

AUTONOMOUS HUMAN PROMOTION WITH SOLAR BATTERIES

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ABSTRACT

This article presents the possibilities of an autonomous electric device for human mobility using solar batteries. The possibilities of creating an electric device powered by a solar battery were analyzed using a statistical method.

Electric rollers are suitable for driving on smooth city roads. Their compact size and light weight allow you to take them with you for a walk, putting them in a bag or backpack.

It was found that the device to be created has the following advantages:

- *movement without the cost of human energy;*
- *environmental friendliness;*
- *Ease of controls;*

does not require a lot of storage space

Keywords: *Electric skates, electric rollers, battery, electric drive, solar battery, control panel.*

АННОТАЦИЯ

В данной статье представлены возможности автономного электрического устройства для передвижения человека с использованием солнечных батарей. С помощью статистического метода проанализированы возможности создания электрического устройства с питанием от солнечной батареи.

Электрические катки подходят для езды по ровным городским дорогам. Их компактные размеры и небольшой вес позволяют брать их с собой на прогулку, положив в сумку или рюкзак.

Было установлено, что создаваемое устройство имеет следующие преимущества:

- *движение без затрат человеческой энергии;*

- *экологичность;*
- *Простота управления;*

не требует много места для хранения

Ключевые слова: *электрические коньки, электрические ролики, аккумулятор, электропривод, солнечная батарея, пульт управления.*

INTRODUCTION

For the development of an athlete, a child and a disabled person, it is necessary to develop motor abilities. Electric skates develop motor skills: mobility, coordination and speed. Electric skates or electric rollers consist of: roller skates, an electric motor drive (motor unit), a battery and a smooth motor drive button. The speed of the electric skates can be changed depending on the motor unit from 0 to the required one. On the basis of roller skates with electric drive, you can design a stroller. To do this, two pairs of roller skates must be installed on the stroller instead of wheels. The batteries of the front and rear wheels are first charged from the 220 V mains. In the direction of travel in sunny weather, they are recharged using solar panels.

MATERIALS AND METHODS

For the development of an athlete, a child and a disabled person, it is necessary to develop motor abilities. Electric skates develop motor skills: mobility, coordination and speed. Together we realize the importance of new technology to people:

- A disabled person needs an electric, inconspicuous and high-speed means of moving around the world and in a walker.
- The child needs electric toys - such a time.
- An athlete needs a high-speed projectile for variety in training.
- And everyone needs alternative and light transport for the summer.

The story is this: electric and hybrid scooters and bicycles were first created. Then they made electric rollers. And they realized that such an invention has no analogues abroad. And the thing is interesting and it has a great future.

The essence of the project: to give people a new transport.

RESULTS AND DISCUSSION

Electric skates or electric rollers consist of: roller skates, an electric motor drive (motor unit), a battery and a smooth motor drive button.

The speed of the electric skates can be changed depending on the motor unit from 0 to the required one.

For athletes, speeds up to 50 km / h or more can be provided. For children's models of electric skates, you can choose the optimal speed from 3 to 20 km / h.

For the disabled, the speed can be provided from 0.1 km / h to 5-10 km / h.

The smooth motor drive button is located in the hand of the electric scooter. Moreover, the button can be both on the wire and remote.

Everyone can choose for himself how he will ride: he will lazily ride in electric skates around the city or drive, or play sports, or develop his mobility, coordination and speed. Or it will just drive around the apartment, resort, museum or shopping center [1-3].



Fig.1. Electric Roller Skates

Unlike existing samples, roller skates are equipped with an additional electric drive for one of the rollers. It is possible to ride both with the use of electromotive force and without it.

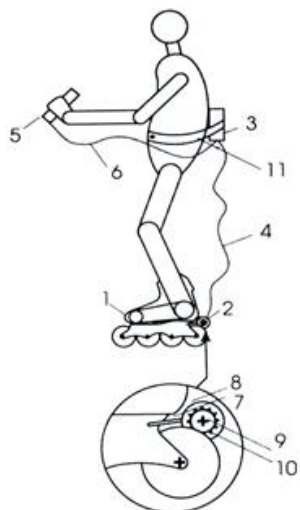
Advantages:

- movement without the cost of human energy;
- environmental friendliness;
- ease of controls;
- does not require a lot of storage space.

Design description:

In direct engagement with one of the roller skate wheels is a gear wheel driven by an electric motor. The electric motor receives power from a small battery that can be placed in a waist bag or backpack. The control is carried out from the remote control in the pilot's hand [2, 5-9].

