

shaft due to male stud. There are switchers of travers on the saddle. Moving saddle is named traverse.

The most important thing for turning lathe is to keep a certain speed in a certain period of time. Mostly stable capacity is needed when we work with high speed and stability of moment is needed when we work with low speeds. There is much to gain from variate speed arrange from the relation 80:1 to 100:1.

Let's speak about development of drives. Do you know when people began making lathe? The most people suggest that it's near about 2 centuries ago but it's false. The first reminder was made by ancient Egyptians. For sure, that lathe doesn't look like modern. Construction is primitive. One man turns the detail and another hold on cutter. After that people realize that it's not profitable when two people work on one lathe/ this way, people made the second lathe with pedal drive. The most serious drawback is that you can't use these lathes for metal details. The solution was made by Andrey Konstantinovich Nartov who made a lathe with saddle. It was the great step in inventions.

Three phase induction motor – is a machine for transforming energy from alternative current for mechanical energy. Two main parts of this machine are stator and rotor. Stator is fixed detail which is cylindrical shaped, there is winding inside it. Rotor is cylindrical too but winding is on it. There are two types of induction motors: with snorted out rotors and phasic. The first are used in small and middle power, the second are for big power. In my work I research induction motors with snorted out rotors. Another name is squirrel wheel because of its similar construction. Rotors of such kind of machines consist of rods, core and rings for limit. Why do people use it? It's easy to make, cheap, reliable, gives an opportunity to be plugged in without any transmissions. Shortages are small start moment and big start current, low power coefficient.

Taking everything into account, the future is based on using electricity. People will continue trying to make their lives easier, by means of creating robots to live with. Of course it will not be possible without such thing named electric drive.

## **LATEST INVENTION TO PROTECT OUR ENVIRONMENT**

Б.С. Дубиковская  
Томский политехнический университет  
ЭНИН, АТЭС, группа 5041

Nowadays technologies are developing, everyday we can see something new and there are some developments that even could help to protect our environment. The main object of this paper is to investigate and find out the possibilities of particular findings in the area of modern engineering. It's out of the question that up-to-date life is full of technologies and smart things making our life easier and more comfortable. In this work we made an attempt to present some current ideas which help to protect our environment from human damage. First of all, we distinguish the following inventions that are worth researching from our point of view:

- The safety truck;

- The vacuum cleaner for oceans;
- Desktop DNA Laboratory;
- Solar laptop.

Further, it is necessary to expand the application of every item.

### **Safety truck**

It was suggested by Samsung company. The main purpose of it is to help avoid accidents by broadcasting view of the road on the truck`s back. It's equipped with a camera up front, which sends a live feed to four weatherproof video monitors on the back. That lets you see what's ahead of the truck so you can plan when to safely pass it. It'll also give you a heads up on potential obstacles that could make a truck brake suddenly. While the current test is only a pilot program, Samsung says it's working on expanding throughout the rest of the world.

### **Vacuum cleaner for ocean**

It is aimed to collect the trash on the surface of the seas. By the way, it will not disturb the sea inhabitants. The whole installation will start in 3 years from now. Ocean pollution has been a topic of increasing concern lately. To raise awareness about the issue, Electrolux has introduced Vac from the Sea -- a series of six limited-edition of energy-efficient vacuum cleaners made with plastic salvaged from vulnerable marine habitats. The device consists of a large bucket connected to a water pump. The water pumps sucks water into the bucket, along with plastic and other pollution. As the water makes its way down the bucket, solid objects in the water are trapped in the net that lines the bucket. The water is sucked into the water pump, in which any oil is separated. The clean, unpolluted water is then released back to the sea through another tube.

According to the designers, fish are not harmed by this invention as only objects on the surface are sucked in. An ongoing study will determine whether the buckets have any negative impacts on microscopic sealife.

### **Desktop DNA Laboratory**

Analyze DNA for 3 hours simplifies the search of donors. Moreover, it could save thousands of lives. It can also be used to quickly identify victims of disasters. THE FIELD OF production genomics has led to some remarkable findings through a genomic testing technique in which lab technicians isolate and study samples of DNA that results doctors' quick reaction to data than ever.

### **And the finally Solar laptop**

It Works from sunlight after spending 2 hours in the sun. It could work for 10 hours, thus, save your money spent on electricity bills. As a matter of fact, it could be pretty useful for electricity-starved countries.

## **REFERENCES:**

1. Colyvas, J., Crow, M., Gelijns, A., Mazzoleni, R., Nelson, R. R., Rosenberg, N., & Sampat, B. N. (2002). How do university inventions get into practice? *Management Science*, 48(1), 61-72.

2. Rimer, M. (2008). Intellectual Property and Biotechnology: Biological Inventions. Edward Elgar, Cheltenham, UK, and Northampton, MA, USA.
3. Abdullah, M. F. L., Abdullah, J., Yonis, A. Z., & Ghanim, M. F. (2011). Comparison study on 3.9 G and 4G evolution. Proceedings of the 2011 International Conference on Information Communication and Management (pp. 181-186). Singapore.
4. Alexa Internet Inc. (2012). The top 500 sites on the web. Retrieved from <http://www.alexa.com/topsites>.

Supervisor: L.A. Sobinova, PhD, Art. Lecturer, Department of Foreign Languages Institute for Energy TPU.

## **COMMUTATORLESS MOTORS AS A SOURCE OF ENERGY FOR DRONES**

K.O. Teuschakov, G.A. Nizkodubov  
Tomsk Polytechnic University

The institute of Power Engineering, group №5G53

The drone is a flying device that moves by controlling the rotation speed of engines with propellers. The principle of work of the drone is based on rotation of propellers to the opposite sides. Because of the simplicity of the design drones are often used in amateur modeling, they are convenient for taking photos and shooting videos.

### **History**

One of the first drone that was able to stay in the air was created by George de Bothezat and was tested in 1922.

### **Basic parts of a drone**

- Framework – the basis of the whole structure, which connects all the other parts. Should be strong and at the same time light.
- Engines, which provide the required thrust to lift the quadcopter in the air.
- Propellers
- Power supplies
- Sensors of acceleration / angle of cant
- Microcontroller – the brain of the device
- Remote control for the device
- Extra equipment

The frame is designed to connect all the components of the structure in the single whole. It must be pretty strong and at the same time have the ability to extinguish the vibration of the rotors.

When choosing an engine, you first need to define the flight weight for your drone so that the thrust will be able to get the drone off the ground.

The main condition is that the thrust should be twice stronger than the maximum flying weight of the structure.

Insufficient engine thrust will lead to poor handling or the inability of the machine to take off.