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## **Features of forensic commodity examination of upholstered and cabinet furniture**

*The main task solved by forensic experts while studying furniture is to define its quality conditioned by a complex of consumer properties formed in the process of manufacturing and maintenance of such furniture.*

*The purpose of this article is to study main signs allowing to identify falsification or counterfeiting of furniture, and requirements for labeling.*

*The upholstered furniture of the provided manufacturer is characterized by the following features: a frame is made of natural wood, dried automatically in compliance with all norms and standards; particular attention is drawn to the quality of components; high-quality foam rubber is used to fill the mattress blocks which are tested for elasticity, wear resistance, certification, etc. Cabinet furniture of the provided manufacturer has the following characteristics: high quality workpieces, smooth, without knots along the entire length of a saw cut; wood edges are straightened at all areas of parts; when drilling attachment holes, the vertical and horizontal drilling accuracy is strictly controlled; furniture fittings correspond to a general artistic decision of furniture, have a long service life.*

*When conducting a forensic commodity examination of furniture, it is proposed to carry out its research in the following sequence: identify product characteristics, dimensional characteristics, shortcomings, causes of defects and their nature by the method of organoleptic examination and linear measurements; the method of comparative research establishes compliance or non-compliance of a studied product with regulatory requirements set for products of this commodity group, presence of defects in semi-finished products, quality of wood drying process, execution of the wood sawing process*

and manufacture of parts, quality of the process of manufacturing a frame, upholstery and finishing.

When evaluating the quality of furniture, it is needed to take into account their compliance with requirements, governed regulations for design, standards and other documents.

**Keywords:** cabinet furniture, upholstered furniture, defects, boxes, decorative fittings, fastening materials.

**Formulation of Research Problem.** In the modern world, furniture is not only a vital necessity, but also a luxury item, an exclusive part of the interior. Despite the economic and political troubles, in our country there is an increase in furniture production, improving the quality of their range.

As of today, domestic products cannot fully compete with foreign ones. However, recently the furniture market of Ukraine is increasingly filled with furniture products of domestic manufacturers who are trying to meet the needs of modern consumers, however, there is still something to learn from foreign competitors. Ukraine imports furniture mostly from Poland, Italy and Germany, and the number of imports is at a high level.

The peculiarity of the study of furniture is due to the variety of materials from which the product is made. The main task solved by forensic experts while studying furniture is to define its quality conditioned by a complex of consumer properties formed in the process of manufacturing and maintenance of such furniture.

**Analysis of Essential Researches and Publications.** Some provisions of furniture examinations were studied in the works by O. O. Zhelavska <sup>1</sup>, I. M. Baidakova, L. M. Huba, H. M. Kozhushko, O. I. Peredrii, S. V. Yaheliuk <sup>2</sup> and others, however, they did not consider the full range of forensic commodity examination of furniture, and the lack of a single set of rules for forensic commodity examination of furniture makes it difficult to conduct such researches.

The **Article Purpose** is to study main signs allowing to identify falsification or counterfeiting of furniture, determine the main characteristics of the goods of this group and the requirements for their labeling, as well as the algorithm of actions during the research of upholstered and cabinet furniture.

**Main Content Presentation.** The choice of the nomenclature of indicators on which to conduct research on the quality of furniture products, experts carry out in accordance with DSTU 16371-93 *Furniture. General technical conditions*, GOST 20400-80 *Products of furniture production. Terms and definitions*.

Furniture is classified by various features. Here are the main ones:

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<sup>1</sup> Желавська О. О. Розрахунок втрати якості непродовольчих товарів у зв'язку з їх зносом та наявністю дефектів : метод. рек. Київ, 2011. 34 р.

<sup>2</sup> Байдакова І. М., Губа Л. М., Кожушко Г. М., Передрій О. І., Ягелюк С. В. Товарознавство непродовольчих товарів : підруч. для студ. вищ. навч. закл. : у 2-х ч. Ч. І. Луцьк, 2014. 355 р.

