USE OF BODY PROPORTIONING SYSTEMS IN DESIGNING NEW MODELS OF JACKETS FOR GIRLS AGED 3 … 6,5 YEARS

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Abstract: *The particularities of children's silhouettes are determined, first of all, by differences in the proportions of main elements. It is known that namely the proportions of silhouette represent the biggest age-related variability and affect the perception of silhouette in general.*
Therefore, the main objective of this work was to study the body proportioning systems for choosing a system capable of transposing its harmonization principles on the silhouette in general and the product in particular.
The problems considered in this work are actual, as the manufacturing of garments for children occupies a substantial share of textile industry. Garments for children are always highly demanded, as they need frequent renewal due to wearing particularities.
In the result of performed study, two systems of jackets for girls have been elaborated. All the external characteristics of models have been elaborated using the «golden ratio» rule that allowed to provide a harmonic external appearance adapted to the anthropomorphological characteristics of a child of preschool age.

Keywords: *proportioning systems, design of jackets, children of preschool age.*

INTRODUCTION

When elaborating the package of initial data for constructing garments, including garments for children one must properly understand not only the dimensions of silhouette, but also its proportions and constitution. Namely these indicators allow to include all the necessary changes into the construction at the initial stage so as to comply to the maximum extent with the particularities of specific silhouette.
The group of preschool age children as the one with the most changeable silhouettes is also characterized by specific operation of locomotion and other vital systems compared to the organism of an adult person and this is significant challenge for the design of adequate clothing [1].
One may affirm that the children are a separate group of wearers and establish the main problem of the designer: to design clothing taking into consideration all the age-related particularities for each age group.

ASPECTS OF DESIGNING GARMENTS BASED ON PROPORTIONALITY RELATIONS

Being the basis of structure of any product of art, proportions are a tool of artistic expression of objectively existing relationships in nature. The absence or failure to comply with the proportions results in the loss of harmony and integrity of depicted object. In practice, especially in architecture appeared numerous proportioning systems. So, for Ancient Epoch numeric and visually perceivable proportions were characteristic, for the Medieval Gothic – geometrical, immeasurable in numbers, hidden proportions, in the Renaissance epoch the leading notion of perfect proportion was the Golden Section widely applied in sculptural art. The study of proportions includes the main laws of suit composition: statics and dynamics, symmetry and asymmetry, rhythm and plastics [2].

In order to establish the required proportions in clothing an important element is the determination of product length and location of waistline. The different visual perception of the same silhouette is explained by the different division method, i.e. different location of product waistline at equal length. The natural division of a proportional silhouette by the waist line into two components is expressed by the Golden Section.

The Golden section is the basis of harmonic shapes, as it is the absolute law of shapes in the nature we are parts of. IN this manner one may conclude that the proportional relationships are based on the inequality of

proportions. In the modeling of garments the proportional relationships are determined intuitively or set by the trends of fashion. Each direction of fashion implies its own proportional divisions of suit and of the man in that suit, accordingly.

Comfort is known to be of special importance for a child, but modern clothing is not always comfortable. Clothing must never interfere with the physiological development of children, it must be convenient both for the ergonomics and use of its separate elements. This is why when elaborating garments one is advised to determine the location of functional elements (divisions and constructive-decorative parts) with the particularities of constitution and proportions of children's silhouettes [3].

