

# VISIONS FOR FOOTWEAR TIP SHAPE ACCORDING TO THE CONFIGURATION FINGER

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Abstract: Compatibility between the consumer and the interior leg permanent footwear raises a number of issues. And any new form of footwear is time for a new silhouette last. Fashion is a factor in determining the shape of the last significant role. The most important influence on fashion in footwear that has at one time is found in peak shape. During registered a variety of forms leading to the last, for example, pointed, oval, round, square, asymmetrical, curved, trapezoidal, etc. Each has added a tip top recommended. The paper analyzes the morphofunctional characteristic, namely, finger configuration. The configuration of the fingers is determined from the positions of all the fingers of one another, as are six variants. Analysis of the shape and configuration of the arm fingers allow us to make the following recommendations to consumers: people showing finger configuration as in variant V and VI are advised not to wear pointy shoes because of the limited movement of the foot, which favors the diversion finger I exterior and deformed finger V; persons who fall within I-IV variant can procure pointy shoes; a round-tipped shoes, square, curved or asymmetric may be purchased by any consumer regardless of the configuration of the fingers; shoes with cut edge must be present only in garderopa people in variant I and II; consumers whose configuration is like finger-VI and III variants are awkwardly shaped fingers can buy shoes closed in the previous summer, but of different perforations or overlapping strips.

Key words: foot, last, shoe, feature, added, form.

#### 1. INTRODUCTION

Currently shoes is made of different materials, shapes of the sole, heel and tip varied. The main role of footwear is to keep natural aesthetic shape of the foot without causing discomforts, sprains, corns etc. The design and implementation of internal shape of the shoe is necessary that the shape and dimensions correspond to the shape and size of the foot. In this respect it puts emphasis on the rational design of the shoe shape and specifically the plantar surface [1].

We know that comfort is directly influenced by the shape and dimensions interiors shoe / shoe shape, the material properties of the component parts is performed, the peculiarities of manufacturing technology. A comfortable footwear in operation must perform a number of basic requirements such as [2]: the shape and internal dimensions correspond to the foot shape and size of the consumer; reduced mass and stiffness; ensure adherence sole ground that touches on mersstabil; maintain an optimum microclimate in the foot; be safe and harmless; to allow removal of static electricity accumulated on the surface of the foot.

Compatibility between the consumer and the interior leg permanent footwear raises a number of issues. And any new form of footwear is time for a new silhouette lasts. Therefore, the designer must know the anatomy and lasts foot anthropometry, biomechanics understand the laws governing driving leg to evaluate changes in various stress conditions thereof [3].

#### 2. RELATIONSHIP BETWEEN FOOT, FOOTWEAR AND LASTS

The shape of the shoe is directly influenced by the shape of the last used both in the design and the manufacture.



Fig. 1: The relationship between foot – lasts - footwear

The shape and size of the shoe shape are determined from the average foot size representative statistical population level, dimensions determined by anthropometric measurements. Firms producing lasts its follow their own design process, which is reflected in the development of collections according to fashion trends. Building on the tradition and experience, creating a new shoe lasts silhouettes starts from a model already checked functionally. Changes made pertaining to the tip and shank. Typically, the heel remains unchanged to preserve some parts unchanged (for example, backdrop, shank, heel) [3].

Fashion is a factor in determining the shape of the last significant role [2]. The most important influence on fashion in footwear that has at one time is found in peak lasts (fig. 2) [4].



Fig. 2: Shoe shape and appearance of the shoe tip

Over the years a variety of forms attested to top of the shoe lasts (fig. 3), for example, pointed, oval, round, square, asymmetrical, curved [2-4].



Fig. 3: Forms of peak shoe lasts [4]

Each has added a tip top recommended [2]. To the product of footwear to fit the consumer's foot, anthropometric studies are needed. An adaptation as good shoe leg configuration requires its release high pressure points. If the footwear is tightly packed, and the forces exerted by the pressures affecting the skin tissues. And if the shoe is too wide, it may occur dislocations, sprains. In both cases one can speak of discomfort, pain or injury [3]. Businesses shoe lasts of Moldova attorney in Ukraine or Turkey, and the number of dissatisfied consumers increases from year to year.



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The role of anthropometric research is precisely to timely notify dimensional parameter changes in the evolution of the human body to establish a set of representative environmental dimensions [3]. These studies are conducted in Moldova, due to misunderstanding by some people the importance of this research. The Technical University of Moldova, Faculty Textile Industry is made small studies, the results are presented at various conferences.

# 3. ANALYSIS OF DEFICIENCY OF FOOTWEAR

Creating products with a high degree of functionality is a prerequisite for consumer satisfaction with comfortable footwear. A faulty construction of the shoe leads to an incorrect position of the foot, limiting shock-absorbing function, its overload, the disruption of operation and, finally, the emergence of structural abnormalities and / or function of the foot, with repercussions on the state consumer health. And a fashionable shoes, but not conforming to the shape of the foot, as it may cause severe deformities [2].

The main weaknesses of footwear are determined by the construction of shoe shapes annatto inadequate morphological peculiarities of consumer legs, use of materials with poor hygiene or even introduce errors in the design or manufacture of the product technology. For example [2]:

1. The longitudinal axis of the shoe do not coincide with the longitudinal axis of the foot.

- 2. The bottom of the shoe lasts curve does not correspond to the configuration of the foot.
- 3. Footwear with only one width.
- 4. Cutting unsuccessful peak area.