- by operational properties (household, office, for public catering establishments, rest homes, sanatoriums, country houses);
- by design (cabinet, prefabricated, demountable, non-demountable, mounted, sectional, hinged, bent, wicker);
- by type of manufacturing material (wooden, polymer, metal, combined);
- by type of product (cabinets, chests of drawers, sideboards, tables, beds, sofas, stools, chairs, armchair, dressing table, trellises, benches);
- on functional features (for sitting, lying down, work; storage of clothes, utensils, books);
- by completeness (single, complete);
- by nature of production (experimental, serial, mass);
- by the method of production (carpentry, bending, wicker, extruded, molded, stamped, cast);
- by the magnitude of the deformation of the soft element (hard, soft) <sup>1</sup>.

Let's dwell in more detail on the features of commodity examination of upholstered and cabinet furniture.

Examination of the production and determining the quality of upholstered and cabinet furniture is a complex process that requires special knowledge. During the forensic examination of furniture, it is proposed to conduct their examination in the following sequence:

1. The method of organoleptic inspection and linear measurements establishes the commercial characteristics of the product (variety, model, design, materials used), dimensional features, downsides (defects, their location, degree of detection), the cause of defects and their nature (raw materials, production, operation).
2. The method of comparative research determines the compliance or non-compliance of the examined product with the regulatory requirements for products of this product group, the presence of defects in the semi-finished product, the quality of the wood drying process, the quality of the sawing process and manufacturing of parts, the quality of the process of manufacturing the frame, the quality of the upholstery process furniture and decoration of cabinet furniture.

Examination of a particular product begins with its thorough inspection by a commodity expert. As a result of the inspection, the specialist establishes the product characteristics (color, model, wood processing, brand of components, product grade), method of cutting upholstery fabric for upholstered furniture, dimensional data that allow to classify the object.

The next step is to inspect the product for defects. To determine the degree of their expression, it is necessary to determine the location. Establish the nature of defects of materials from which the furniture is made, or which were formed

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<sup>1</sup> Алексеев Н. С. Товароведение хозяйственных товаров : учеб. для вузов : в 2 т. 3-е изд., испр. и доп. Москва, 1989.

during storage, transportation and operation, and their impact on product quality (hidden defect, significant, insignificant, remedial, irreversible, critical). In practice, the percentage of wear can be calculated based on the service life or specific defects: abrasions and scratches, chips on the edges of parts, violations of adhesive joints, the presence of cracks and gaps, deformation of soft elements, breaks in upholstery at seams, through cracks and swelling material, etc.

During the forensic commodity examination, an expert should take into account that the destruction of furniture can occur due to improper care for them, errors during cleaning and operation (Fig. 1).

