Seminar lesson number 5
Topic of the lesson: "Classifiers used in commodity research. [1] Commodity classification of medical and pharmaceutical products. [2]
Trade information tools. [1] General requirements, characteristics. Bar coding of medical goods. [2] »

The main questions to be discussed at the seminar:

1. Trade classification of goods. Characteristic. Place of medical and pharmaceutical products in the trade classification.
2. Classification systems for medical goods. Signs by which medical and pharmaceutical products can be classified.
3. Goods coding: concept, structure, coding methods. The structure of the code, its main elements.
4. Characteristics of sequential, ordinal, serial-ordinal and parallel encoding methods (methods).
5. Anatomical-therapeutic-chemical classification. Application in the commodity analysis of medicines.
6. Bar coding of goods. Definition, advantages and disadvantages of bar coding.
7. Characteristics of bar coding systems for goods. Bar code structure in EAN, UCC systems. Devices that read bar codes.

TYPES OF CLASSIFICATION

In merchandising, the most common national, trade and educational classifications. The nationwide classification of goods is carried out in accordance with the "Regulations on the development, adoption, implementation, maintenance and application of all-Russian classifiers of technical, economic and social information in the socio-economic area", approved by Decree of the Government of the Russian Federation of November 10, 2003 No. 677 "On all-Russian classifiers technical, economic and social information in the socio-economic area", the development of all-Russian classifiers is provided by the federal executive authorities and is carried out in agreement with the Federal Agency for Technical Regulation and Metrology, the Ministry of Industry and Trade of Russia and the State Statistics Committee of Russia. In accordance with the above resolution, as well as on the basis of the "Action Plan for the formation of a methodology for systematizing and coding information, as well as the improvement and updating of all-Russian classifiers, registers and information resources", approved by the Deputy Chairman of the Government of the Russian Federation on August 10, 2013 No. 4760p-P10, the Ministry economic development of Russia, a new edition of the classifiers was developed, put into effect by order of the Federal Agency for Technical Regulation and Metrology dated January 31, 2014 No. 14-st, in accordance with which the All-Russian Classifier of Economic Activities (OKVED 2) and the All-Russian Classifier of Products by Type economic activity (OKPD 2). The same order canceled from January 1, 2015 the operation of a number of classifiers, including the All-Russian Classifier of Economic Activities, Products and Services (OKDP) OK 004-93, the All-Russian Classifier of Products by Types of Economic Activities (OKPD) OK 034-2007, the All-Russian Classifier of Services population (OKUN), All-Russian classifier of products (OKP).

Trade classification of goods. Goods as objects of commercial activity can be divided according to many characteristics, among which the main one is the purpose. So, by purpose, all goods are divided into genera:

► consumer goods are intended for individual consumers for personal use;
► industrial goods - goods intended for the production of other goods and creating its raw materials and technological support;
► office supplies (goods for the office) are designed to improve the organization of administrative and managerial activities.

Each kind of goods is subdivided into subgenuses and classes.

The genus of consumer goods is divided into three classes: food, non-food and medical goods.

A class of goods is a set of goods that satisfy generalized groups of needs. Classes of goods are divided into subgroups depending on the raw materials used, purpose and other characteristics; subclasses - into groups, subgroups, species and varieties, names. A subclass of goods is a set of goods that satisfy similar groups of needs that have certain differences.
A group of homogeneous goods is a subset of goods that satisfy specific groups of needs, which is due to the characteristics of the materials used, their finish, etc.
A subgroup of goods is a set of goods that have a common purpose with the group, but differ from the goods of other subgroups only in their inherent characteristics.
The type of goods is a set of goods that differ in their individual purpose and identification features.
A variety of goods is a set of goods of the same type that differ in a number of particular characteristics.
The name of goods is a set of goods of a certain type, which differ from goods of the same type by their own name and individual characteristics, which are due to the selection of raw materials, materials, as well as design, technology. The name of goods can be nominal and branded.
Nominal name - nominal generalized name of the goods produced by different manufacturers. For example, "Acetylsalicylic acid tab. 0.5 g, pack . contour . cell . 10", "Multivitamins in dragee", etc.
A brand name, or trade mark, is the individual name of a product produced by a particular manufacturer. Quite often, a patent is issued for this name, which provides copyright protection for the brand name, for example, " Trombo ACC♠", " Pikovit ♠".
Thus, classes, subclasses and groups constitute the general commodity classification of consumer goods.
Classification of goods used in international trade.
In the international trade system, the classification approach is becoming more widespread, the basis of which is formed by the following classes of goods:
► single product: characterizes goods for both personal demand and industrial purposes;
► product group: typical for both personal use goods and industrial goods - first-aid kits, sets of medical instruments;
commodity-object: the need to develop a systematic approach to the production and sale of products requires the concentration of huge material and labor resources under a single financial, technological and administrative control;
► product-program: predominantly an intellectual product created in the field of aerospace business, automated control systems, robotics, intellectual and bioengineering technologies.
A characteristic feature, even the law of the development of the world market, is the increase in the flow of intellectual, high-tech goods. Science-intensive goods are understood as products of intellectual labor created on the basis of the use of progressive scientific and technical ideas and technologies and having significant prospects for their application.

