

additional devices to intensify the movement of the working medium. By solving a series of coupled problems of heat and mass exchange, the temperature, pressure, and velocity fields of the working medium in the manifold are determined. Based on a comparison of the results, the optimal angle of inclination of the spherical collector for the region of Kharkiv region was determined.

The results of the work are promising for use in small-scale energy or housing and communal sectors.

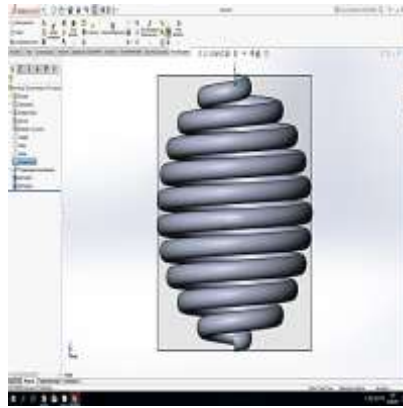


Fig. 2 Spherical solar collector simulated through the program

References:

1. Matsevitiy Y. To the construction of a spherical solar collector / Y. Matsevitiy, A. Tsentsiper, N. Safonov, S. Lushpenko. // Problems of Mechanical Engineering. - 2011. - 14, № 2. - C. 46 - 51.

2. Matsevitiy Y. Toward a spiral screw tube solar collector / Y. Matsevitiy, A. Tsentsiper, N. Safonov, S. Lushpenko. // Problems of Mechanical Engineering. – 2011. – 14, № 5. – C. 31 – 37.

MODERN ENGINEERING DEVELOPMENTS AND THEIR BENEFITS

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Modern technology is constantly evolving, so it is very diverse and broad in its application. Here are some of the latest developments in technology:

- *Robotics:* Robotics is becoming more and more common in various industries. It is used to automate production, medicine, and other industries. Robots can be used both to perform monotonous work and to perform complex tasks requiring high precision.

- *Drones*: Drones have become very popular in recent years. They are used to capture video and photos from the air, deliver goods, and even perform search and rescue operations.
- *Nanotechnology*: Nanotechnology allows the creation of materials and devices at the level of atoms and molecules. They can be used to create new materials, sensors, storage devices, and many other applications.
- *Electric car*: The growth in the number of cars in circulation and environmental pollution has led to the development of electric car. They run on electricity and do not emit harmful carbon, which helps to reduce the negative impact of motor vehicles on the environment. In addition, electric car have low noise and emissions, making them more environmentally friendly.
- *Unmanned vehicles*: Unmanned vehicles are used in a variety of industries, including aviation, shipping, and road transport. They can be used for the delivery of goods and people, military operations, exploration of distant areas, and many other purposes.
- *Virtual Reality*: Virtual reality allows people to immerse themselves in and interact with other worlds. It is used in the gaming industry, medicine, education, and other fields.
- *Genetic engineering*: Genetic engineering allows the genetic code of organisms to be altered, which can lead to improved crop productivity, treatment of genetic diseases, and many other applications.

These are just a few examples of the many modern technological developments that are currently underway. Technology development is a continuous process, and it continues to change our lives and help us solve complex problems.

New technological developments help to ensure the development of the economy and scientific research, as well as provide more comfortable and safe living conditions for people. However, it is important to remember that the use of new technologies can also have negative consequences, so we need to carefully analyze their impact on people and the environment.

Among the listed modern technologies, we can single out the most common and interesting vehicle, the electric car, which I propose to familiarize you with:

An electric car operates on the basis of electrical energy stored in lithium-ion batteries. The principle of operation of an electric car is that the electrical energy from the batteries is transferred to an electric motor, which converts it into mechanical energy necessary for the car to move. Electricity comes from the battery, which is usually located at the bottom of the car.

To control the speed and direction of an electric car, an electronic control system is used to regulate the power of the electric motor. An electric car also usually has different driving modes that allow you to save energy and increase the driving range on a single battery charge.

When driving an electric car, the battery is charged by regenerative braking, when the kinetic energy generated during braking is converted into electrical energy and stored in the batteries.

In general, the principle of operation of an electric car is very similar to that of a traditional car with an internal combustion engine, except that instead of an internal combustion engine, an electric motor is used in an electric car, and instead of gasoline or diesel fuel, electric energy from batteries is used.

The benefit of using electric cars is their more environmentally friendly nature. They do not emit exhaust gases into the atmosphere, which are the main cause of air pollution in cities. In addition, the use of electric cars can reduce fuel costs, as electricity is cheaper than gasoline or diesel fuel.

Electric cars are now used for both private and commercial transportation. They are also used in racing and other sporting events that involve automotive technology. However, electric cars have certain limitations compared to cars with an internal combustion engine (ICE). For example, they may have a shorter range and longer charging times, which makes them less convenient for long trips. Also, the batteries of electric cars have a limited lifespan, after which they need to be replaced, which can be costly.

So, while electric cars are a potentially useful technology for protecting the environment and saving resources, they still have their limitations and challenges that require further development and improvement.

References:

1. <https://corelamps.com/dzherela-zhyvlennia/litiievi-akumuliatory/>
2. <https://x-engineer.org/hybrid-electric-vehicle-hev/>
3. <https://www.engineeringchoice.com/internal-combustion-engine/>
4. <https://www.myev.com/research/ev-101/how-long-should-an-electric-cars-battery-last>

OVERVIEW OF THE GENERAL APPROACH TO THE CONCEPT OF SUSTAINABLE URBAN MOBILITY

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Sustainable urbanization is widely recognized as a key global challenge of the 21st century. Traffic congestion, air pollution, safety and noise pollution are examples of common problems in European cities. Apart from the direct impact on the environment, urban transport also affects social development, social exclusion and accessibility for people with reduced mobility.

To address these challenges in Europe and ensure competitive and resource-efficient urban mobility, the European Commission published the Urban Mobility Package in 2013. Within this package, Sustainable Urban Mobility Plans (SUMPs) are central to addressing the challenges facing urban areas.

The definition of sustainability of mobility as such can be derived from the definition of sustainable development formulated by the UN Brundtland