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**Abstracts**

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Розглянуто нагальні проблеми економіки, інженерії, інформаційних технологій, охорони навколишнього середовища, наук про землю, гуманітарних наук.

Також приділено увагу сучасному законодавству, спрямованому на вирішення цих проблем. Матеріали згруповано у розділи, що відповідають секціям форуму і відображають сучасні тенденції та інноваційні розробки молодих учених, представників різних країн світу в різних галузях економіки.

*Відповідальність за достовірність фактів, цитат, власних імен та інших відомостей несуть автори публікацій.*

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### The device for collecting containers

In our country, the situation with garbage processing is getting worse every year. There is more and more garbage, and there is less and less space for it. Garbage not only occupies large areas, but also poisons the environment. But landfills are not the only problem. Ordinary people don't tend to recycle their garbage. Therefore, in order to solve this problem, engineers have come up with waste recycling devices. However, for recycling, it must first be sorted. But this problem is also solved by creating a device for collecting plastic containers.



Fig. 1 A device for collecting plastic containers and special image.

The device for collecting plastic containers can be the beginning of the waste processing industry in Ukraine. At the moment, Ukraine uses old technologies for elimination garbage, namely incineration. Recycling will have a positive impact on the country's environmental and economic condition. By hiding the garbage, we will not get rid of the negative impact on living beings. In addition, at the moment, recycling plants do not have enough material for processing, so they have to buy materials for processing.

A similar idea can be found in Germany (img.1). The device is designed to collect plastic bottles, and also issues checks for a certain amount of money. These devices are located in supermarkets and in order to pass the bottle you need to put it in the hole. However, not all bottles are recyclable only those that have a special image (img. 2) on them. A lot of companies are engaged in creating such machines, as Tomra (img. 3) and Sielaff.

The purposes of the project are to create a device that would be easy to use for ordinary people, as well as effectively cope with the task. The main task of the equipment is to press plastic bottles for further processing. Another goal is to create a device that is environmentally friendly and safe.

The following project has no analogue in Ukraine. The author of the article was inspired by the recycling system in Sweden where almost all garbage is recycled. Swedes carefully sort their garbage. In this way, food waste is converted into electricity, plastic is processed into new bottles, and paper into paper pulp from which new products are then produced. There is also non-recyclable garbage-it is electronics and dangerous chemicals, but for them there is also a place of delivery. However, in Sweden, garbage moves through the system of underground communications, which at the moment Ukraine can hardly afford. Another drawback is that Ukrainians are not used to sorting their garbage yet. Therefore, the machine for the collection of plastic needs to be more mobile and not so complicated. But in the process of collecting data, there was found a device similar to what the author came up with. So, the search area was switched to recycling in Germany.



Fig. 2 Recycling system by Tomra

And let us now proceed to consider how we see the tare collection machine. Conceptually, it is similar to what already exists in Germany but with a slight change in design and construction.

So, we should pay attention to the design of the machine. The case should be made of stainless steel and occupy a relatively small area. From our point of view, the machine is to be made in the style of minimalism. Due to the fact that the device presses bottles – this will help save a lot of space.

Now let's move on to the construction. The equipment has a compartment where you need to place the bottle, where it is further pressed. This device also needs a display that facilitates human interaction with the mechanism. Before placing the bottle inside, you need to scan the product code in order for the device to determine the type of bottle and its weight. After the entire operation, a check is issued for the amount of the deposited cash.

Also, the machine can be equipped with a compartment that gives out plastic mass coins with the image of the memory next to which this device is located. That is, when a plastic bottle gets into the device, it is pressed/molded into a mold, and then gets into the delivery compartment, where the user can pick it up.

In conclusion, this project is something new in our country. First of all, the container collection device should facilitate the collection and processing of plastic, as well as become a stylish addition to landscape design. This approach to the problem is a step towards civilized recycling.

**References:**

1. <https://www.dw.com/en/guide-to-separating-trash-in-germany/g-38830796>
2. <https://twitter.com/TOMRAMining>
3. <http://www.depstroj.ru/kak-sdayut-butylki-v-germanii/>
4. <https://protech.org/articles/29062019-tverdye-bytovye-i-kommunalnye-othody/>
5. <https://112.ua/statji/ekologiya-ili-ekonomika-kak-sdelat-pererabotku-musora-v-ukraine-vygodnoy-495989.html>