1.3. FEATURES OF THE CLASSIFICATION OF MEDICAL DEVICES

Considering the objects of pharmaceutical commodity science of non-drug assortment from the standpoint of world practice, it should be noted that in the main international classification systems, including Russia, the general concept for this product category is "medical device" (Medical device). The Uniform Sanitary-Epidemiological and Hygienic Requirements for Goods Subject to Sanitary-Epidemiological Surveillance (Control) provide the following basic definitions.
Medical devices - products intended for use in medical practice, including devices, dressings and sutures, products made of polymer, rubber and other materials that are used for medical purposes individually or in combination with each other and which are intended: for prevention, diagnosis , treatment of diseases, rehabilitation, medical procedures, medical research, replacement or modification of parts of tissues, organs and the human body, restoration or compensation of impaired or lost physiological functions, control over conception; impact on the human body in such a way that their functional purpose is not realized through chemical, pharmacological, immunological or metabolic interactions with the human body.
Products of medical technology - devices, devices, tools, devices, complexes, systems with program control, equipment intended for use on a person for the purpose of: research, diagnosis, observation,

treatment, prevention, alleviation of a disease, compensation for injury or disability and maintenance of physiological functions .
Medical devices - medical devices and medical equipment - any instruments, devices, devices, devices, materials or other products used individually or in combination with each other, including the software necessary for their intended use, which are intended by the manufacturer for use in to a person for the purpose of: diagnosing, preventing, monitoring, treating or alleviating a disease; diag -
nostics , observation, treatment, alleviation or compensation for an injury or disability; research, replacement or modification of anatomy or maintenance of physiological functions; conception management; provided that their principal effect is not based on the pharmacological, immunological or metabolic effect of the application, but which may contribute to the introduction into the body or delivery to the surface of the human body of agents that cause the above effects.
Existing state standards offer the following detailed definitions of a number of categories of pharmaceutical merchandising. Medical devices - products of medical equipment designed to receive, accumulate and / or analyze, as well as display measuring information about the state of the human body for diagnostic or prophylactic purposes. Medical devices - products of medical equipment intended for therapeutic or prophylactic effects on the human body or for replacing or correcting the functions of organs and systems of the body. Medical equipment - products of medical equipment designed to provide the necessary conditions for the patient and medical personnel during diagnostic, therapeutic and preventive measures, as well as when caring for the sick. Medical complexes - a set of medical equipment products, each of which performs a certain particular function in the system of a complex diagnostic, therapeutic or preventive measure
One of the main tasks of the nomenclature classification is the identification of products during information exchange for the implementation of state functions for the registration of medical devices, control of production, circulation, condition and use of medical devices on the territory of the Russian Federation, primarily for monitoring the safety of medical devices.
One of the key issues of harmonization (mutual agreement, integration into a system, unification) in the field of medicine is the creation of a unified range of medical devices. The main task of the created World Nomenclature of Medical Devices (Global Medical device Nomenclature , GMDN) is to provide all structures involved in the circulation of medical devices with a system of unambiguous definition and name of a medical device.
Currently, GMDN unites more than 20,000 positions. At the same time, all positions of the considered nomenclature are united by the concept of "medical device". However, the category of “medical products” includes products that are not medical devices in terms of domestic legislation, such as batteries or personal computers.

1.4. CODING OF GOODS: CONCEPT, STRUCTURE, CODING METHODS
Goods coding is the formation or assignment of a code to a classification group or object of classification. A code is a sign or a set of signs used to designate a classification grouping and/or an object of classification.
The purpose of coding is to systematize objects by classifying, identifying, ranking and assigning a symbol (code) by which you can find and recognize any product among many others. With the introduction of computer technology, the need and importance of coding has increased. The assignment of codes is carried out on the basis of certain rules and methods.
The encoding rules are as follows:
► the code must have a certain construction structure;
► the code must be expressed using various, predetermined characters;
► the code should contribute to the ordering of objects.
The structure of the code is a conventional designation of the composition and sequence of the arrangement of characters in it. The structure of the code consists of elements such as alphabet, base, digit, and length.

