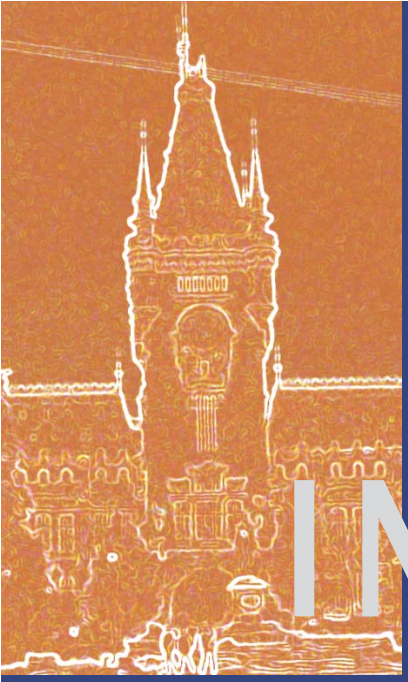

# INTERSECTII
# INTERSECTIONS

ISSN 1582 - 3024

Volume 1, No.5, 2004

design

"Matei - Teiu Botez"
Academic Society
Iasi, Romania

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# Content



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# The stylization of the zoomorphic, anthropomorphic and other vegetal elements

Ilie Krasovski

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SUMMARY:

*"The form is the visible (obvious) figure of the content", writes the painter Ben Shann. Through figure we understand the physical form of an object established by its limits. Every time we perceive a figure, we interpret it, consciously or unconsciously, as representing something and so, as being the form of the content.*

*In this way the artist, the designer can exercise his liberty through the interpretation level, the abstract that resort to the subject restoration. He can copy the image of the material world, with its fidelity and meticulously or can use total no mimetic figures that reflect the human experience through visual expressions and pure space relations.*

*The stylization is the simplification, the graphic ordination of a natural element, through: making evident the main elements (essential) and blurring or giving up to the secondary, unessential ones, keeping the natural proportions. The stylization:*

*- the visual organization, after a particular graphic code (graphic personality)*

*- the visual organization of the essential elements, characteristics in a particular way, original, keeping a maximum legibly and clarity of the form.*

Key words: stylization, abstracting, and interpretation

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I. Krasovski

## 1. MEANS AND MODALITIES OF REALIZATION

Means: line, point, and surface.

**Figure 1.** Symbol realized through the utilization of the line with equal thickness. The sketch is stern, geometrical.

**Figure 2.** Symbol realized through the utilization of the modulated line. The sketch is free.

**Figure 3.** Symbol realized through the surface utilization. The distinct elements of the model are separated by a free space, a line with equal thickness that gives unity to the ensemble.

**Figure 4.** Symbol realized through the simultaneous utilization of the surface and of the line with equal thickness. The sketch is stern, geometrical.

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**Figure 5.** Symbol realized through the simultaneous utilization of the surface and of the point. The sketch is stern, geometrical; the points have a circular shape and an equal dimension disposed after a grill.

**Figure 6.** Symbol realized through simultaneous utilization of the surface and of the point with a triangular shape. The points are disposed after a grill.

Means to realize the stylization:

- the reduction of the volume from 3D to 2D

- the visual ordination of the elements, through: symmetry, parallelism, repetition

- the geometrization of the characteristic elements

- the choice of the best sight (visual) angle to realise a more suggestive image – example: 2D, from face or profile

- the solarization – representation of a natural element through the light and shadow contrasting (the brightest tones become white, and the darkest ones become black).

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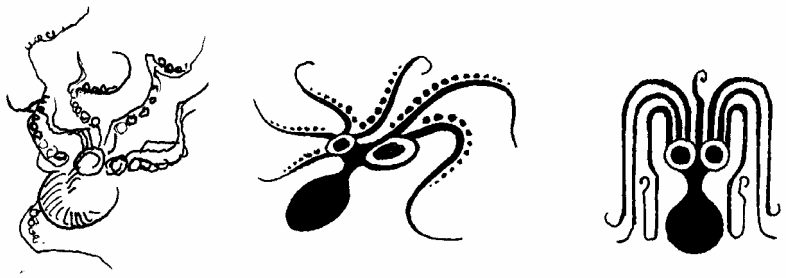
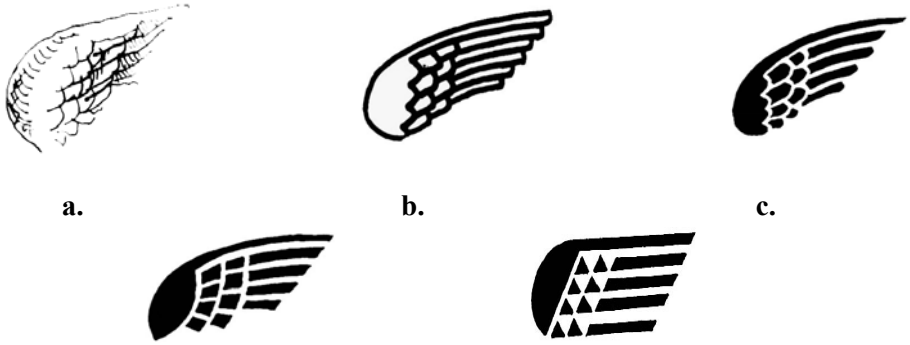


**a.** **b.** **c.**

**Figure 7**. The stylization phases – octopus
a. Sketch realized in Indian ink, pen after the natural model.
b. The improvement stage. The distinct component elements of the model begin to be graphic codified. The tentacles become modulated lines; the body is suggested by a clear oval, the cups are pointed by the circular shape disposed in connection with the lines of the tentacles.
c. Advanced phase of stylization. The existent uncertainty from figure 7b is over fulfilled through the visual order of the constituent elements of the model. And so appears the symmetry, the connected straight line with circle spheres and disappears the details (the cups).