Schematic diagram:



Positions indicate: 1-roller skates; 2-electric motor; 3-battery; 4-cable from the battery to the electric motor; 5-control panel; 6-cable from the battery to the control panel; 7-bracket of the electric motor; 8-adjusting bolt; 9-shaft of the electric motor; 10-tooth wheel; 11-belt bag

Fig.2. Schematic diagram of electric roller skates

Specifications:

Rated motor voltage, V	12
Drive mass, g	600
Maximum speed, km/h	10
Power reserve	Depends on battery capacity

Electric rollers are a novelty in the world of electric transport, which will appeal to all lovers of outdoor activities, entertainment and experiments. Younger people are enthusiastically embracing the technology, which is not unexpected given how fascinating an experience they can make of a routine walk.

Inline skates in the strictest sense are not electric skates. Unique "overlays" for shoes are placed on the heel and secured with unique straps for both children's and adult shoes. Users need to lift your toes and push off in order to begin going ahead. At the same time, the user is not even need to have skating experience to operate the motor, which switches on automatically and offers a comfortable and smooth ride. All that is required of the rider is the ability to adjust the speed of the device. And it's quite simple: to accelerate, you need to slightly raise your socks up, and to slow down, lower them. The initial speed is set by the force of the produced push at the moment of the beginning of the movement. Electric skates work synchronously, adjusting to the rider [10-12].

Features and benefits of electric rollers:

- The low power of the electric motors with which the rollers are equipped does not allow to accelerate strongly. 80-100 W (average power of models on the market) provides a maximum speed in the range of 16-20 km / h. It is safe for both children and teenagers.

- A full charge of the battery allows you to drive up to 15 km, and the charge time from the 220 V mains is 2.5-3 hours.

- Electric rollers are suitable for driving on smooth city roads. Their compact size and light weight allow you to take them with you for a walk, putting them in a bag or backpack.

- Both right-handers and left-handers can buy electric rollers.

A number of devices on the market can be controlled using a mobile application specially developed for these models, by installing it additionally on a smartphone.

The compact leg vehicle is suitable for everyday movement around the city, and as a gift to an adult or a child. In the first case, the device will reduce time and avoid traffic jams (a common occurrence in large cities), and in the second case, it will become a bright and original present. At the same time, the price of rollers with an electric motor is acceptable, since they can be safely put on a par with other types of personal electric transport designed for frequent trips [3, 14-16].

On the basis of roller skates with electric drive, you can design a stroller. To do this, instead of wheels, it is necessary to install 2 pairs of roller skates on the stroller. In Fig.3. the project of a stroller with solar panels is shown, where 1 is the upper solar panel, 2 is the side solar panel, 3 is the seats, 4 is the battery for the front wheels, 5 is the battery for the rear wheels, 6 is the front wheels (rollers), 7 is the rear wheels (rollers) [17,18].

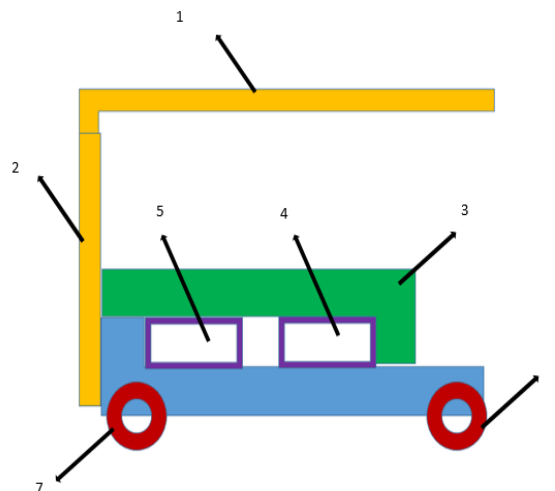


Fig.3. Stroller with solar panels

CONCLUSION

The batteries of the front and rear wheels are first charged from the 220 V mains. In the direction of travel in sunny weather, they are recharged using solar panels [19-21].

The low power of the electric motors with which the rollers are equipped does not allow to accelerate strongly. The average power of electric motors is 80-100 W, which provides an average speed within 10 km / h.

A typical solar panel produces up to 120 watts, or 0.12 kW per day. So two solar panels are enough for a stroller. One panel can measure approximately 142 by 64 centimeters.

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