increase in efficiency, reliability and independence from power sources.

[1] RF patent №2114240, class. C 1/6 E 01, C 11/26, 31.01 1997
[2] Japanese patent No. 55-19322, cl. E 01, C 11/26, publ. 1980
[3] RF patent No. 2060316, class. C1, 6 E 01, C 11/24, E 01, D 19/22 J 3/00 01/20/1999
[4] https: //findpatent.ru/img_show/8361976.html
[5] Salamov O.M., Garibov A.A. Salmanova F.A. Heat trap flat solar collector. Patent of the Republic of Azerbaijan, I 2014 0081, AR SM and PDK, 31.03.2014
[6] Salamov O.M., Hasanov V.H. Heat trap flat solar collector. Patent of the Republic of Azerbaijan No. I 2015 0087, AR SM and PDK, 16.12.2015

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SIMULATION MODELING OF THE AUTOMOBILE BRAKING SYSTEM PERFORMANCE

G. Viselga[1], D.Sc. (Tech.), Ev. Ugnenko[2], D.Sc. (Tech.),
E. Uzhviieva[2], PhD (Tech.), O. Tymchenko[2], PhD (Tech.), N. Sorochuk [2]
[1]Vilnius Gediminas Technical University, Lithuania
[2]Ukrainian State University of Railway Transport (Kharkiv)

Traffic participators' safety relies heavily on effectiveness of vehicle braking system. Thus, braking system design is essential when designing a new vehicle. Modeling of the functionality of the designed system is one of the most important phases of design. Time and material expenses for imitational modeling are always less than actually producing maquettes and conducting experiments on them. Experiments should prove theoretical abstracts stated while modeling. Thus, the imitational model should be well designed and adequate [1].

When modeling a braking system, one should synthesize the synergy between different physical elements and systems – the linear and rotational movement of mechanical parts, the work of hydraulic system and its synergy with brake fluid, automatic electric control circuits based on microcontrollers [1].

MatLab allows to synthesize such imitational models with good accuracy and fast speed of experiment conducting. The developer of such a model can optimize the

algorithm functionality of braking system operation, optimize braking system elements' characteristics and use the imitational model as an observing system to detect perturbations in automatic control system functionality on live objects.

The aim of the presented work is minimization of time and material expenditures on designing a braking system using imitational modeling of the system, conducting experiments to optimize the algorithm of the automatic control of the designed braking system and its characteristics [2].

Imitational model can demonstration operation of the braking system in different modes and dynamics of the movement of the mechanical parts and thermal processes during braking, and measurement error, and the visibility of the algorithm of the brake system. Imitational model allow operator optimize parameters systems of control and operator can change parameters model braking system and parameters system of control of braking system in time work model [2].

Imitational model will connect to the stand with the mechanical part of the brake system for optimize parameters system of control and algorithms works braking system. System observation of system of control can determine external and internal disturbances of braking system. Imitational model allow efficient operation of brake system with different system of control.

[1] Деревянко В.А. Тормозные системы легковых автомобилей / В.А. Деревянко. – М.: Петит, – 248 с. (2001).
[2] Дж. Дэбни, Т. Харман Simulink 4. Секреты мастерства / Дэбни Дж., Харман. Т. – М.: Бином. Лаборатория знаний,– 404 с. (2003).

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ДОСЛІДЖЕННЯ ВПЛИВУ КОНЦЕНТРАЦІЇ РІДКОКРИСТАЛІЧНОЇ ПРИСАДКИ НА ТРИБОЛОГІЧНІ ВЛАСТИВОСТІ ІНДУСТРІАЛЬНИХ ОЛИВ

RESEARCH INTO EFFECT OF CONCENTRATION OF LIQUID-CRYSTAL ADDITIVES ON TRIBOLOGICAL BEHAVIOR OF INDUSTRIAL OILS

Н.М. Аношкіна, О.С. Харківський
Український державний університет залізничного транспорту (м. Харків)

N.M. Anoshkina, O.S. Kharkovsky
Ukrainian State University of Railway Transport (Kharkiv)

Індустріальна олива є дуже розповсюдженим мастилом для вузлів сучасної промислової техніки. Цей тип олив має відносно низьку ціну, але має істотний недолік - низька мастильна здатність. Такий недолік обумовлюється відсутністю ефективних функціональних присадок. Тож перспективним напрямком досліджень є пошук відносно дешевих присадок які могли б покращити антифрикційні та протизносні властивості даних олив.

Ми провели пошук таких присадок серед речовин, які здатні утворювати холестеричні рідкокристалічні фази [1]. Обрана нами рідкокристалічна присадка відноситься до групи терпенів. У структурі своєї молекули вона має фенантреновий скелет. Фенантрен і його похідні рис. 1 представляють собою трициклічні ароматичні вуглеводні [2]. Похідні фенантрену широко поширені в