**a.** **b.** **c.**

**d.** **e.**

**Figure 8**. The stylization phases, the bird wing
a. Sketch realized in Indian ink with pen after the natural model.
b. Symbol realized through the utilization of the line with equal thickness.
c. Symbol realized through the utilization of the surfaces. The white space among the specific elements is a white line (negative) with a equal thickness.
d. Symbol with an advanced level of interpretation. The plumage is realized through points with a square shape, lines with equal thickness and surfaces. The sketch is geometric.
e. Symbol with an advanced level of interpretation. The plumage is realized through triangular points, lines with equal thickness and surface. The sketch is sternly geometrized.

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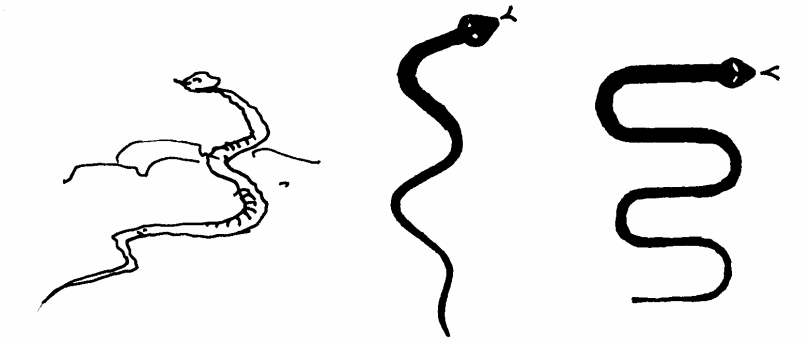
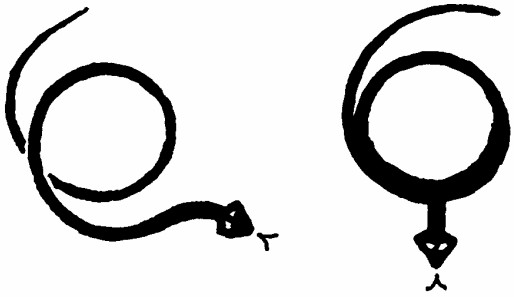


a. b. c.

**Figure 9.** The stylization phases – snake
a. Sketch realized in Indian ink, pen after the natural model.
b. Symbol realized through the utilization of the modulated line with free route.
c. Symbol realized through the utilization of the modulated line with a stern, geometrized route, a straight line connected with circle spheres.



a. b.

Figure 10. The stylization phases – snake
a. Symbol realized through the utilization of the modulated line with the tendency to realize a circle.
b. Symbol realized through the utilization of the modulated line. The uncertainty from figure 10a is over fulfilled through the presence of the circle.

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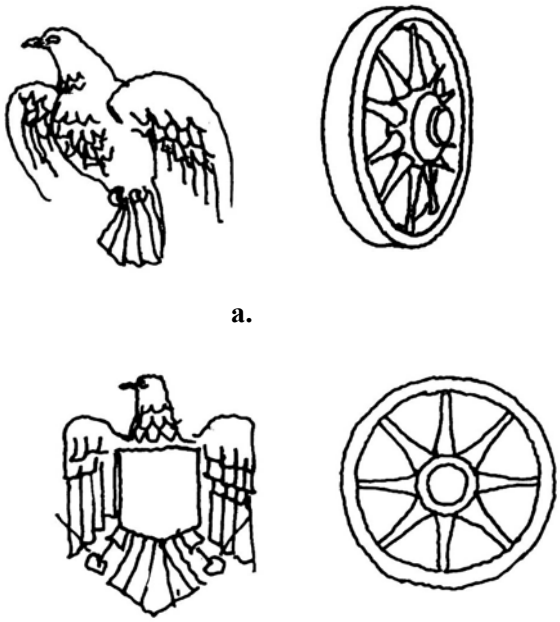

**a.**

**b.**

**Figure 11.** Examples for the elaboration of the symbols through the utilization of the frontal sight angle and the symmetry.
a. Sketch realized from a certain sight angle (…)
b. Sketch frontal realized

The classification of the stylizations:

a) after the abstracting and interpretation level of the natural model: small level and high level:

**a.** Small level of stylization

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**b.** **c.** **d.**

High level of stylization

**Figure 12.** The illustration of the stylization levels – the horse
a. Symbol realized with the help of a sketch very close to the natural model.
b.c.d. Symbols realized with the help of some sketches that keep only the essential elements of the natural model in a graphic vision, strongly individualized.

Small level of abstracting means an original graphic intervention on the natural model, but which does not estrange too much from the natural aspect of the form.

The natural model is immediately recognized.

This thing can be illustrated with examples, with the first representations of the symbol of the Shell Company.

High level of abstracting and interpretation means an original graphic intervention on natural model, which characterizes more through the plastic imprint (fingerprint) of the artist (designer) than through the similarity (likening) with the model. Though, a good symbol needs to be quickly (easily) identified, even in this case, with the natural model, otherwise we will face with a form without content (subject).

We can illustrate this situation using also the "SHELL" firm's symbol, but with the present one that expresses very clearly a very original way of graphic interpretation of a natural model.

b) After the type of the used graphic code:
   – geometrical rigid (ruler, divider)
   – free drawing, standardized or vectorized
   – gesturalism

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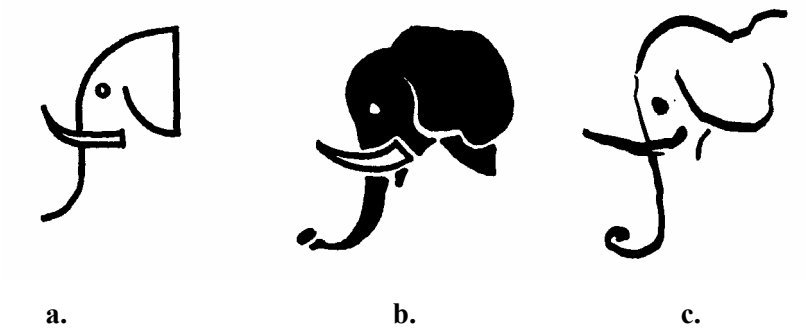

a. b. c.