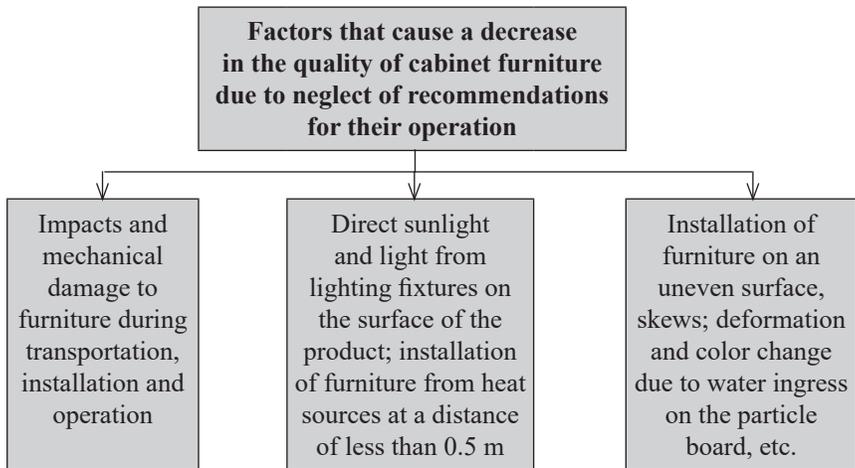


Fig. 1. List of factors that reduce the quality of furniture during operation

### ***Features of the examination of upholstered furniture***

The most important classificational features of upholstered furniture are the functional purpose and the presence of a soft element (from I to IV category of softness). Upholstered furniture has a number of requirements, compliance with which meets the specific needs of the consumer in accordance with their purpose. These requirements concern the observance of quality indicators regulated by regulatory documentation and the assessment of product quality by objective technical, economic and organoleptic properties, which are grouped into the following groups: architectural and artistic (aesthetic); efficiency (product price, consumption price); comfort and ergonomics (functional solution of the product); modern design; compliance with the requirements of DSTU; safety (environmental friendliness and hygiene); reliability, durability and maintainability <sup>1</sup>.

<sup>1</sup> Дослідження показників якості при виробництві меблів. 2014. URL: <https://student.zoomru.ru/tovar/dosldzhennya-pokaznikv-yakost-pri-virobniactv/280516.3319781.s1.html> (date accessed: 25.02.2021).

Production of upholstered furniture is carried out in stages. The first stage is the manufacture of the frame. The second stage is the upholstery of the product. Since the factory process is an organized cycle of work, the stages of production have a clear sequence.

For production of the skeleton framework a wooden bar (natural wood), particle board, fiberboard are used. Natural wood attracts special attention of the commodity expert (first of all technology of a bar drying). Such attention is quite justified, because this process is directly related to the quality of the final product. Examining the technological process of drying, the expert commodity dwells on its features. If the drying process is automated, it guarantees the stability of the parameters (temperature, humidity, etc.), because a special recorder records data on the humidity of the wooden beam, as soon as a certain mark is reached, the drying process automatically stops. The beam, dried in compliance with all technological requirements, is considered environmentally friendly, the material does not mold, does not suffer from fungus, it is not sharpened by beetles, as the latter are absent in the wood prepared in this way. Under such conditions, the strength and durability of wooden beams are provided for many years of operation. After drying, the wooden beam is transported to the carpentry shop, where it is used to make frame elements. The main stages in the carpentry shop are also automated. This ensures reliable fixing when sawing the beam, accurate calibration of workpiece widths and heights, etc. The commodity expert should take into account that particle board and fiberboard are used when the use of natural wood is technologically impossible.

At the key stages furniture production there is a technical control department (hereinafter referred as *TCD*). If *TCD* employees find violations of the quality standards of the frame or the finished product, such frame or finished product is returned for revision. The fact that the product is accepted is evidenced by a glued paper label containing the following information: a trademark, the name of the manufacturer and his address; a product name; the order name; product release date; designation of the standard; *TCD* stamp. In addition, the product is equipped with a warranty card, according to which the customer can read the recommendations for the care of upholstered furniture, the rules of their operation, the conditions of warranty and post-warranty service <sup>1</sup>.

One of the decisive criteria for choosing a sofa by the consumer is the appearance, which is determined by the shape, dimensions and, of course, the upholstery material. The cover itself gives the sofa an attractive, stylish look and allows you to significantly improve its consumer properties. As of today, three basic types of upholstery are used in the production of upholstered furniture:

- textiles;
- artificial leather;
- genuine leather.

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<sup>1</sup> Петрова І. А. Експертне дослідження меблів при проведенні судово-товарознавчих експертиз. *Право і суспільство*. 2011. № 6. Р. 191—196.

The most expensive is genuine leather. It is characterized by softness and strength, elasticity and resistance to deformation. The skin is pleasant to the touch, breathable, stays cool in the heat and warm in the cold. It is not prone to stains, it is easy to clean and polish. Modern reagents used in its manufacture make it environmentally friendly and hypoallergenic. Dyeing technologies allow you to give the skin any desired shade, as well as apply a textured pattern or relief<sup>1</sup>.

