

## PROCESS OF CREATING CONSTRUCTIVE SOLUTIONS OF CLOTHES BASED ON THE MODULAR DESIGN

### ПРОЦЕСС СОЗДАНИЯ КОНСТРУКТИВНЫХ РЕШЕНИЙ ОДЕЖДЫ НА ОСНОВЕ МОДУЛЬНОГО ПРОЕКТИРОВАНИЯ

*A.O. RUSTEMOVA, M.A. NURZHASSAROVA, A.Zh. TALGATBEKOVA, A.M. SABITOVA, Zh. E. DANADILOVA  
A.O. РУСТЕМОВА, М.А. НУРЖАСАРОВА, А.Ж. ТАЛГАТБЕКОВА, А.М. САБИТОВА, Ж.Е. ДАНАДИЛОВА*

(Almaty Technological University, Republic of Kazakhstan)  
(Алматинский технологический университет, Республика Казахстан)  
E-mail: aigulya1105@mail.ru

*The article consider the stages of the development process of modern clothing patterns based on the traditional national costume using modular design principles. The algorithm of research of the creative source for the purpose of deriving modular elements was proposed, which contributes reducing the time of running of the model in production.*

*В статье рассматриваются этапы процесса разработки моделей современной одежды на основе традиционного национального костюма с использованием принципов модульного проектирования. Предложен алгоритм исследования творческого источника с целью выделения модульных элементов, способствующий сокращению сроков запуска модели в производство.*

**Keywords:** costume, module, modular design, traditional national costume, modern clothes.

**Ключевые слова:** костюм, модуль, модульное проектирование, традиционный народный костюм, современная одежда.

It is known that the development of constructive solutions of competitive clothing based on traditional national costume (TNC) is possible on the basis of the operational methods of knowledge and non-operational mechanisms of the creative thinking [1].

For the establishment of modern clothing patterns based on TNC the authors [2], [3] propose the method of reconstruction using heuristic techniques and similar transformations (by analogy).

These transformations consistent with the principle of modular design, where in order to create new solutions the conditional unit-element of an object of the study is used as the module and it performs certain functions.

The main objective of the modular design is to create a new project of making clothes with a reduced startup cycle models into pro-

duction. The advantages of the modular design include: manufacturability, efficiency of patterns layout and lower consumption of material [4], [5]. Furthermore, the use of modules even most simple geometric shapes in the organization of costume form allows creating complex volumes in the product as a whole and in the individual elements [6].

Note, however, that in the process of development of modern models based on traditional costume during the use of various transformation techniques there is an important aspect of maintaining the authenticity (or conformity) of the object of study.

It is necessary to determine the degree of deviation from the traditional forms and methods of processing and the technics of decoration depending on the functional purpose of the new model. That is important to

establish the boundaries of the visual "recognition", beyond which the costume is not identified as a carrier of features of a particular ethnic style by potential consumer. Therefore, the models created on the basis of TNC must be maintained in varying degrees, how to use the traditional cut and decor, character of combinations of materials and colors, the processing methods.

An analysis of the forms and constructions of various types of clothing in traditional national costume (TNC) has shown that the basic silhouette forms of shoulder clothes are straight, trapezoidal, semi fitted and for belt clothes are straight. In fact all of them act as modules, within which possible to make various modifications [1], [7].

The nature of the division of forms of traditional folk costumes, which determines the proportional ratio and size of its components (modules), is subject to certain consistent patterns [1], [7...9].

Creation a new design and technological solutions of clothes based on the object of research (TNC), based on such principles of modular design (MD) as a constructive, decorative and technological.

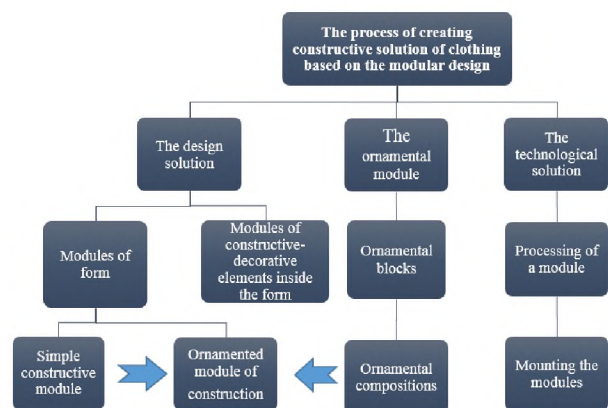


Fig. 1

Generalized scheme of the MD of modern costume based on TNC can be represented as follows (Fig. 1): the selection of modules based on the proportioning, the arrangement of the modules, taking into account the functional purpose of the object of design, technological processing and setting-up the modules, the development of transformable models and similar models from the sets of standardized parts-modules.