**Figure 13.** The illustration of the use of some types of graphic codes different for the realization of the symbols – elephant head.
a. Symbol realized with the help of the equal line, with a stern, geometrical route (straight line and circle sphere connection).
b. Symbol realized with the help of the free sketch from a lateral sight angle. The exterior contour is loaded with Indian ink, becoming a spot.
c. Symbol realized with the help of a fountain pen from wood with the truncated top softened in Indian ink, that determines the modulation of the line's thickness. The line's route is free and the symbol stakes on emphasizing the gesture.

**Geometrical – rigid**.

Here are those improved images, realized in an obvious way with the help of the tools used in the technical drawing (ruler, divider) and are the results of the connections of the circle sphere, of the right angles, of the parallelism etc.

At these images we can easily distinguish the technical drawing after they have been realized (E.G.: the connection centers etc.)

**Free, standardized, vectorized drawing**.

Here are those improved images that are the result of the author plastic sensibility. At these hand drawings the outlines are improved – standardized (checked) with the help of the square net-shaped or, recently, with the help of the computer by the vectorized with the Bezier curves.

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**Gesturalism**.

Here are those improved images realized with the help of some tools and special material properties, which emphasizes (and stakes on) the spontaneous gesture of the author (designer). (E.g.: the Japanese calligraphy). We can talk about the using of the brush, the Indian ink, wooden fountain pens with different points soaked in Indian ink, as well as by using some special supports such as the paper, with different textures, porosities.

CONCLUSIONS:

To emphasis the essential role of the interpretation in the realisation of the graphic symbols (improvements) we can quote Leonardo da Vinci. Although in the quotations he refers, in a limited way, to the painting, we keep in mind the plastically creation.

"The painter that restores only what his eye reflects and judges, without reason, is like the mirror in which the opposite things imitate without knowing their essence"[1]. For: "The painting is the biggest work of mind (discurso mentale) and artifice, that force the painter's spirit to transpose himself in the spirit of nature and became an interpret between this nature and art, studying together with her the reasons why objects appear and after what laws"[2].

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# The Kitsch and the cultural mass

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Summary

*Universal, usual, important concept, it first refers to its esthetics genesis period, to a style – of a missing style, to a function – that one of the comfort, later added to the traditional functions. Kitsch is a very known word in the German language spoken in the south; with its modern meaning, it appears in München in 1860. It means "to do something superficially". Verkitschen means "to degrade, to maim, to stack", so to sell someone something else than he asked for. It is so about the genuine negation. Kitsch also means "fusereala" (according with Duden) and represents an esthetic result of the selling process of all the products to a society in shosp [1].*

KEY WORDS: design, verkitschen, kitsch, gadget, souvenir, Bon Marché

## 1.WHAT IS THE KITSCH

Broch says that "A bit of kitsch exists in any kind of art". Non-genuine is bound of the genuine, and in every art exists a doze of conventionalism, of desire to do as every client, that an artist has, wants to.

From psychological point of view, the kitsch appears as a sun of the global alterations of the behavior attitudes [2]. We may say that it is an alienation symbol. The kitsch alienation process results from a kind of relation of the individual with the environment, like in the case of the handcraft sliding in the bricolaj (*do it yourself)*. So, the appearance of the *kitsch's lives* is favored by the object and micro event agglomerations from the daily life and it is accepted by the snobbism. Gradually (step by step) it will embrace all the quotidian society, finding support in the frivolity of the 1900 period. The alienation seems to be the biggest danger that watches us, through the infiltration of the kitsch both in humans and things. In the esthetic literature written after 1900, this term has always been seen under the negative aspect and only beginning with pop period the kitsch alienation has been putted between brackets. It became an esthetic amusement being considerate funny. It is a first reconsideration, a bow of courtesy type in the front of the consumer - the king. Thus, the kitsch has simultaneous connections with the functionality, the acquisition (the desire of the accumulation) and with the esthetics. When an



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alteration in the functionality side appears and when a specific tendency toward decoration appears, this addition is felt like a necessity for "beautiful". The consumption of the kitsch may be compared with that of the drugs. It is a weakness almost general – human. It is the expression and the satisfaction of the aesthetic taste always perverted. After a longer consumption, any form of the drug, and of the kitsch also, transforms into a necessity of witch the man cannot easily escape.

## 2. WHY DID THE KITSCH APPEAR IN OUR LIVES

To be able to comment upon the appearance if this phenomenon in the people lives, we must explain a summary typology of the relations that a man has with a certain type of environment. It is about a reserve in accordance with the man chooses or decides on the environment. Abraham Moles, in the *"Kitsch psychology"* established a range of human reports with the environment, made up of an ensemble of things or objects:

*The austere mode* – the man that isolates from the world, like the introvert or the monk, also isolates from the objects. He kills the acquisition instinct, as well as the emotional or social function of the objects.

*The hedonist mode* – things are made by man, and they represent one of his environment sectors (domains). There is a sensuality bound to the objects, a joy produced by the things. This affection for the object is temporary but intense.

*The aggressive mode* – the aggressiveness would be the third type of relation with the things. Their destruction is, in a way, pleasant, because it means to posses them. To destroy it is as fascinating as to construct. In a society that passes from a lack state to an abundance state, the destruction does not stimulate the regret, but the reserve.

