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TRANSPORT EQUIPMENT FOR SHMING AND DISTRIBUTION OF MSW

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Throughout the world, the problem of solid domestic waste management (SDW) is one of the priority tasks [1], and occupies the second place in the urban economy system in terms of costs and investments after the water supply and sewerage sector. For MSW (in Western countries the term "municipal" waste is usually used) include waste generated in the residential sector, in trade enterprises, administrative buildings, offices, offices, preschool and educational institutions, cultural and sports institutions, railway and bus stations, airports, river Ports. In addition, municipal waste includes large-scale waste, road and yard garbage.

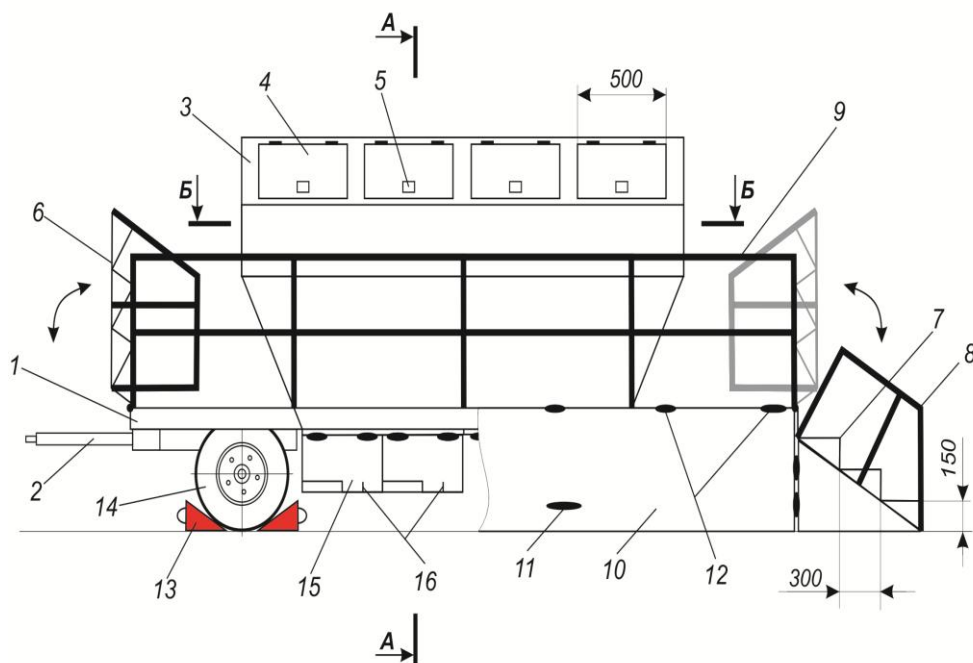
For the export of solid waste, various systems can be used, the main ones of which are direct (or one-stage) and two-stage export systems. Direct export of solid waste is currently the most common in the territory of large population centers. During such a waste disposal process, the garbage truck operates on the site in process mode according to one of the collection schemes. The duration of the technological mode depends on the density of the population on the serviced site and the placement of containers. After filling the body (replaceable containers, hopper), the garbage truck is used as a specialized truck that delivers the collected waste to the place of utilization and makes idle run to the operation site.

The average distance of removal of solid waste in Kazakhstan is 20 km, in large cities with a population of more than 300 thousand inhabitants, it increases to 45 km and more. According to the survey of the RK, about 45% of all solid wastes are transported at a distance of 10-15 km, 40% by 15-20 km, and 15% of all wastes by more than 20 km. As the statistics show, the range of export of solid domestic waste annually increases by an average of 1.5 km, and the cost of their transportation, respectively, by 15-20%.

Analysis of traditional schemes for collection and removal of garbage and a review of garbage containers shows the need to develop transport equipment for the collection and export of solid waste.

In 2015, as part of the initiative topic, the design of transport equipment for collection and export of solid waste was developed (figure). The work of transport equipment for collecting and exporting solid waste is carried out in the following way: a garbage container for the collection of solid waste is mounted on the frame of a biaxial trailer with a removable drawbar. To reduce the odor and protection from animals, the trash container is equipped with a receiving hatch with a handle.

To access the garbage container, the side boards are equipped with stairs with handrails. In order to increase security, railings are installed along the side boards on the frame. To prevent penetration under the trailer, the side boards are designed in such a way that they are lowered by means of loops to the ground and closed under a stairwell. The end and side boards are lowered into the working position by the driver manually by the handles of the sides, the sides are fixed to the frame by means of loops. When installing transport equipment for collecting and exporting solid waste to the garbage dump, the driver of the tractor first installs the brake shoes under the chassis of the trailer. After the installation of the brake shoes, it detaches the removable drawbar from the trailer and brings to the working position the end and side boards. Transport equipment for collecting and exporting solid waste is located on the garbage disposal site until the moment of filling the garbage container of solid waste. When cleaning vehicles for collection and removal of solid waste, the driver, after making sure that the garbage container is full of solid waste, firstly engages a removable drawbar with a trailer and a towing vehicle, and then removes the brake shoes and fastens them to the frame. Also, the driver lifts and fixes the end and side boards. When delivered to a landfill, the transport equipment for collecting and exporting solid waste is sent to the unloading trestle (not shown in the figure), where MSW is discharged from the unloading hatches at the base of the garbage container. Opening of unloading hatches is carried out by the driver of the tractor by pulling the bolt from the ears mounted on the hatch.



Drawing - Transport equipment for collection and export of solid waste:
 A) general view of transport equipment for collection and export of solid waste;
 B) vertical section; C) horizontal section

As a result of improving transport equipment for collection and export of solid waste, a patent for a utility model of the Republic of Kazakhstan was obtained [2]. The technical result of the proposed invention is to increase mobility and operational capabilities of transport equipment for collection and export of solid waste. This technical result is achieved by the following changes in the transport equipment for collecting and exporting solid domestic waste: a garbage container with receiving and unloading hatches is mounted on the frame of a biaxial trailer, and along the side boards there are railings; To the frame are fixed end boards equipped with stairs with handrails and side boards covering under the stairwell, preventing penetration under it.

Thus, the present invention makes it possible to increase the mobility and operational capabilities of transport equipment for the collection and export of solid waste.

References

1. Balabaev OT, Suleimenov TB, Sarzhanov DK, Zhakupov TM, Zhangeldi Ə., Kopylov VV, Sursenalieva AE, Madreimova M.M. Transport equipment for collection and export of solid waste. Patent for utility model number 1486. Registered in the State Register of Inventions of the Republic of Kazakhstan on May 19, 2016.

2. Municipal Solid Waste (MSW) to Liquid Fuels Synthesis, Volume 1: Availability of Feedstock and Technology (Prepared for the U.S. Department of Energy under Contract DE-AC05-76RL01830) PNNL-18144 December 2008.