Code alphabet - a system of signs adopted to form a code. As the alphabet for codes, numbers, letters or their combinations, strokes and spaces are most often used.
Accordingly, a distinction is made between digital - the alphabet of the code, the signs of which are numbers, the alphabetic - the alphabet of the code, the signs of which are the letters of the alphabets of natural languages, the alphanumeric - the alphabet of the code, the signs of which are the letters of the alphabets and numbers, the bar code alphabet - the alphabet of the code, the signs of which are strokes and spaces, the width of which scanners read in the form of numbers. The base of a code is the total number of characters in its alphabet. The sequence of characters in the code is determined by its rank. Code digit - the position of characters in the code. Since each sign characterizes some predetermined feature of the product, the code category carries a certain semantic load. For example, according to OKDP 2, preparations of salicylic acid and its salts have the code 21.10.10.110. The digit of the code, indicated by the numbers 21 (first position), means that this is a drug belonging to the group "Medicines and materials used for medical purposes."
The dot is the separator between characters. In the above example, the dot separates: 21 - “Medicinal products and materials used for medical purposes”; 10 - "Pharmaceutical substances"; 10 - "Salicylic acid, O-acetylsalicylic acid, their salts and esters"; 110 - "Salicylic acid and its salts."
The code is also characterized by its length. Code length - the number of characters in the code without dots. For example, the above code 21.10.10.110 has a length of 9, and the base is 12. Thus, the length of the code (Dk) differs from its base (Ok) by the number of dots (Tk), or
Dk \u003d Ok - Tk .
Coding of goods and other objects is carried out in several ways, which are varieties of the coding method. These include ordinal, serial-ordinal, serial and parallel methods. The last two coding methods are closely related to the varieties of the classification method (Fig. 1.5).
The ordinal coding method is the formation and assignment of a code from the numbers of the natural series. An example of an ordinal method is the assignment of numbers (codes) when listing students in alphabetical order in the group journal, the names of drugs in the invoice, etc.
This is the simplest and most common coding method that does not require specific knowledge in this area. It allows you to encode objects classified according to one or more conditional or random features. For example, medicines on the consignment note are coded alphabetically by name; other signs (dosage form, dosage, storage conditions, etc.) are random.
Serial-ordinal coding method - the formation and assignment of a code from the numbers of the natural series, the assignment of individual series and ranges of these numbers to an object of classification with certain characteristics. An example is the coding used in the Anatomical Therapeutic Chemical Classification (ATC) (Anatomical Therapeutic Chemical - ATC). So, drugs used to treat blood diseases receive an index B, and then a certain serial number: for example, anticoagulants - B01, heparin and its derivatives - B01AB.

Sequential coding method - the formation and assignment of a code of a classification group and / or an object of classification using codes of sequentially located subordinate groups obtained using a hierarchical classification method. This method is characterized by all the advantages and disadvantages of the hierarchical classification method. Its main advantages are a high degree of ordering and the ability to identify general and particular features. A clear illustration of a sequential encoding method can be represented by
below is a fragment from OKPD 2, in which the classification of the product group "Equipment for irradiation, electrical diagnostic and therapeutic, used for medical purposes" is partially given, which is divided into subclasses (XX.X), groups (XX.XX), subgroups
(XX.XX.X), type (XX.XX.XX), category (XX.XX.XX0) and subcategory
(XX.XX.XX.XXX) according to interrelated features. Code Description
26.6 Irradiation equipment, electrical diagnostic
therapeutic and therapeutic, used for medical purposes
26.60 Irradiation equipment, electrical diagnostic