*The acquisitiveness mode* – in opposition with what we said until now, the monopolizer mode is clear marked by a possessive bourgeois civilization, which saw in ownership the expression of the coextensive human being dilatation on his acquisitions. In the today Romanian society are many examples. We have many *Kane Citizens* with which we can "praise", which have converted their power in the accumulation of the objects: the world seen as a fair and, implicitly, the world possession!

*The surrealist mode* – it is a recent discovery (1920 – 1930). It bases on the bizarre factor. In fact, it is about the association of some objects from their usual frame with 3 or *n* dimensions. So, the gathered elements, interest less as objects or as fragments, and more as functions, sterilized by their juxtaposition.

*The functional or cybernetic mode* – this relation relays upon a state of reason of things, where each thing is the tool of an act. If the action does not exist anymore,

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than the object becomes useless and so disappears. The aesthetic appears as a supplementary value, resulted from a proper performance.

*The kitsch mode* – the original composition of attitudes that we have just described. It bases on the idea of the anti-art of the happiness, on a "middle" situation. The desire of the owner to accumulate is justified by the pretext of the functional. It is the case of the American gadgets or of the French souvenir. The kitsch has simultaneous connections with the functionality, acquisition and esthetics.

In his book, *The kitsch universe – an esthetics problem*, Gavril Máté speaks, at a given moment, about the social implications of the kitsch appearance. The modernization, the industrialization, the migration from the rural zones to urban zones and reversed, has led to the isolation of the human beings. Or the loneliness represents one of the main factors that generate the kitsch. The guy that is deprived of his personality retires in his shell and so thinks that he can handles everything. The bourgeois world seems to him a world full of unlimited possibilities. In one hand, it is about the irreversible process of the life prozaizare and on the other hand, interferes the aspiration that is illusory manipulated toward a life without worries and sunny. An eloquent example in the Romanian society, it is represented by the south-American soap operas or the American soap operas. They are real drugs, especially for consumers from the rural medium. Everything can be resolved at the mediocrity level, which puts on the appearance of the high quality; starting with the simple material objects and finishing with the great productions of some famous movie houses. *The hidden, lacquered mediocrity constitutes the common denominator of all forms and variants of the kitsch.* When such a product is required by the mass then the universe of the kitsch constitutes.

## 3. HISTORICAL FRAMES

The kitsch is a phenomenon that exists in all times and in all arts but the privileged domain is the society of the consumption. It associates with the idea of the alloy regarding the values of the objects. It throws more than it collects. As a geographical zone, the appearance of this phenomenon corresponds to South Germany, Bavaria and Central Europe; than to the France of 1900s and to the United States in the period of the enriched people from Chicago. In fact, München is the capital of the kitsch, having as secondary centers the Paris, the Düsseldorf, the Bruxells and the Chicago in the 1860 – 19710 period. The kitsch inspires and feeds itself from all artistic schools from this period: Modern-Style, Jugendstil, from the Gaudi and Horta works. And though, there are trends that have been repudiated. It is about the impressionism, expressionism and, especially, the functionalism.

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As we have said, the unquestionable capital of the kitsch is München. Here, in a bourgeois atmosphere reined the king Ludovic the Second Wittelsbach, known in our days as the king of the kitsch. He was a king of miracles and of the fantastic, whose operas pulled out the tourist's admiration, enriching the state treasury. Everything that he realized is translated now as sold souvenirs near famous places. All these exert a strong social influence from quantitative point of view.

Going further, to the France of the 1900s, is enough to illustrate the Zola's novel, *Bonheurs des Dames*: the sell system with a fixed price and with great benefits. Aristide Boucicaut, is the creator, in 1852, of the "Bon Marche" system. The shop tends to become, slowly, the temple of the commerce. The client does not feel dominated as one does when enters in a small shop, where you are at the seller's moods. On the contrary, he believes that he is the dominator, always welcomed by the advertisings. There is, in this system, the irresistible desire to enter in a shop not from the necessity to buy something but form a generous desire to see, to touch, to visually weigh … Round 1950, the universal shop saw itself competing with the "little prices shop" and with the supermarket.

Another historical frame worthy to be considered, is represented by the appearance of the skyscrapers in the Manhattan granite and considered in Europe as a symbol of the modernism. In 1969, John F. Corkhill was building what is called *Addition to the Washington's monument*. It is an amalgam of styles that has a strange finish. Among other elements, we discover in the construction a roman aqueduct and the Tower from Pisa, but straightened. In the middle of a dominating civilisation, the kitsch thinking becomes mistress in the architecture, because a series of functional elements are embezzled from their initial sense, to become decorative elements, without any functional meaning. It is the case of the Las Vegas town, the paradise of the rich people, where we meet the Egyptian Sphinx next to the Eiffel Tower and the pyramids from Mexico. Otherwise, not long ago, an Eiffel Tower appeared in Slobozia, right inside the famous pseudo ranch "Dallas" …

## 4. THE MAN AND THE KITSCH FAMILY

Gavril Máté says that the kitsch man is the most cautious man from the world. It is about a calculated caution, very carefully tested and checked. It does not oppose any kind of resistance toward the negative influences of the nature, because it does not have some capable forces for their rejection. On the other hand, a genuine personality opposes to some influences that are contrary to its defining essence. Another personal name for the kitsch man is – after a metaphor of Hermann says – "the rubber man". His main character keeps him from the society, existence and daily destiny kicks. As we already have said, the guy prefers to isolate in the world of his family, to make his daily balance sheet and falls asleep reconciled with him.

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The incapacity in the case of the little bourgeois goes to resignation, passivity and to the necessity of an evasion. Also Hermann says that to the kitsch man does not like that someone undermines his opinions. On the contrary, he likes them to be strengthened. Also, he is characterized by sentimentalism and nostalgia, especially in the daily life and cultural frame of the town mass of rural source. Because the kitsch man presents a comfort and an intellectual insufficiency, the understanding of the apparently world and the orientation in its frame does not suppose a special psychic effort.