The constructive principle provides for the development of constructive solutions of designed object from separate typed modules-blocks on the basis of module of shapes and constructions of the elements of the research object (TNC).

Decorative principle provides development of decorative modules of designed object on the basis of units (module) of the ornament to create a whole ornamental compositions of modules blocks, execution of ornamental compositions, depending on the type of ornament, based on techniques of its performing and the location in the TNC.

The technological principle involves the use of rational methods of processing and assembly modules to each other using both traditional and modern methods.

It is known that the formation of a new form of the costume based on the creative source is split into several consecutive steps [1], [10].

In the process of the MD at the initial stage it provides a quantitative analysis of the object of study (TNC), that is the definition of modular elements parameters using decomposition techniques. Quantitative and qualitative analysis of the costume elements is performed: construction, size and shape of the parts (modules), the completeness from parts of clothes and types of materials used.

Further, in order to develop decorative solutions of designed object a qualitative analysis of the research object is held, namely, the character and method of execution and the location of the modular elements of decor (angular, all-over, single, side), color patterns of the composition, the principles of compatibility of materials for decoration.

Thus, in determining the constructive solutions of each of the garment units in the TNK formed the background information, based on the complex of the works:

- Identify the location of the modules.
- Defining geometrical form of modular elements.
- Determining the frequency of occurrence of modular elements of the research object (TNCs).
- Establishing a proportional relationship between the parameters (width, length) in the

module, between the individual modules as well as between the module and a separate unit as a whole costume.

As a result of the principles of modular design on the basis of the research object (TNC), creating a new model, we propose the following sequence of actions:

- definition of a typed module size that is proportional to the size (or the same size) of the selected item in the object of study;
- establishing the location and the characteristics of decor (type of ornament, the volume and size of the main elements of the ornament, filling density of the ornamental field, performing technique, color combinations, the presence of additional finishing);
- identification the possibility of creating interchangeable elements or transformed elements of the object of study (TNC) in order to extend the functionality of the module and the model.

It is obvious that each step of presented algorithm of actions required to create a new algorithm to an appropriate level, for example, to identify the size and proportions of the object of study (TNC).

There are various ways to transfer constructive and decorative features of the object from sketches to model, one of which - the imposition of structural support lines (grid) to the body mannequin [8].

Depending on the appearance of the object of study (photo of the exhibit, located on a mannequin or on the plane surface, a historical sketch from nature) must use suitable methods of determining the constructive and decorative attributes and sizes of modules in the object of study (TNC).

For example, in determining the true size of the prototype, in this case, the elements of TNC dressed on a mannequin, it is proposed to perform the photo of the objects in three positions - front, back and lateral side. After this correction of the conversion factor of planar measurement with photos in the measurement values of the corresponding bulk forms is calculated.

With such a limited resource, as a historical sketch of TNC from nature, to approximate the size of the parts, can be used systems of proportioning and measures based on the size of certain body parts (elbow, wrist, etc.) [11].

Thus, we propose the process of modular design when creating the design and technological solutions of modern clothing patterns based on TNC, conducting an adequate transport and transformation of the characteristics of the research object (traditional national costume), in order to preserve its life cycle in models designed in modern conditions.

## CONCLUSIONS

1. It was established that application of modular approach when designing clothes based on traditional folk costume meets the requirements of need to expand and rapid change of the range, the unification of the individual components and assemblies, as well as the search for new and innovative forms while preserving national identity in the modern costume.

2. The algorithm of the process of modular design of modern clothing models based on TNC, allowing to carry out adequate transport and transformation of the specific signs the object of study (traditional national costume) is offered.

## BIBLIOGRAPHY

1. *Нуржасарова М.А.* Теоретические и методологические принципы проектирования современной одежды на основе традиционного казахского костюма: Дис. ... докт. техн. наук. – Алматы, 2005.
2. *Нуржасарова М.А., Смайлова У.У., Талгатбекова А.Ж., Тунгатарова Д.Т.* Теоретические принципы проектирования одежды с использованием метода аналогии // Изв. вузов. Технология текстильной промышленности. – 2015, №3. С.119...122.
3. *Нуржасарова М.А., Талгатбекова А.Ж., Рустемова А.О., Скарьдова В.Б.* Процесс создания конструктивных решений одежды с помощью эвристических приемов // Изв. вузов. Технология текстильной промышленности. – 2015, №4. С.125...127.
4. *Звягинцев С.В.* Разработка методов комплексного проектирования комплектов видоизменяемых и трансформируемых предметов одежды: Дис. ... канд. техн. наук. – М., 1999.
5. *Обедина С.В., Быстрова Т.Ю.* Модульный принцип формообразования в дизайне // Академический вестник УралНИИПроект РААСН. – 2013, №1. С. 85...90.
6. *Баландина Е.А.* Алгоритм построения сложной пространственной формы на основе метода

трансформационной реконструкции костюма // Актуальные проблемы гуманитарных и естественных наук. – 2015, №12-2. С.9...12.