therapeutic and therapeutic, used for medical purposes
26.60.1 Equipment and apparatus for irradiation, rehabilitation,
electrical diagnostic and therapeutic, used for medical purposes
26.60.11 Apparatus based on the use of x-rays
alpha , beta or gamma radiation used for medical purposes
26.60.11.110 X-ray devices used for medical purposes, including surgery, dentistry, veterinary medicine
26.60.11.111 Computer tomographs
26.60.11.112 X-ray apparatus (fluoroscopic)
26.60.11.113 X-ray apparatus
26.60.11.114 Apparatus for use in dentistry and veterinary medicine
Parallel coding method - formation and assignment of a code of a classification group and/or an object of classification using codes of independent groupings obtained using the faceted classification method. With a sufficiently high degree of ordering, the independence of groupings does not allow us to fully reveal the commonality and differences in features. However, for this coding method , any predetermined capacity of classified objects and positions is possible. An example of a parallel coding method is ATC - a system for dividing drugs into groups depending on their effect on a specific anatomical site.
organ or system, as well as their chemical, pharmacological and therapeutic properties.
Each coding method has certain advantages and disadvantages, a comparative analysis of which is presented in Table. 1.2.
In general, the set of methods and rules for encoding classification groups and classification objects of a given set is called a coding system.

Table 1.2. Characteristics of various coding methods

Encoding method	Advantages	Flaws
Ordinal	Ease of assigning codes. Economical use of 9999 codes accepted in classifiers	Lack of additional information ab impossibility of highlighting th and difference between objects
Serial ordinal	Ordering objects by series, resulting in additional information	Additional distribution by objec certain characteristics is required
Consistent	With a small code length, a large information capacity	Rigidity of the code due to st sequentially encoded features. Th changing the code to introduce ne
Parallel	Good machinability, code flexibility makes it easy to make necessary changes to the facet	Insufficient communication betv groupings

1.5. BAR CODING
A barcode is a machine-readable code consisting of parallel lines of different thicknesses encoding a sequence of digits, which makes it possible to present information about goods in a form convenient for its (automated) collection, transmission and processing.
The need to introduce bar coding arose in connection with the development of information technology, the widespread introduction of computer technology in the production and sale of pharmaceutical products. As a result, it became possible, due to the automation of accounting for the receipt, shipment and sale of goods, to accelerate

goods movement and simplify the documenting of goods at different stages of goods movement. Manual filling of documents, searching for the right goods in the warehouse require a lot of time and labor, and errors are possible when performing these operations. There are several major bar coding systems currently in use around the world.
European EAN system (European Article Numbering). Two EAN codes are most widely used: 8-bit and 13-bit digital codes, which are a combination of strokes and spaces of different widths. The narrowest stroke is taken as one. Each digit (or digit) consists of two strokes and two spaces (Fig. 1.6, 1.7). Code

EAN-8 is for small packages where a longer code cannot be placed. EAN-8 consists of a country code, a manufacturer's code and a check number (sometimes the product registration number instead of the manufacturer's code).

Rice. 1.6. Appearance of the 8-bit EAN code

Rice. 1.7. Appearance of the 13-bit EAN code

The 13-bit code consists of the country code, the code of the enterprise (firm) - the manufacturer, the code of the product itself and the control number (see Fig. 1.7).

The EAN Association has developed the country codes and centrally licenses the use of the codes. In table. 1.3 shows examples of codes for a number of countries.

For example, France received a range of 30-37 to designate their country, Italy - 80-83. For some countries, three-digit codes: Greece - 520, Brazil - 789, Russia - 460, Hungary - 599. The manufacturer's code is compiled in each country by the appropriate national authority. It consists of five digits following country code. In Russia, bar coding is handled by the Foreign Economic Association for Automatic Identification Problems (UNISCAN/GS1 RUS), whose task is to introduce global standards and solutions aimed at improving the efficiency and transparency of supply chains in all economic sectors of the country.

The product code is compiled directly by the manufacturer (five digits). The decoding of the code is not standard, it may reflect certain characteristics (features) of the product itself or it represents the registration number of the product, known only to this enterprise. The check digit is designed to establish the correctness of the code reading by the scanner according to the EAN algorithm.

Both a proportional increase in the EAN-13 symbol up to 200% of the nominal dimensions, and a decrease up to 80% are allowed. Height truncation of the barcode is not allowed. Height reduction
symbol while maintaining its horizontal dimensions (truncation) prevents the normal operation of multi-beam scanners, which are widely used in pharmaceutical organizations.

American UPC system (Universal product code). It was developed in North America in 1973 for the retail needs of the United States and Canada, where it is still used today. The code length is represented by 12 digits, since the country prefix in this system always consists of two digits (Fig. 1.8). Each code position is formed by two dark and two light strokes. The UPC code symbol consists of two parts - left and right. Each part is in the shape of a rectangle. The elements on the left side are a mirror image of the right side. The light bar means zero, the dark bar means one.