Because the human existence is indissoluble attached by objects, one of the typical frames where the ensembles of the kitsch objects form is the family heart. The presence of some elements having a typical little bourgeois mentality, are obvious in the general behaviour plane, of the securing and of the display of some material values. There would be a lot to tell about the rugs with the Kidnapping from seraglio, about "sweet" or "funny" objects from shelves, and also about the beautiful paintings with Sunsets or the faience covered by flowers form the bathroom. For the today peasant, the process of finding and buying of modern furniture, of some technical products, represents one of the synchronization forms with the living level of the city life. Even the old icons from glass are changed with some more colourful and more beautiful, lacquered till the end, looking as a glaze from a confectionery.

## 5. THE KITSCH IN THE ART

To continue the ideas from previous chapter, especially the plastic arts as the domain of representation, even though one may say very much about the kitsch literature, music or drama. The manifestation forms are so specified that one may write full novels. "Artists" exult with enthusiasm; they are very prolific, working sometimes more paintings at once. Patterns are used many times too. I met professional artists, which from commercial reasons were forced to prostitute in this way. The problem is other. They hardly succeeded to put themselves in the position to produce something like this, but even hardly they could come back to their normal professional condition. Otherwise, there was during the time a professional kitsch: baroque, academic, naturalist and even abstract. Authors have no kind of hesitation to express many themes, using in a distorting way different kinds of consecrated artistic modalities. Colours are or licked or glossy, or dense touches with colours that imitates the offhandedness of the great masters. It is used even the palette knife, sometimes you meet all techniques in one place. What is important is the effect. The supreme goal is that the painting to be with effect. And this must give an impression of luxury to the room where the painting is. The oriental themes are most tasted, being favourite images with palm trees and scenes from the gypsy's lives. Most of the time, these pseudo-artists start from famous

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paintings, parodying unconsciously, leading the true art to a rudimentary level of perception.

As long as the kitsch exists, the work of the real artist, his talent and the years of study, his culture, are degraded, decreasing the painting to a sub cultural level and compromising the true artistic nobility.

*There is though a segment in the painting that is often confounded with the kitsch: the innocent (naïve) art. Innocent painters detach from the bad taste because of their native talent, their capacity to learn after nature, but, especially, through their sincere vision. They are characterized by the lack of the uniformity in their creations, oscillating between the kitsch and the art of quality. Henri Rousseau, called The Custom House Officer (1844 – 1910), was a self-taught painter. But through its hard work he reached a high plastic refinement. His world is fairy, ingenue, not corrupted by the false virtuosities, as the kitsch world is. At one moment, at a old age it was mixed up, because of its naivety, in a judicial business with false checks. The lawyer that has sustained its innocence presented to the jury his paintings as an incontestable proof of this man purity and candour.*

## 6. CONCLUSIONS

The kitsch is perceived from the beginning as a psycho-pathological aspect of the daily life. The quantity of the kitsch in society cannot increase and the individual fight – artist, intellectual, man with good taste – against this phenomenon is always with a local character, a particular deviation, that results in an increasing somewhere else. Like a malignant tumour.

It is kind and insinuating, standing and ubiquitous, integrated in our lives and it does not require even one effort in its accept. Because it is a daily phenomenon, every artist, hero or ascetic has inside of him some kitsch. The relations among people transfer at the level among objects, all conflicts handling in the same way and so human and things ecology sets up. And from artistic point of view, the kitsch and artistic movements are leaving in a symbiosis; the art supplies the spring form where the universal kitsch will also supply, and by this condemning itself to the destruction of its transcendental character, so of its essence. The artistic cycle imposes as one if the fundamental device of the contemporary society.

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# Experimental researches concerning the rolling of silver (ag999,96) and of the silver alloy (agcu800)

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Summary

*One of the most beautiful branches concerning the projection activity of a designer is the manufacturing of precious metals domain. From the precious metals category, the silver was chosen to be studied, because this metal is more accessible from the cost price point of view, and also because of its many ways of utilisations (there is no other domain in which this metal is not present). The accessory industry, specially the sector that serves the fashion world (buttons, buckles, decorative shackles (chains), jewels, it is in a permanent development, the silver is becoming more and more for this domain, an "industrial" metal because of its massive utilization. The cognition from the technological behaviour of this metal, represents a necessity in the designer activity, this designing technological forms, possible ones, answering both the market needs (requirements) and the production possibilities.*

*For the manufacturing of the silver objects are used, specially, semi-manufactured rolling band type or wire. The semi-manufactured of the wire type can be rolled and transformed in flat bar, for a later manufacturing, according with the shape conceived by the designer. This work recommends the establishment of some parameters needed to obtain the flat band through the rolling of the silver wire.*

KEY WORDS: design, silver, micro rolling, technical parameters

## 1. THE PURPOSE AND THE IMPORTANCE OF THE RESEARCHES

The metal manufacturing in Romania dates since the neolithic period (5500 – 2500..Chr). Through its special qualities concerning the aesthetic, ornamental aspects, resists at the chemical agents and also through its possibilities that offers through processing in a diverse range of shapes, sizes and aesthetic effects, silver remains one of the used metals in the multiple domain.

**The silver** is a metal that belongs to be precious metal category (noble), the native metal group. Its name comes from the Latin word **argentum** = a light colour, white [8, 9, 14, 26, 31].

