

СПЕЦІАЛЬНІ РОЗРОБКИ

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MODERN EQUIPMENT FOR SPECIAL MILITIA UNITS: SCALING LADDER

Features of the construction and technical features of the domestic standard of a scaling ladder are considered. Advantages of the created standard are stated. The references of the special units of law enforcement bodies got as a result of the educational trainings with use of pre-production models of a scaling ladder are analyzed. The next steps, related to the creation of new modifications of a scaling ladder with the purpose of providing the special units of militia with the newest models of the technical tools for the further use in official activities are considered.

Keywords: *scaling ladder, overcoming of vertical obstacles, recent developments, special units of militia, OIA.*

During carrying out the official tasks the special units of the law-enforcement bodies have to solve the tasks of varying complexity that requires the use of various tools, special tools and weapons.

In particular, to overcome vertical obstacles with the height of about 5 m or climbing these obstacles (buildings, transport etc.) the employees of special units in many countries use scaling ladders which according to their structure, technical characteristics and purpose differ from industrial and domestic ladders or special ladders, created for other units, for example fire departments.

Nowadays not so many world enterprises product scaling ladders.

They tend to specialize in manufacturing of a variety of technical means and special equipment for military and special forces.

The most famous among them are: Portal Ladder (USA), which manufactures: the products by the trademark Quickstep Ladder TM, Camlock Tactical Systems, CLOW Group (Great Britain).

On the territory of the CIS such production is manufactured by Russian enterprises NOU "Training Centre "Vityaz" and "Centre of Superhard Materials "Armirovanniye Kompozity" [1].

The construction of scaling ladders for the special units of law enforcement bodies of different countries is different.

In the first place to take into account are the problems set directly before this or that special unit as well as other factors: quantitative composition and tactics of unit, the level of training of its employees etc.

At this time most of special units MIA of Ukraine are not provided with scaling ladders but use domestic ladder, fire, homemade etc. that reduces the effectiveness of special operations and increases the risk of injury to employees while performing official tasks.

The problem of providing the special units MIA of Ukraine with scaling ladders can be solved by purchasing of foreign samples.

However, this version of the support has a number of disadvantages, including: the high cost of foreign products, which includes not only the cost of the products, but also the cost of delivery, customs fee etc.

complex procedure of purchase abroad of such products and the absence of enterprises, selling such products in Ukraine;

complex process of the cooperation of units, the Service of Provision MIA of Ukraine with foreign enterprises, that makes it impossible to order scaling ladders, which construction would meet the requirements of the special units MIA of Ukraine;

the manufacturing of several constructive elements of the products according to the requirements of unit or separate group units, changes of the design of the products according to the results of the operation;

an absence in Ukraine of foreign manufacturers of such production, which complicates the process of after-sales service.

Considering the above mentioned and in order to solve the problem of providing the special units of law-enforcement bodies of Ukraine with the scaling ladders in 2013 the experts of the State Research Institute MIA of Ukraine on the order of dealing with organized crime and the Department of Public Security MIA of Ukraine along with Ltd. KB "Pozhspetsmash" (Priluki) carried out the research "The Development and Manufacturing of the Prototypes of the Scaling Ladders for Special Militia Units, cipher "Drabyna".

As a result of this experimental design work it has been developed a set of working design documents on the "Drabyna" for special militia units of Ukraine, three experimental samples of a product have been manufactured and their testing has been carried out.

The substantial help in the developing of the scaling ladders became a long-term experience of Ltd. KB "Pozhspetsmash". At the design stage were analyzed the samples of fire ladders, identified typical profiles that are used for their manufacture and that can be applied for the production of scaling ladders.

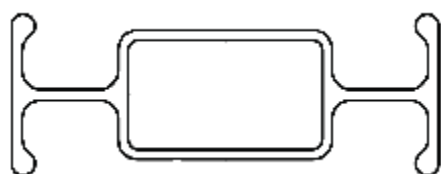


Fig. 1

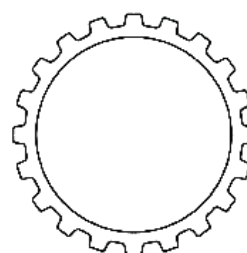


Fig. 2

When designing the construction of the scaling ladder the representatives of special units have set up a series of claims for future products that would allow them to increase the efficiency of performing special tasks. In particular the product had to provide: the rise of forces at the level of the 2nd floor of common buildings (height of about 5 m); simultaneous staying on the ladder of 4 employees (their total weight is not more than 600 kg); simultaneous lifting and staying on one knee of a ladder of 2 employees (their total weight is not more than 300 kg).

Fixing the ladder at intermediate attitudes with 350 mm;

The presence of structural elements for easy carrying and fixing of scaling ladders in operation position

The presence of structural elements for easy moving of scaling ladders on the supporting surface (rollers, wheels);

The presence of structural elements for the reliable installation of a ladder on the supporting surface.