7. *Талгатбекова А.Ж.* Разработка методики проектирования современной одежды с использованием эвристических приемов: Дис...канд. техн. наук. – Алматы, 2010.

8. *Пармон Ф.М.* Композиция костюма. Одежда, обувь, аксессуары. – М.: Триада плюс, 2002.

9. *Шатковская М.Л.* Формирование элементарного базиса прототипов при проектировании одежды на основе народного костюма: Дис. ... канд. техн. наук. – СПб., 2009.

10. *Виниченко Е.В., Евдущенко И.В.* Новый подход к категориальному анализу исторического костюма как творческого источника проектирования современных моделей одежды // Альманах современной науки и образования. – Тамбов: Изд-во Грамота, 2012, №11. С. 35...39.

11. *Фот Ж.А.* О создании модуля художественного проектирования с использованием систем пропорционирования в САПР // Фундаментальные исследования. – 2008, № 5. С. 50...51.

#### REFERENCES

1. Nurzhasarova M.A. Teoreticheskie i metodologicheskie principy proektirovanija sovremennoj odezhdy na osnove tradicionnogo kazahskogo kostjuma: Dis. ... dokt. tehn. nauk. – Almaty, 2005.

2. Nurzhasarova M.A., Smajlova U.U., Talgatbekova A.Zh., Tungatarova D.T. Teoreticheskie principy proektirovanija odezhdy s ispol'zovaniem metoda analogii // Izv. vuzov. Tehnologija tekstil'noj promyshlennosti. – 2015, №3. S. 119...122.

3. Nurzhasarova M.A., Talgatbekova A.Zh., Rustemova A.O., Skar'dova V.B. Process sozdaniya konstruktivnyh reshenij odezhdy s pomoshh'ju

jevristical'nykh priemov // Izv. vuzov. Tehnologija tekstil'noj promyshlennosti. – 2015, №4. S.125...127.

4. Zvjagincev S.V. Razrabotka metodov kompleksnogo proektirovanija komplektov vidov izmenjaemykh i transformiruemykh predmetov odezhdy: Dis. ... kand. tehn. nauk. – M., 1999.

5. Obednina S.V., Bystrova T.Ju. Modul'nyj princip formoobrazovanija v dizajne // Akademicheskij vestnik UralNIiproekt RAASN. – 2013, №1. S.85...90.

6. Balandina E.A. Algoritm postroenija slozhnoj prostranstvennoj formy na osnove metoda transformacionnoj rekonstrukcii kostjuma // Aktual'nye problemy gumanitarnykh i estestvennykh nauk. – 2015, №12-2. S.9...12.

7. Talgatbekova A.Zh. Razrabotka metodiki proektirovanija sovremennoj odezhdy s ispol'zovaniem jevristical'nykh priemov: Dis...kand. tehn. nauk. – Almaty, 2010.

8. Parmon F.M. Kompozicija kostjuma. Odezhda, obuv', aksessuary. – M.: Triada plus, 2002.

9. Shatkovskaja M.L. Formirovanie jelementnogo bazisa prototipov pri proektirovanii odezhdy na osnove narodnogo kostjuma: Dis. ... kand. tehn. nauk. – SPb., 2009.

10. Vinichenko E.V., Evdushhenko I.V. Novyj podhod k kategorial'nomu analizu istoricheskogo kostjuma kak tvorcheskogo istochnika proektirovanija sovremennykh modelej odezhdy // Al'manah sovremennoj nauki i obrazovanija. – Tambov: Izd-vo Gramota, 2012, №11. S. 35...39.

11. Fot Zh.A. O sozdanii modulja hudozhestvennogo proektirovanija s ispol'zovaniem sistem proporcionirovanija v SAPR // Fundamental'nye issledovaniya. – 2008, № 5. S. 50...51.

Рекомендована кафедрой технологии, конструирования изделий и товаров. Поступила 18.06.16.