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*Experimental researches concerning the rolling of Silver (Ag999.96) and of Silver alloy (AgCu800)*

**The precious metal** (noble metal) are those metals that present a high rate (degree) of malleability and are very resistant to the chemical agents, specially to the acids. These metals:

- they oxidize hard, and their ions have a great inclination to pass into a metal state.
- can be find in metal state in the nature
- they have high melting points
- are ductile (plastic)
- they have a nice aspect because of the shiny metallic polish (gloss) that is kept in the atmospheric conditions and in contact with the most active chemical substances (excepting the royal water).

The precious metals can be found rarely in the nature and are usually used for the manufacturing of the jewels (as ornament objects), as currency standard, and in the manufacturing of some pieces and instruments in the electrical engineering industry, in the fine mechanics etc. From the precious metals category there are: the gold, the silver and the platinum metals (ruthenium, radium, palladium, osmium, iridium, platinum).

The attribute of precious belongs to these metals as a nobility title, for their economical value importance and also for the role that played and still plays in the man's life.

Even though the silver has a large utilisation and its manufacturing dates since the oldest times, "the caste secret" made to be less studied from its technological behaviour point of view and the information that exists cannot be transmissible.

The study of this metal was made in comparison (as against) with aluminium and copper, metals witch presents a near technological behaviour (states the speciality literature), these metals belonging from the same group of metals, being used in the toolmaker adjustment, the checking of the technology or the tracing of the unfolded product that is supposed to be manufactured.

Studying the literature of speciality, different products and objects from silver, as well as different departments of a jeweller, it came to the conclusion that the main types of the used processing are: the pouring and the manufacturing through cold plastically deformation. There are preferred the following ways of manufacturing through cold plastically deformation: the rolling, the drawing, the upsetting, the forming (the shaping), because the precious metal wastages are minimal and the processing, considering that the silver is a very malleable and ductile material, is realised with small deformation forces. [19] Considering the legally processing of

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this metal and for the safety of the value title, the silver and the silver alloy used in this processing, have been obtained from the State Monetary.

The obtained date by studying the behaviour of the silver allows:

- the realization of the pieces through plastically deformation at cold with a minimal consumption of energy and precious material, in good aesthetical conditions (without any processing defects that can affect the visible part of the piece);
- the realization of the pieces with thin walls, of small dimensions, with complex shapes, with a reduced consumption of material, with a good precision;
- the obtained pieces from silver (characterized by a small hardness) to be resistant, to not need a high capacity of manual labour, to need a few number of thermal treatments of returns;
- the establishment of the needed deformation forces values;
- the conceiving of the toolmakers and simple devices that allows both the processing of good precision and the realisation of the series products;
- the establishment of the specific technological ways, considering the necessity of the application of the thermal recrystallization treatments for the restoration of the workability of the material properties, which, eventually, have been hardened during the manufacturing process [13].

## 2. A BRIEF HISTORY

The jewels an the accessories are ornaments form precious metals, decorated sometimes with precious stones, worn from the ancient times, by persons belonging to all the cultures, civilizations, religions, as a supplement of the personality, as a social or official symbol, as a religious, social or political emblem. These objects have been and are executed form other materials also, organic or inorganic (hair, pits, plants, shells, wood, plumes, skin, flakes, crusts, bones, ceramics, metals, minerals). The jewels express those objects of ornament made form precious metal with or without precious stones.

The jewels are worn on: the head (crowns, tiaras), arms, neck, legs, bust, tongue, ears, nose etc. they can be worn directly like we just said or can be worn as accessories: buckles, buttons, needles for neckties, hats, badges, fasteners, dresses, belts, small recipients (elegant, nice decorated for perfumes or liquors), etc.

The archaeological researches brought out objects which were made in ancient times that proves that the manufacturing profession if the jewels dates from the

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most ancient times, reaching very precious artistic values. The oldest ornament and luxury objects discovered are over 10 millenniums old (the cult objects discovered in the temples from Ceatal Huiyk, Anatolia) or 6 millenniums old (from the sumerian old cities or form Susa from the prehistoric Elam). The processing techniques of the ornament or cult objects from those periods (from Mesopotamia, Egypt, Levant, Troia, Creta Minoica, Antiq Grece, Micenia) are used: the filigree, granulation, cloisonné, enamelling, that allow the realization of the wonderful artistic compositions with a scenery character, from the animal kingdom, scenes from religion or life.

## 3. THE PHYSICAL – MECHANICAL PROPERTIES OF THE SILVER AND ITS ALLOYS

The most important physical – mechanical properties of this metal are: [2,.3, 4, 5, 8, 9, 10, 11, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 31, 32, 33, 34, 35, 36]: the silver is the whitest metal; its trace can be white – silvery, yellowish, grey; in contact with the air it is covered by a film (scab) of a dark colour; when it is polished, has beautiful glint because of its great power to reflect the rays of light; even though it is opaque, in the reflected light it appears white – silvery; its capacity of reflection in the air for green colour is 95,5% and for red is 93%; the refraction index is 0,181; it is isotope; the silver hardness is 2,5 (on the Mohs scale); the specific weight is 10,4293 g/cm3; the melting point is 960,5°C; the boiling point is 2170°C; the vaporisation temperature is 2212°C; it can be rolled in foils with a 3µm thickness, the silver allowing to pass (at this thickness) o bluish light; it is very plastic $A_5$ = 48 – 50%; is soft (softer than the copper and harder than the gold), malleable, ductile (from one gram of silver it can be pulled one thread of 1800 – 2600 mm length) and stainless; the silver tenacity is quite reduced (one thread of 1mm$^2$ in section it brakes under a load of 16,5 Kg); the tenacity of the silver is between the tenacity of the copper and the tenacity of the palladium; the breakage load is 28,5 kg at a 0°C temperature; it doesn't combine with the oxygen, but it dissolves in melted state, a big quantity of oxygen (until 22 times of its capacity), that is eliminated with violence at the solidification, throwing metallic drops, and that's why the pure silver can not be poured; presents the biggest electrical and thermal conductibility among the elements; the crystallization system is cubic; Seldom, it is presented under the shape crystals, frequent under the shape of twisted threads, dendrite, irregular plates, sometimes curved, nuggets, compact mass, thin papers etc.; crystals, when exists, have the shape of dodecahedron; the linear dilatation coefficient is 1,92 x $10^{-5}$ at the temperature of 40°C; it is diamagnetic; almost all the combinations of this metal are not toxic.