Artificial or so-called eco-leather can be a budget alternative to genuine leather. In its properties it is similar to natural, and in some respects even surpasses it. For instance, sofas made of imitation leather are much more resistant to light and less demanding in care. Today, manufacturers have learned to very accurately copy the natural pattern of the skin, its softness and plasticity. It is difficult for a layman to determine that in front of him is a man-made fabric. Therefore, furniture, upholstered in artificial leather, in general, looks no less advantageous. At the same time, the price for them, of course, is much lower.

Most often, among the upholstery materials used textiles. Fabrics are created from natural and synthetic fibers in different proportions. The most common: flock, chenille, velour, jacquard, mat (Fig. 2).

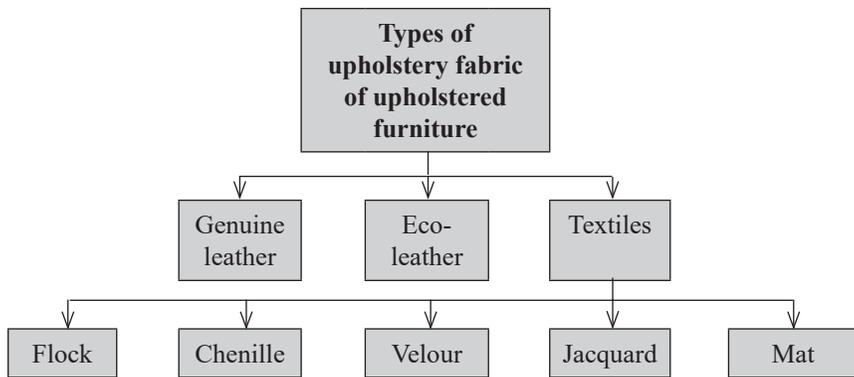


Fig. 2. The most common types of exterior upholstery fabric for sofas

### ***Features of the study of cabinet furniture***

Cabinet furniture – a piece of furniture that has a *drawer* design and is designed to be located along the walls. This category includes: tables, shelves, wardrobes, cabinets, walls and other types of furniture made of individual hard parts.

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<sup>1</sup> Як вибрати диван: особливості матеріалів оббивки. URL: [http://promebli.org.ua/yak-vybraty-dyvan-osoblyvosti-materialiv-obbyvky.html#mor\\_e-762](http://promebli.org.ua/yak-vybraty-dyvan-osoblyvosti-materialiv-obbyvky.html#mor_e-762) (date accessed: 20.02.2018).

First of all, these are the upper, lower, and side panels, which are the main elements of the cabinet furniture. Stiffness of connection is provided by couplers, confirmats, pins, and other accessories providing real estate by connection of elements of furniture. Cabinet panels are made of particle board, rear walls — fiberboard.

Shelves (depending on the method of fastening) are divided into stationary (non-removable) and removable. Stationary shelves are designed for books, clothes, utensils. Non-removable shelves are rigidly fixed between the frame panels, which protects the furniture from diagonal distortions. Stationary shelves, as well as cabinet elements, are made of particle board. Removable shelves can be made of particle board or glass.

The door is the front part of the furniture, the facade. In their manufacture there is a variety of materials: particle board, MDF, glass (in particular, frosted and sprayed). For door decoration use various overhead elements, decorative accessories. Doors not only protect things from the environment, but also provide access to them. Depending on the movable method of connecting the door to the furniture body, they can be plowed (hinges are used for connection) or sliding (roller mechanism and metal guides are used).

Drawers — an indispensable attribute of any of the models of cabinet furniture. Drawers are decorated similarly to doors. They are put forward thanks to directing rollers.

**Main signs allowing to identify falsification or counterfeiting of furniture**

*Upholstered furniture from real manufacturer is characterized by the following features:*

1. The frame of the products is made of natural wood. In the process of preparation, the wooden beam is dried automatically in compliance with all norms and standards. The result is an environmentally friendly material that has high strength and durability.
2. To give the product the desired shape, the curved details of upholstered furniture are upholstered with fiberboard.
3. When choosing components for products at a furniture factory, special attention is paid to their quality. This takes into account the technology of production of components, in particular, the brand of metal, the presence of galvanization, method of painting, etc., as well as compliance of components with generally accepted norms and standards, terms and conditions of guarantees provided by the manufacturing factory, the authority of the brand.
4. To fill mattress blocks ST 2542 foam rubber is used. At the manufacturing factory, each batch of foam rubber, which is delivered to the furniture factory, passes special tests for elasticity, wear resistance, recovery activity and certification. The same applies to spring blocks and beaded slats.