Rice. 1.8. Appearance of the UPC code

There are three types of UPC code:

► UPC-A - contains 11 information and 1 control character; designed for coding food and non-food products sold through supermarkets;

► UPC-D - designed for coding non-food products;

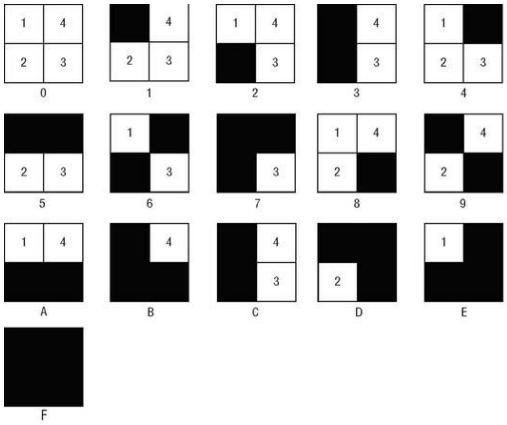
► UPC-E - has 6 characters and is a truncated version of UPC. Any information is encoded.

West German BAN system (Bundes Ainheitliche Artikelnummer).

In Germany, the BAN code system, introduced in 1968, still quite firmly retains its place. The code symbol consists of 8 digits: the first and second digits contain information about the type of goods; the third - the number of the product group; the fourth - the number of the assortment group; fifth, sixth and seventh - the serial number of the goods; the eighth is the sample number. BAN applies only to the designation of consumer goods.

Japanese CALRA-CODE system. Introduced in Japan in 1987, it is a graphic coding system. It consists of 10 large squares, each of which is divided into smaller squares of the same size. Specific numbers are assigned to them: 1, 2, 4, 8. Hatching options for a small square in relation to the main one allow coding the corresponding goods (Fig. 1.9). Accordingly, each square is assigned a certain, invariably one and the same figure. Hatching corresponding fields

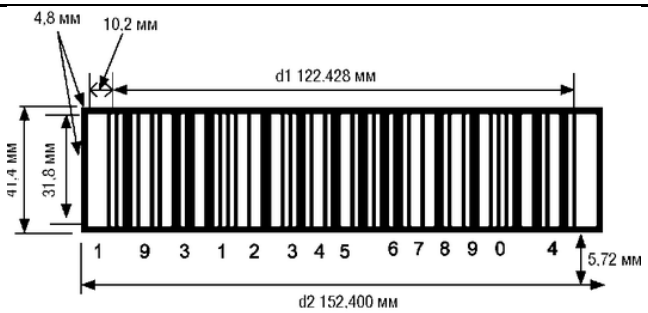
creates the possibility of obtaining a large number of combinations on 10 large squares and allows you to encode a billion alphanumeric combinations.



Rice. 1.9. Alphanumeric coding options in the CALRA-CODE system

Comparing the CALRA-CODE system and the EAN system, it should be noted that the former is easier to use, contains more information, and the device for reading and decoding it is cheaper and much more efficient even if the print is not clear. Reading the code is possible even if the square is distorted up to 1 mm. Despite its advantages, the CALRA-CODE system is now used only in Japan and has not been adopted in other countries.

Special mention should be made of the system of bar coding of transport packaging. A 14-digit EAN/UCC-14 number is applied to the shipping packaging as a barcode. This uses the graphic symbolism "2 of 5 interleaved" (Interleaved Two of Five - ITF), therefore the barcode is also abbreviated as ITF-14 (Fig. 1.10).



Rice. 1.10. Appearance and dimensions of the ITF-14 barcode

Compared to EAN codes, the ITF symbology is characterized by significantly larger barcode image sizes (width - 152.4 mm, height - 41.4 mm) and less stringent surface specifications. Thus, the ITF-14 bar code can be printed not only on labels, but also directly on the walls of cardboard boxes. Even in this case, it will be successfully read by scanners. The code includes 12 EAN/UCC-13 information bits (except for the control one), which determine the main characteristics of the packaged products. The information content of the ITF-14 barcode is presented in Table. 1.4.