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The fine silver (according with STAS 3321 – 88) has the mark Ag999,6 with a 99,96% content. The examination of the chemical composition it is made according with STAS 8907/2 – 71.

## 4. THE PRESENTATION OF THE ATTEMPTING METHOD AT ROLLING

The rolling process is a deformation process of the precious metals semi-products, in the shape of ingots, wires, flower band etc. through there passing between two or more cylinders [1, 4, 6, 7, 17, 21, 27, 29, 30, 31, 37, 38, 39]. The rolling process is realized through plastic deformation at cold of the wire resulted through drawing, with a view to obtain a band of rectangular section.

The main parameters in the realisation of these processing operations are:

- The tolerance at the thickness of the laminated band must be as less as possible;
- The dimensional uniformity for all band length.

For the obtaining through rolling process of a certain thickness of a rectangular section band of wire, the wire diameter is reduced through successive crossing among the rolling mill cylinders. The reducing coefficient for the first operations is, in general, from 19 – 26% and for the last operations is comprised from 10 – 20%. The rolling speed has values of approximate 18m/min. at the first operations and can reach 24 – 26m/min at the last operations. Between the diameter of the drawn wire constrained to the rolling operation and the band section obtained through the rolling process there is an interdependence.

The adjustment at the rolling rate can be done with the help of the control micrometers or with the help of some holds (slips) of precision or spies.

## 5. THE DESCRIPTION OF THE STAND USED AT THE ATTEMPTING OF THE ROLLING PROCESS

The stand for the effectuation of the determinations at the micro-rolling is presented in fig. 1.a.b and fig. 2. This stand (fig. 1.a.b.) is composed of a micro-rolling mill (2) electrically turned over, the distance among the rolling mill cylinders can be adjusted with the help of two micrometers (1). The cylinders are electrical turned over through the cog wheels gearing 4, to assure a uniform speed. The measurement method of the required forces values at the rolling process is the tensiometer method. The deformations that appear during the processing of the semi-products are collected and transmitted by two dynamometers (elastic

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elements) (3). The signals are processed and registered at the inscriber (5). The obtained data at the inscriber are mathematically processed depending on the adjustment characteristics of the tensiometer deck (6), of the inscriber and the curve obtained at the standardization (calibration) of this stand (fig.3).

The obtained curve at the standardization of the stand establishes the mathematical dependence between the movements registered at the inscriber and the known forces applied to this one.

This stand allows, simultaneously with the processing of the semi-products through rolling process, the obtaining of a large range of typo dimensions of the material, the measurement of some rolling characteristic parameters (deformation forces, deformation grades), as well as the establishment of some interdependencies among the rolling parameters.

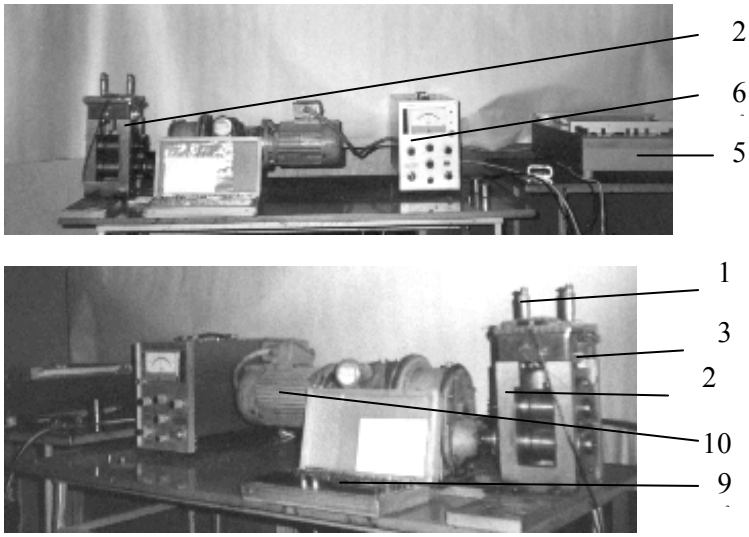


*Fig.1.a,b.* The stand for the effectuation of the determinations at the micro-rolling; 1.Micrometers (the adjustment of the distance among the rolling mill cylinders); 2.Rrolling frame; 3.The elastic element (2 pieces); 5.Inscriber; 6.The tensiometer deck; 9.Parallel plan holds and spies for the controlling of the distance among the rolling mill cylinders; 10.Engine electrical turned over by rolling grill.

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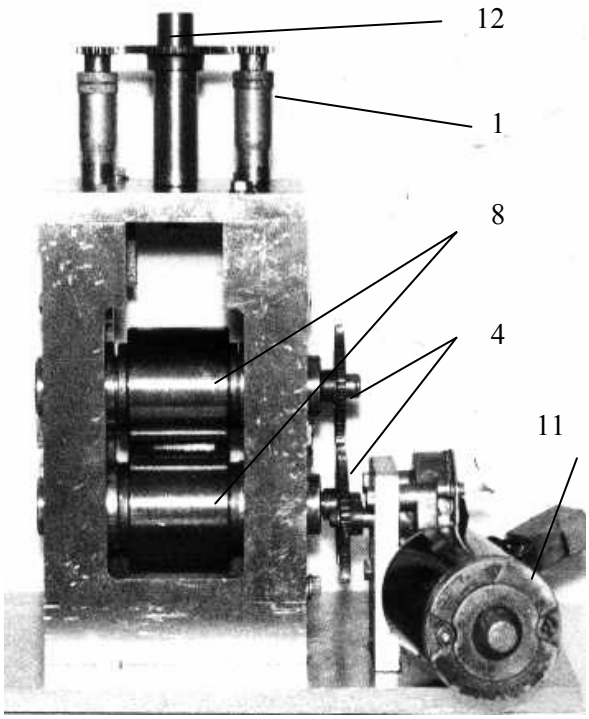


*Fig.2.* Rolling grill. 1. Adjustment micrometers for the distance among rolls; 4. Gearing for the movement transmission; 8 Rolls; 11.Engine; 12.Device for the adjustment of the distance among rolls.