*Upholstered furniture of artisanal and low-quality factory production, the copied products can be defined on such signs:*

1. The frame is made of undried, i.e. wet beams. The design is short-lived, so it has a limited-service life. Due to the violation of the technology of drying the beam there is a high probability of fungus, mold, insects. Due to the violation of the technology of drying the beam there is a high probability of fungus, mold, insects.
2. Cardboard is used for upholstery of curved upholstered furniture details. This material is short-lived, so the product usually quickly loses its shape.
3. The components are made in violation of the production technology: low grade of metal, no galvanization, low-quality painting, bolts for cleaning the elements of the frame are not cleaned from oil, which leads to contamination of the cover, and so on. The brand of the component manufacturer is not marked.
4. Soft element of low density. This means that in a year or two it will start to sag, crumble, wrinkles and cracks will appear on the surface of the upholstery. Cheap springs will make themselves felt even earlier. In addition, they will begin to creak.
5. Cheap upholstered furniture has an unattractive appearance, because the upholstery is of low quality, poorly draped. During operation, the consumer may find the following shortcomings in the furniture: the material quickly fades and wears out, it is poorly cleaned, the seams spread. In addition, the upholstery material may contain a significant amount of synthetics, and dyes — harmful components to human health.

*Cabinet furniture of the real manufacturer* has the following characteristics:

1. Due to use of the modern equipment and automation of production processes, in particular a stage of sawing of a particle board, preparations have high quality: smooth, without knots on all length of cutting.
2. The edges are lined on all parts, in particular on the *invisible* (for example, the lower sides of the lower doors, the upper sides of the upper doors, etc.).
3. Drilling of connecting holes is strictly controlled by vertical and horizontal accuracy of drills. Observance of these parameters provides easy and operative assembly of cabinet furniture at home.
4. The furniture correspond to the general artistic decision of furniture, has long service life, is beautiful, convenient in use and demands a minimum of care.

*Cabinet furniture of artisanal, low-quality factory production, copied products* can be identified by the following characteristics:

1. Due to the use of old or cheap equipment, blanks have knots, there is a violation of the texture of the material. All this has a negative effect on the appearance of the product and its performance characteristics.
2. The facing edge is not present on all sites of detail.
3. When assembling cabinet furniture, the consumer finds a violation of the vertical and horizontal accuracy of the drills.
4. The furniture looks simple. Details of one category can differ in the sizes, color of material.

5. Deformation of the guide parts of the product (it is difficult to fully extend the drawer, slide the sliding door in the closet), etc.

**Requirements for furniture labeling**

Each piece of furniture must have a marking which is applied for identification on a paper label firmly glued to the product in a typographical way. It is allowed to apply indelible paint marking by stamping, pyrography, firing, punching.

The labeling must be clear and contain the following information:

- the name of the manufacturer, its location (city or conditional address) and the trademark;
- name of the product;
- date of production;
- warranty period, expiration date;
- designation of the standard;
- material of manufacture;
- type of upholstery;
- image of the quality mark (Fig. 3).



Fig. 3. General view of the label of drawers with the appropriate markings

Markings shall be applied to the upper left corner of the rear wall on products intended to be placed against the wall, on the reverse side of the table cover, on a surface invisible during operation in products without a rear wall or cover. Marking on the surface of drawers, adjustable shelves, parts and components that can be replaced is not allowed. All furniture that is part of the set, headset, next to the label must be marked with a symbol or number indicating that the product belongs to the set or garniture <sup>1</sup>.

The dimensions of the labels on which the furniture is marked must be at least A7 (74 × 105 mm). The design of labels may be done in accordance with the procedure for marking household furniture.

