References

1. Королев А.А.Новые исследования деформации металла при прокатке / А.А. Королев. – М.: Манегиз, 1953. – 206 с.

2. Хейн А.Я.Процесс ленточной и тонколистовой прокатки / А.Я.Хейн. – М.: Металлургиздат, 1941. – 247 с.

3. Василев Я.Д. Теория продольной прокатки / Я.Д.Василев, А.А.Минаев. – Донецк.: УНИТЕХ, 2010. – 455 с.

4. Целиков А.И.Расчет усилий в прокатных станах / А.И.Целиков. – М.: Металлургиздат, 1962. – 494 с.

5. Смирнов В.С.Теория прокатки / В.С.Смирнов. – М.: Металлургия, 1967. – 460 с.

6. Максименко О.П., Лобойко Д.И., Измайлова М.К. Продольная устойчивость в валках с анализом контактных условий: монография / О.П.Максименко, Д.И.Лобойко, М.К.Измайлова. – Днепродзержинск: ДДТУ, 2016. – 212 с.

7. Максименко О.П. Анализ силового взаимодействия в очаге деформации при прокатке / О.П.Максименко, Д.И.Лобойко, Р.Я.Романюк // Металлургическая и горнорудная промышленность. – 2013. – №6. – С. 47-49.

8. Грудев А.П. Захватывающая способность прокатных валков / А.П.Грудев. – М.: СП Интермет Инжиниринг, 1998. – 283 с.

9. Чекмарев А.П. Экспериментальное исследование максимальных углов захвата при установившемся процессе прокатки / А.П.Чекмарев, В.И.Прокофьев, В.П.Галицкий и др. // Обработка металлов давлением: Научные труды, ДМеТи. – М.: Металлургия. – 1967. – Выпуск LII. – С. 79-88.

10. Максименко О.П. Продольная устойчивость процесса прокатки с натяжением полосы при двухзвенной модели трения в очаге деформации / О.П.Максименко, М.К.Измайлова, Д.И.Лобойко // Металлургическая и горнорудная промышленность. – 2015. – №4. – С. 73-76.

DYNAMIC PROCESSES IN LONG-STROKE PUMPING SET FOR BOOTY OF PETROLEUM-OIL

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Purpose. Researching of twowave dynamic processes in a rope hauling organ and of the lifted mixture of oil, water, gas and soil in the steel pipeline of plunger long-stroke pump for the booty of oil.

Methodology. Mathematical model of dynamic processes is resulted in a resilient lifting rope with a load on a lower end at the set and harmonic change the rate of movement of overhead end the rope with account of vibrations of the lifting

material. The analytical solution of problem is executed, is analysed maximal efforts in the hauling organ of setting length of rope, his mechanical parameters, height of mixture in a pipe, its parameters and the set harmonic motion of overhead end of rope, that corresponds the real conditions of work of the pumping setting. The got solution allows to probe the different modes of operations of the pumping setting depending on the period of change of speed of overhead end of rope and parameters of the pumping setting.

Work is executed without financing on the private initiative.

Key word: vibrations, mathematical model, longitudinal vibrations, rope with a load on the end, motion on the harmonic law of overhead end of rope

References
1. Савин Г.Н., Горошко О.А.(1962) Динамика нити переменной длины. Наук. думка, Киев, 332 с.

RIGIDITY OF ELASTIC SHELL OF RUBBER-CABLE BELT DURING CABLE DISPLACEMENT

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Purpose. Establishment of a character of the influence of geometric parameters on shear rigidity, determination of maximum stresses in a layer of elastic shell located between the cables and the drum, and development of an algorithm for determination of shear rigidity of rubber-cable rope (belt) shell relatively to the driving drum. Determination of a lower boundary of the efficiency coefficient in a process of interaction of the rubber-cable rope (belt) with sheaves and drums, that are driving and driven, lined with elastic materials and with hard operating surfaces.

Methodology. Construction of a model, determination of a stressed state of the elastic material of a deformed shape located between the cables and the drum on the shear of cables relatively to the drum by the methods of linear theory of elasticity. Establishment of analytical dependencies of rigidity and parameters of a stress-strained state of a layer of rubber located between cables and a drum from the shear of cables relatively to the drum in a closed form.

Findings. Dependencies for determining the rigidity and parameters of a stress-strain state of a rubber layer located between the cables and the drum from their mutual shear, the method of determining the dispersion of deviation of calculated displacements from the given. Obtained results allow considering the shape of an elastic layer, the level of reliability of the results when calculating the stress-strain state of rubber-cable tractive elements from the shear of cables relatively to the