5. Depth of neck too high heeled footwear.

### 4. CASE STUDY

Literature review on morpho-functional feature of the legs of identified 11 characteristics, namely [5, 6]:

1. The general appearance of the foot.

- 2. The shape of the foot.
- 3. Position your finger I.
- 4. Position your fingers.
- 5. Configuration fingers.
- 6. Position the heel.
- 7. Foot vault.
- 8. Position the foot.
- 9. The curvature of the medial heel footprint.
- 10. The curvature of the heel indentation on the side.

11. The mutual position of the joint metatarsophalangeal joint metatorsofalongiene I to V.

Further analyzes morphofunctional characteristic, namely, finger configuration. The configuration of the fingers is determined from the positions of all the fingers of one another, six variants were identified (fig. 4) [6].



Fig. 4: Configuration fingers

A study conducted on a total of 130 subjects from Moldova, female and male, showed that 80% of subjects presenting fingers in variant configuration I, 12% - version II, 2% - version III, 3% - version IV, 2% - V version, and 1% - version VI.

When designing insole is taken into account static and dynamic foot position, and morphofunctional characteristics of the foot [7]. The literature lists several design methods of the insole, ie, schema G, K method, the method AKA-64, Method Research Institute of Leather - Footwear - Bucharest; method of Kiev Research Institute etc. all have a goal to achieve a comfortable footwear [2]. Insole length (Lb) is determined taking into account leg length (Lp), considering the magnitude of posterior curvature of the shoe shape (S) and a decorative addition - constructively with the tip. Addition decorative - construction (Adc) correlates with peak shape imposed fashioned shoe shape, since the tip is sharp, the value addition (R3) should be higher. The point of the tip must be built beyond the stretch of fingers went [2, 8]. When designing insole is necessary to take into account the length of the foot during walking (R1), which under the pressure increases and the people while wearing shoes that have not reached a certain age, foot sizes are increased (R2) in result of increasing individual. R2 value is calculated for six months [8, 9].

$$\mathbf{L}_{\mathbf{b}} = \mathbf{L}_{\mathbf{p}} + \mathbf{A}\mathbf{d}\mathbf{c} - \mathbf{S} \tag{1}$$

where L is the length of the insole; Lp - leg length; Adc - decorative addition - constructive; S - the amplitude of the curvature of the back of the last.

So decorative and constructive addition is calculated as follows (fig. 5 and 6): adult:

$$Adc = R_1 + R_3 \tag{2}$$

for children:

$$Adc = R_1 + R_2 \tag{3}$$

for teens:

$$Adc = R_1 + R_2 + R_3 \tag{4}$$

Value additions for:

- R1 is 5 mm is recommended to open the shoe shapes, summer and loafers and from 10 mm to shoe shapes for other types [1, 2, 8-11].

- R2 is recommended to 1,5-4,5 mm, depending on the age of the consumer. The maximum value is given to children aged 1-2 years, and the minimum age for children from 9-12 years [9, 10].

- R3 is adopted according to the shape of the tip, a rounded tip and square the value of R3 is 0 mm convex; and for a sharp, asymmetric and oval value of R3 is 15-25 mm [8, 9].

$$S = 0.02*L_p + 0.05*h_{toc}$$
(5)

where is  $h_{toc}$  heel height.



Fig. 5: Addition decorative constructive [12, 13]

Adc - decorative addition constructive; Lb - length insole; Lp - leg length; S - amplitude posterior curvature of the shoe lasts; 1 - foot; 2 - last; 3 - contour insole; 4 - foot contour gauge





Figure 6 is analyzed as insole and finger configuration.

Fig. 6: Comparative analysis of arm configuration fingers

a - last tipped square / round; b - last pointy; c - finger configuration

Comparative analysis of figure 6 shows that:

- The lasts with square top, round etc. allow correct positioning of the fingers inside the shoe and allows full use of the natural foot support surface;

- The lasts with a sharp point is fashionable but not always match the shape of the foot, which is why shoes made with this block must be carefully chosen by consumers.

# **5. CONCLUSIONS**

1. Considering the fact that in Moldova there legs anthropometric estimates of population characteristics, morphological and functional features for different age groups, sex, etc., which would serve as a basis for designing and making appropriate shoe shapes is proposed:

- initiate a comprehensive study and awareness of the importance of everyone;

- checking existing data obtained lasts of footwear enterprises in Moldova since the block is imported from foreign countries;

- adapting the shape and size shoe lasts according to the anthropometric characteristics of feet population in Moldova.

2. For a shoe to be comfortable to wear is required:

- consumer education on correct determination of the size of the foot;

- proper design of the insole, and other component parts of footwear;

- avoid shoes, both narrow and wide, because in both cases one can speak of discomfort, pain or injury;

- peak shape right choice considering the configuration of the fingers;

- decorative addition - constructive to draw ultimate elongation after finger while driving insole design.

3. Recommendations to consumers:

- people showing finger configuration as in variant V and VI are advised not to wear pointy shoes because of the limited movement of the foot, favoring the transverse arch flattening previous outward deflection and deformation finger I finger V;

- persons who fall within I-IV variant can procure pointy shoes;

- a round-tipped shoes, trapezoidal, square, curved or asymmetric may be purchased by any consumer regardless of the configuration of the fingers;

- shoes with cut edge must be present only in garderopa people in variant I and II;

- consumers whose configuration is like finger - VI and III variants are awkwardly shaped fingers can buy shoes closed in the previous summer, but of different perforations or overlapping strips;

- a new shoe that gives a feeling of discomfort should not be purchased because it may or may not expand after some time, and while widening "expected" various health problems may occur. A solution would be to purchase footwear enlargement devices.

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