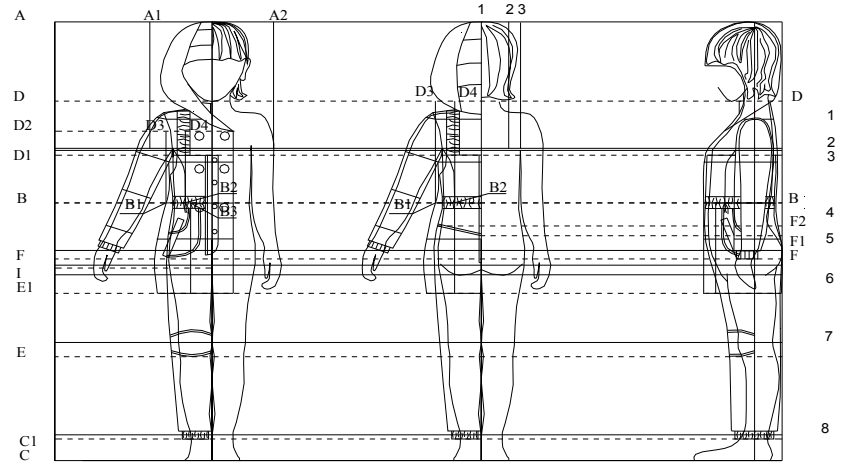
In the first period of childhood (4…7 years) the bones of skeleton grow tremendously and the body height increases (especially in the age of 5 to 7 years). The body proportions change. Changes occur mainly due to the reduction of relative dimensions of head and body and increasing relative length of extremities. The head height attains 1/6 of the body length. The speed of growth of the upper part of body decreases uniformly, as well as the length of feet, at the same time the length of arms and the body diameter increases (shoulders, fingers). Changes in the proportions of children's body parts in the process of growth are not uniform.

There are certain differences both in the constitution and entire external appearance within this age group of children. Two main silhouettes are characteristic for the clothing of girls belonging to this age group:
1) Extended to the lower end from shoulder or chest (A-like);
2) Free straight bodice extended at lower end (D-lile).
The first shape is obtained by elongated yoke, its line forms the raised waistline. The second shape is obtained by elongated bodice, its line lowers the waistline.