Noise reducing during the moving of ladders (applying of fluoroplastic label);

The possibility of transporting of the scaling ladders by the cars of special units;

According to the requirements were produced three samples of the product “Scaling Ladder” and their previous and acceptance trials were held.

The Commission comprised the representatives of the organized crime and public security departments MIA of Ukraine, the developer – the State Research Institute MIA of Ukraine, a potential consumer – the Internal Troops MIA of Ukraine, manufacturer – Ltd. KB “Pozhspetsmash”.

In order to check the compliance of manufactured prototypes of the scaling ladders with the requirements of the specification of the research during the trials the inspection was carried out:

verification of the completeness of products;

checking the appearance and general construction products;

checking of the linear parameters of products;

checking of the weight of products;

tensile testing of the products and their rungs;

testing of products on bending deflection;

checking of moving and reliability of the fixation of the bends of products;

checking of the fastening of products rungs;

checking of products marking;

checking of the hardness of the metal of the strings of products.

During the trials the members of the commission have made necessary adjustments to the product construction. According to the results of tests the product “Scaling Ladder” (Fig. 3,4) has been recommended for use in practical activities of special units of the Ministry of Internal Affairs



Fig. 3 Scaling ladder in transfer position



Fig. 4 Scaling ladder in ready-to-work position

Product is intended for use by special units MIA of Ukraine to overcome or climb vertical obstacles up to 5 m (buildings, transport etc.) by the employees of units (up to 4 persons) in the performance of their official tasks. The product includes: ladder – 1, registration certificate – 1, service instruction – 1.

Table 1

The main technical characteristics of the product are shown in the table 1.

Units	Meaning
Overall dimensions:	
the length in transfer position, mm	2800 ± 30
the length in ready-to-work position, mm	4870 ± 30
width, mm	1070 ± 10
height in transfer position, mm	265 ± 10
distance among rungs, mm	350 ± 2
total weight, kg, not more	36

The structure of a scaling ladder consists of two telescopic sliding bends, made from similar profiles and parts (Fig. 5).

The principle of the sliding of rungs is manual. Sliding movement is quiet due to fluoroplastic bushes.

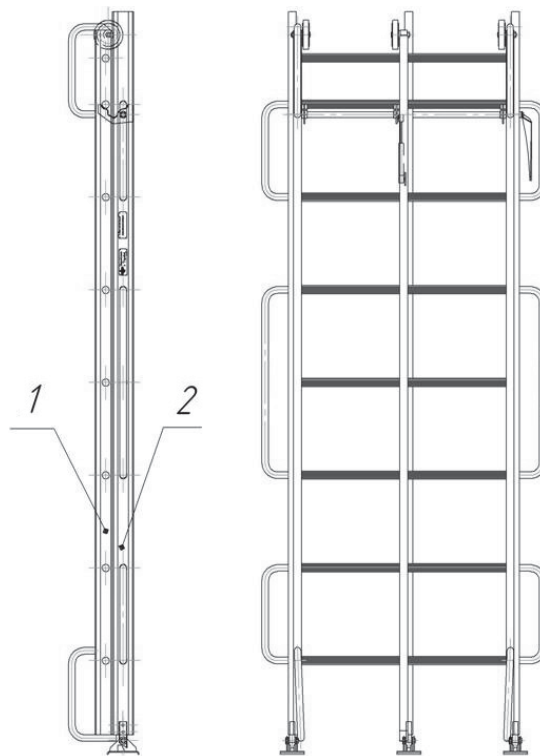


Fig. 5 General structure of a scaling ladder:
1 – top bend (first), 2 – lower bend (second)

This scaling ladder is not universal for all the works, which get the employees of special units during carrying out of special tasks, however its design meets the cases of all special units MIA of Ukraine and it will improve the effectiveness of the special operations in the majority of cases. For other office tasks (for example, in the circumstances when on a scaling ladder can move only one employee of the special unit in complex conditions (under carriage trains etc.) it is necessary to create new products and new modifications of home modern scaling ladders for special militia units.

Created by the State Research Institute MIA of Ukraine on order of the departments of organized crimes and public security product "Scaling Ladder" meets the requirements of the customers and is recommended by the members of the selection committee for an application in practical activities of the special units OIA. Its application will enhance the effectiveness of the performance of the employees of the special units of official tasks during special operations etc.

An acquisition of the analogues of such ladders is not appropriate, both in terms of saving budget funds, and from the point of view of special products with necessary technical characteristics, the possibility of amending the created products and carrying out their service.

The scaling ladder is the first product for the purposes of OIA of Ukraine. At the same time as a result of its operation by the special units the employees will easier establish the requirements for the developing of new designs of modern scaling ladders for special units of police.

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