Table 1.4. Information content of the ITF-14 barcode

Barcode structure 1407009520084 (example)				
one	460	700952	008	fou
	EAN/UCC-13 without check digit			
Logistic variant - different shipping packages with the same contents (EAN/UCC-13) differ in the rank of the logistic variant. Valid numbering - from 1 to 8	National organization prefix - UNISCAN/GS1 Russia	Company registration number - generated when registering a company with UNISCAN/GS1 Russia	Products - each individual type of product (single package) corresponds to a separate serial number. Products packed in group packaging are also assigned a number	Co cat cal the pre

The authenticity of the goods can be determined after calculating the check digit of the bar code. Assume that there is an ITF-14 barcode - 7290000494616. The calculation is made as follows:

1. Add the numbers of the bar code in even places: 2 + 0 + 0 + 4 + 4 + 1 = 11.
2. Multiply the resulting amount by 3: 11 × 3 = 33.
3. Add the numbers in odd places without a control digits: 7 + 9 + 0 + 0 + 9 + 6 = 31.
4. Add the numbers calculated in paragraphs 2 and 3: 33 + 31 = 64.
5. Discard tens from the amount received: it turns out 4.
6. From 10 subtract the figure obtained in paragraph 5: 10 - 4 = 6.

If the figure obtained as a result of the calculation (see point 6) does not match the check digit in the barcode , this means that the product was produced illegally and its quality is not guaranteed. Since January 1993, the bar code must be applied to all goods entering Europe. The price of a product released to the market without a bar code is reduced by 3-15% of its value.

1.6. INTERNAL BARCODING IN A PHARMACY

It is known that, as a rule, goods are delivered to pharmacies already with the manufacturer's barcode applied . But there are situations when it is necessary to perform internal barcoding. This is necessary in the following cases:

1) when there is no barcode at all;

2) when a product of the same type has a barcode , but at the same time the product has different characteristics that are important for accounting, for example , packing size, dosage, etc.;
3) when it is convenient to take into account the goods not in basic units, but in packages for the receipt of goods or inventory;
4) when the product has a unique subordinate code - serial number, series, inventory number, etc.
barcode printers are used to create internal barcodes . Barcode printers are designed for labeling goods with barcodes with minimal labor costs for pharmaceutical personnel. They provide: automatic formation of a bar code in accordance with standard international standard sizes; automatic printing
the set number of given labels; ensuring work offline and under computer control; input of initial data from the keyboard of the device or automatically via communication lines from a computer; control of the formation and printing of machine - and visually readable information with the issuance of error messages; correction of erroneous information; design and cutting labels of the required sizes.
There are several types of barcode printers in use around the world . Barcode printers differ in terms of printing principle and performance (label printing speed). By the principle of printing, thermal and thermal transfer printers are distinguished .
The former create an image similar to a fax machine printer, using the principle of thermal printing. The principle of thermal printing has been around for a long time. It arose long before the advent of computer technology. Thermal paper is an ordinary paper sheet coated with a thermosensitive film several microns thick. When exposed to temperature, the heat-sensitive film melts, the coloring matter and the reagent, which were in the solid state, react. The result of the reaction is a blue or black image.
Thermal printers are cheaper, except for the labels themselves, they do not need consumables, but the material from which the labels are made is special thermal paper, the image on which is very
sensitive to heat, and the label will darken over time. The appearance of one of the models of a thermal barcode printer is shown in fig. 1.11.

Rice. 1.11. Appearance of a thermal barcode printer
Thermal transfer printers can use any paper on which the image is applied using a hot thermal head from a special ink ribbon installed in the printer. The ink is applied to the label as it is drawn between the thermal head and the pressure roller inside the printer.
The image produced by a thermal transfer printer is more durable and less affected by environmental influences (sunlight, high temperature, etc.) than thermal paper. In addition, the tape can be of different colors, and the image is not smeared under mechanical stress. However, the cost of a label printed with a thermal transfer method is slightly higher than a similar label printed with a thermal method. The appearance of one of the models of a thermal transfer barcode printer is shown in fig. 1.12.

Rice. 1.12. Appearance of a thermal transfer barcode printer

barcode printers presented above are capable of satisfying almost any user need: from portable printers that print labels “on the go” in single copies without connecting to a computer, to desktop “mini-printing houses” for prompt printing of relatively large runs of stickers that carry any information necessary for a pharmacy .

At the same time, there are a number of requirements for applying a bar code to the packaging, established by international rules:

1) there must be one EAN barcode on the package;
2) the size of the code applied to the packaging must be from 80 to 200% of the original - base image;
3) the bar code is placed on the back of the package in the lower right corner at a distance of at least 20 mm from the edges, if this is not possible, then the bar code is applied on the right side of the front side;
4) on curved surfaces, the bar code is placed vertically; on plastic packages and packages , the barcode is applied to a more even surface;
5) bar code printing in black, blue, dark green or dark brown; light brown and yellow are not used, since the optical reader does not distinguish between them;
6) the background must be light, without drawings and perforations, text, white, yellow, orange or light brown.