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DEVICE FOR ADAPTING PEOPLE WITH DISTURBANCES OF HEARING AND VISION IN AREA

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The article discusses the main devices used to create a barrier-free environment in both public and residential buildings. The advantages are highlighted and directions for the use of each device are noted.

Every day, a person with a disability is faced with difficulties associated with the lack of a barrier-free environment in buildings and in the territories adjacent to them. The absence or disturbance of the sensory organs, allowing orientation in area, play an important role in interaction with the environment. Often they have to intuitively adapt to the environment in which they are located.

At the moment, modern technology allows us to adapt the environment for visually impaired or blind people, as well as for people with hearing impairment. For them, the main reference point in area are sensory (tactile) and sound devices.

Equipment and materials designed to ensure accessibility for blind and hard of hearing people can be divided into the following categories:

1. Tactile pointers. These are elements in a barrier-free environment that allow a blind person to determine their location using tactile sensations. On such devices, the basic information is duplicated in Braille.
2. Tactile-sound devices. Such tactile devices transmit information with sound. The information on this index can be used by people who do not know the technique of reading in Braille.
3. Visual and sound devices. These are emergency warning systems that provide information to all visitors to a public building.
4. Tactile-visual marking. It acts as a designation of a bladed-less direction of movement for blind and visually impaired people in area.

Complete navigation in area for blind and visually impaired people can be done using tactile tablets and mnemonic diagrams, which relate to tactile pointers.

Tactile tablets can be located both inside and outside the building, approximately near the doorway on the handle side. Information on pointers is applied using flat-convex fonts, and can also be supplemented with Braille (Fig. 1, a). This is a point-to-point tactile font designed for writing and reading by blind and poorly seeing people. Designed in 1824 by the Frenchman Louis Braille. For the image of letters in Braille, six points are used, which are located in two columns [1].

The tactile tablets indicate the names of educational, medical and other public institutions, as well as the numbers and names of rooms and rooms. To inform a completely blind person, the indicators are placed at a height of 1100 mm, for the visually impaired - at a height of 1400 to 1600 mm. To ensure high performance, tactile products should be made on the basis of PVC plastic with a thickness of at least 3 mm. To ensure a contrasting effect, as well as to ensure optimal conditions for color perception by a visually impaired person, the tactile plate should have a yellow body color (RAL 2021) [2,3].

Unlike tactile tablets, tactile mnemonic diagrams, with the help of their relief, convey the entire floor plan, the main landmarks of movement in area, designed specifically for blind or visually impaired people (Fig. 1, b). Information is presented in a tactile way using the Braille system. On the mnemonic diagrams, a plan of the room, an evacuation plan, a plan of bathrooms, etc. are applied. Tactile mimics are mainly located in the lobby of the building, not far from the entrance at an altitude of 1100 mm from the floor. Due to the fact that tactile pointers made in a layer-by-polymer manner are the most easily perceived by blind people, a tactile surface is a relief consisting of a set of polymer layers, where each subsequent layer is polymerized on the surface of the previous one using UV radiation. The number of polymerized layers determines the height of the tactile image of at least 0.8 mm [4].

For the manufacture of each of the listed pointers, qualified specialists are required for the correct compilation of information, as well as time for the production of the device. For quick adaptation of objects and premises, tactile stickers are used (Fig. 1, c). They can be applied to the buttons of intercoms and elevators, on keyboards, handrails, household appliances, vehicles, etc.

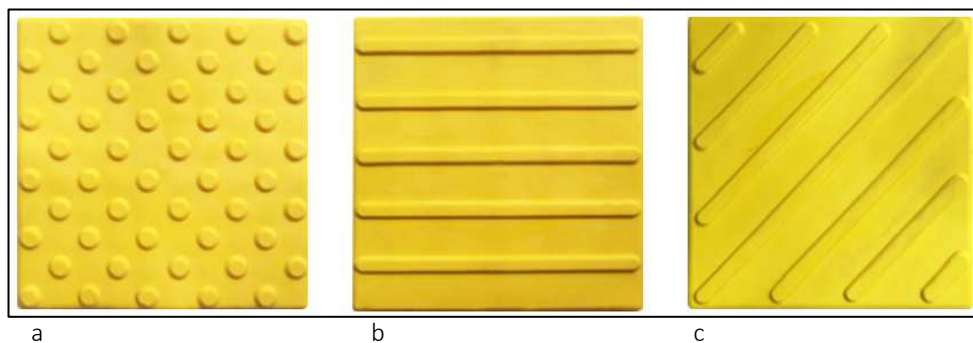


a - tactile braille label; b - tactile mnemonic diagram; c - tactile sticker on the handrail

Figure 1. – Tactile pointers

Tactile-sound devices include tactile tablets and tactile mnemonic circuits equipped with special sound panels. Such elements transmit tactile information with sound. These stands are widespread at socially significant objects: museums, exhibition halls, libraries, park areas, metro, city center. Each device is equipped with a clear-relief image, basic information duplicated using the Braille system, as well as sound buttons with professional voice acting [5].

Visual-audible warning systems, sound beacons are the most common devices for voice informing visually impaired and blind people. They are located in the lobby of the building with pre-recorded sound tracks, to ensure comfortable movement of people with limited mobility in area. Also, these systems additionally alert people with general information about this institution.



a - warning (conical); b - guide (longitudinal); c - rotary (diagonal)

Figure 2. – Tactile tiles

You can also coordinate movements using tactile-visual markings. Contrast marking, tactile indicators, tactile tape, etc. belong to it. Nowadays, the most important and widespread device for navigating people with visual impairment is tactile tile (Fig. 2). It allows you to navigate in area and follow the correct and safe direction

of movement [6]. The most common are three types: conical, longitudinal and diagonal. The cone tile serves to inform the obstacles to the movement of people with disabilities. To direct the path of movement and to inform about the turn, longitudinal and diagonal tactile tiles are used respectively.

Tactile PVC and TPU eco-tile Designed for laying both outdoors and indoors. It is made using raw materials after recycling. To ensure long-term performance, the tile must be made of high-quality thermoplastic elastomer with a hardness on the Shore scale of not more than 85 units on the scale A. To ensure high performance on abrasion, the product must be painted in the total weight of the material. Product color RAL 2021 [7].

In public areas with low maneuverability, a self-adhesive tactile tile and tactile tape are used for navigation. Also, carpet and rubber coverings, as well as materials contrasting in color and texture with the main coating, can be used as tactile guides.

The proper use of devices for the adaptation of people with visual and hearing impairments in area will help to properly coordinate the movement of the mobility impaired population. Creating a barrier-free environment allows people with disabilities to fully function in area and society.

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