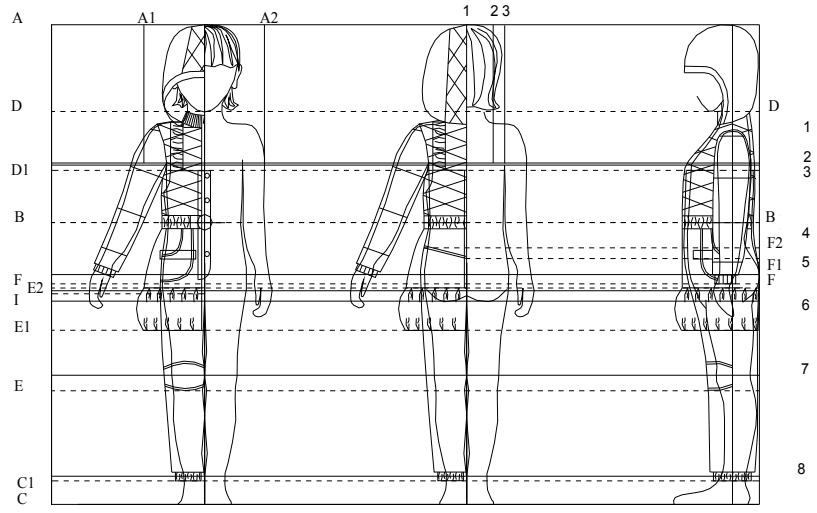
DESIGNING OF JACKETS FOR GIRLS BASED ON THE PROPORTIONING RELATIONSHIPS

GOST 17916-86 provides a quite large variety of common-type silhouettes in the examined age group, therefore the projection dimension signs of three common-type groups were examined: 98-56-51, 110-56-51 и 122-56-51.
The analysis of anthropometric measurements of girls of preschool age allowed to establish significant differences between the chosen common-type silhouettes affecting the visual perception of these silhouettes in the context of elaboration of harmonic models of garments. For these reasons it is proposed to divide the preschool age group into **two subgroups** and elaborate garments of various models for them in accordance with the anthropomorphological characteristics of silhouettes of each subgroup.
Jackets have been chosen as an object of design, as presently namely this type of products is the most preferred during the cold season – they have good thermal protection properties, provide efficient protection against wind and have a low weight, these are important characteristics for the children's wear.
As the main jacket fabrics are quite thin, it is possible to design inserts, tucks, frills. These materials are capable of holding the shape well, but the shape itself has to be obtained by constructive method, as the jacket fabrics do not shrink and do not support secondary thermal treatment.
The thermal protection functions of these products are assured owing to the use of additional thermal isolation materials. This allows to diversify the models additionally, as the thermal protection layer may be fixed on the basic fabric using simple or sophisticated padding.
Based on the main function of upper clothing – protection against cold – new models must have a certain length in order to provide for the ventilation of undercoat air layers – a specific volume provided by specially chosen values of constructive additions.
The analysis of common-type silhouettes of girls of preschool age has demonstrated that it is most suitable to elaborate models for the two subgroups with different proportions:
1. Common-type silhouettes of the height series 98...100 cm.
2. Common-type silhouettes of the height series 110…122 cm.
As the common-type silhouette of 110 cm is the intermediary ones and may use the models both for the first and second subgroup, since namely this common-type height has been taken as basis for the elaboration of new models of jackets for girls in this work.
Starting from the height of 98 cm the kids will appear best in the suits consisting of jackets and overall-type trousers, as they are very mobile and quickly growing, this will allow to use the product for several seasons in sequence. The garments for this age group is characterized by the following cut particularities as: folds, ruches, frills of various types, bodices, mostly straight silhouette lines.
The children of the second subgroup, starting from the height of 110 cm will appear more harmonically in longer jackets of specific cut, down to the knee line. Trapezoid silhouette jackets are preferred, with lower ruches, relief elements, bodices, horizontal and vertical padding, etc.

When elaborating technical sketches of models we used the Golden Section principles in order to harmonize the external appearance of wearers. Using the Fibonacci number φ to calculate the positions of main constructive and constructive-decorative lines in models (see figure 1).



a



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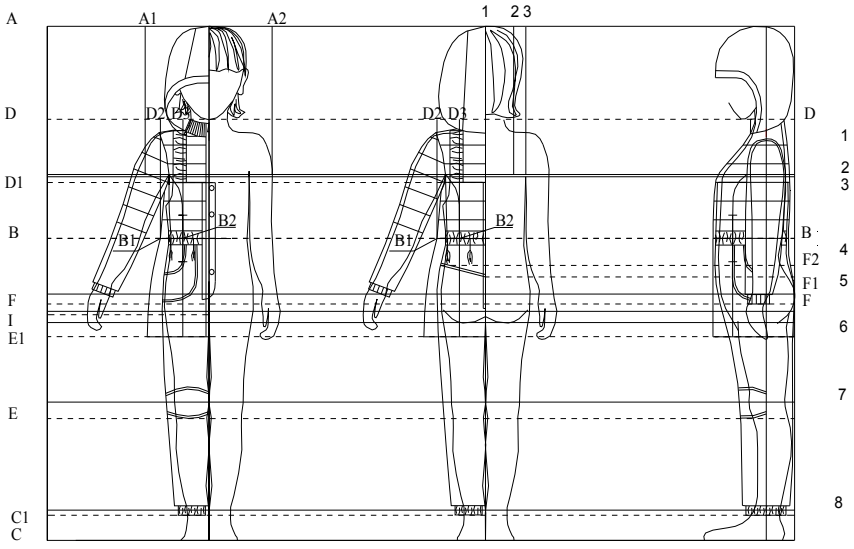

c

Figure 1: External appearance of jackets for girls elaborated using the harmonization laws:
a – model 1; b – model 2; c – model 3.

CONCLUSIONS

In the process of creation in general and in modeling of all types of garments for children the basic law is applied – dependence of shape and silhouette on the age-related particularities of constitution. The most important factor in determining the silhouette, shape and lines of children's garments are the relationships between the length of trunk, arms, legs and natural waistline position. Modern industrial design requires detailed analysis of proportions for age groups, i.e. determination of proportionality criteria for the parts of body and future products. Only the correctly proportioned garments are capable of harmonizing the wearer's external appearance.

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