<sup>1</sup> Формування споживних властивостей меблів та митне оформлення при перетині митного кордону. 2017. URL: <https://www.docsity.com/ru/formuvannya-spozhyvnyh-vlastivostey-meblyiv-ta-mitne-oformlennya-pri-peretyni-mitnogo-kordonu/1428028> (date accessed: 20.02.2018).

**Conclusions.** Therefore, during the manufacture of furniture, their consumer properties may deteriorate due to violations of production technology, the use of poorly adjusted and worn equipment, slovenliness or insufficient qualifications of performers. The price of furniture depends on the type of product, its design, size, quality of basic and facing materials, decoration, softness category of furniture elements.

When assessing the quality of furniture products, it is necessary to take into account their compliance with all the above requirements, regulated by design standards, state standards and other documents. The article identifies the features and presents the sequence of forensic commodity examination of upholstered and cabinet furniture which will provide better conclusions and increase their evidence base.

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### **В. В. Серединський, І. М. Новицька** **Особливості товарознавчого дослідження** **м'яких та корпусних меблів**

*Основним завданням, яке вирішують експерти під час дослідження меблів, є визначення їхньої якості, зумовлене комплексом споживчих властивостей, що формуються у процесі їх виготовлення й експлуатації.*

Метою цієї статті є вивчення основних ознак, які дають змогу виявити фальсифікацію або підробку меблів, і вимог до маркування.

Під час виконання судово-товарознавчої експертизи меблів слід проводити їх дослідження, використовуючи метод органолептичного огляду та лінійних вимірювань і метод порівняльного дослідження для встановлення відповідності виробу нормативним вимогам, що висувають до виробів цієї товарної групи.

**Ключові слова:** корпусні меблі, м'які меблі, дефекти, шухляди, декоративна фурнітура, кріпильні матеріали.

**В. В. Серединский, И. М. Новицкая**

### **Особенности товароведческого исследования мягкой и корпусной мебели**

Основной задачей, решаемой экспертами в ходе исследования мебели, является определение её качества, обусловленного комплексом потребительских свойств, которые формируются в процессе изготовления и эксплуатации такой мебели.

Целью данной статьи является изучение основных признаков, позволяющих выявить фальсификацию или подделку мебели, и требований к маркировке.

Мягкая мебель настоящего производителя характеризуется следующими признаками: каркас выполнен из натурального дерева, высушивается в автоматическом режиме с соблюдением всех норм и стандартов; особое внимание уделяют качеству комплектующих; для наполнения матрасных блоков применяют качественный поролон, который проходит специальные тесты на эластичность, износостойкость, сертификацию и др. Корпусная мебель настоящего производителя имеет следующие характеристики: заготовки высокого качества, гладкие, без сучков по всей длине пропила; кромки облицованы на всех участках деталей; при сверлении соединительных отверстий строго контролируется вертикальная и горизонтальная точность сверлений; фурнитура соответствует общему художественному решению мебели, имеет длительный срок эксплуатации.

При выполнении судебно-товароведческой экспертизы мебели предлагается проводить её исследования в следующей последовательности: методом органолептического осмотра и линейных измерений устанавливаются товарные характеристики изделия, размерные признаки, недостатки, причины возникновения дефектов и их характер; методом сравнительного исследования устанавливают соответствие или несоответствие исследуемого изделия нормативным требованиям, предъявляемым к изделиям этой товарной группы, наличия дефектов полуфабриката, качества выполнения процесса сушки древесины, выполнения процесса распила древесины

и изготовления деталей, качества выполнения процесса изготовления каркаса, обивки и отделки.

При проведении оценки качества мебельных товаров необходимо учитывать их соответствие требованиям, регламентированным нормами проектирования, стандартами и другими документами.

**Ключевые слова:** корпусная мебель, мягкая мебель, дефекты, ящики, декоративная фурнитура, крепёжные материалы.

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## **C**ontributors

The authors contributed solely to the intellectual discussion underlying this paper, case-law exploration, writing and editing, and accept responsibility for the content and interpretation.