## 6. EXPERIMENTAL DATA

The rolling operation is realized through plastic deformation of the wire, from the following materials: silver (Ag999,6), silver alloy (AgCu800), aluminium (Al199,7) and copper (Cu99,9). The purpose of this processing is to obtain a rectangular section band and, concomitantly, to establish the values of rolling specific parameters: the rolling forces; the deformation grades; deformation pressures; defects. [23] The obtained data at the standardization are presented in the graph nr.3. Analysing the specific graph of the stand standardization at the rolling we can figure that the dependence between the force and the movement to the inscriber is linear, and through a mathematical shaping, this one is expressed by a line that has the following equation:

$$Y = 1{,}7076X - 0{,}8707; \qquad R^2 = 0{,}9997 \tag{1}$$

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Through these determinations, it has been tried, simultaneously with the rolling process the establishment of the dimensional values of the forces required for rolling process, of the rolling pressure and the establishment of some relations between these measures and reduction coefficients of the used sections, as well as the realization of a technological way of the rolling process in which, using a specific coefficient to reduce the material section, to make possible the rolling without using thermal treatments for roasting among the intermediary operations. So, the variations of the decrease of the section coefficient ($\delta$), is constant, in general ($\delta \cong 20$). To remember that this coefficient of the section reduction is different from the real one (obtain at the rolling process), because of the elastic properties of that analysed metals.

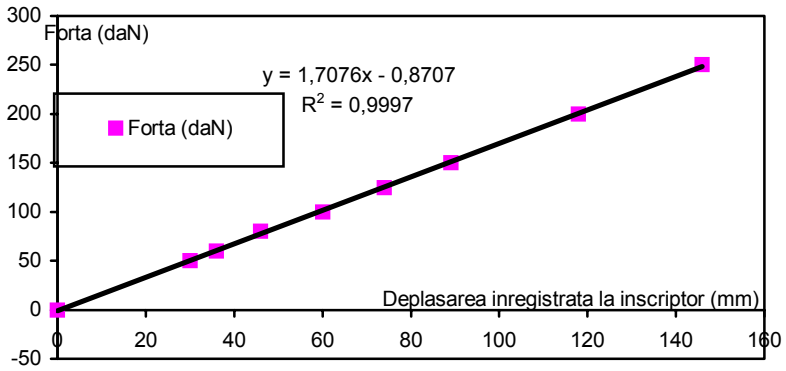


Fig.3. Stand standardization (calibration) form tolling process and the establishment of the dependence between the force and the movement registered at the inscriber

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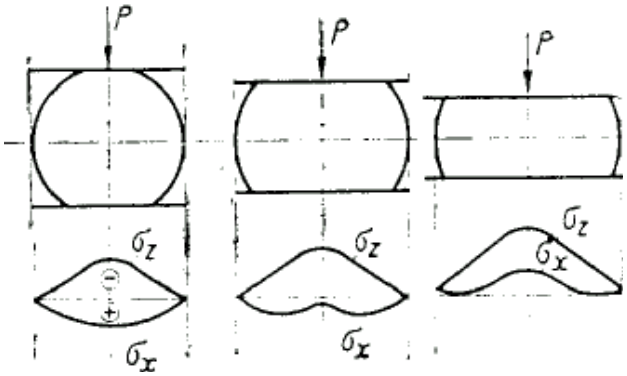


Fig.4. Efforts distribution scheme at the wire rolling [7]

The adjustment at the quota of the rolling mill cage (fig.1; fig.2) will be done with the help of the devices from the endowment and with the spies help, through the cogwheel device. Take care not to repeat a crossing, because this one can affect in a negative way the material deformation capacity. The semi-product state (of the wire before the rolling process) has a very important influence on the band's characteristics obtained through rolling process. It is imposed a checking of the drawn wire quality that must be rolled considering: dimensional deviations of the drawn wire diameter (no more than ±0,01 mm), the tensile strength and that of the extension, the drawn wire quality, the lack of the deficiencies, the pores flattening; the state of the cylinders surfaces of the rolling mill. The end of the wire, that follows to be rolled and that has to be inserted among the cylinders of the rolling mill, will be initially flattened and so ca be warmed up easily.

*6.1. The rolling pressure*

The speciality literature presents the entire pressure on the rolling cylinders $\mathbf{p_t}$ (fig. 4; fig.5) as being equal with product among the horizontal line projection of the contact surface between the semi-product and the $\mathbf{S_c}$ cylinders and the medium tolling pressure $\mathbf{p_m}$ [1, 6, 7, 39]:

$$P_t=S_c p_m \tag{2}$$

In which $S_c$ represents the contact surface between the cylinders and the semi-product and it is calculated with the help of the formula (fig. 5)

$$S_c=[(b+B)/2]\cdot l_c \tag{3}$$

and $p_m$ represents the medium rolling pressure. In the equation (3) **b** and **B** represents the semi-product width before and after the rolling process, and $\mathbf{l_c}$ represents the contact arc length between the rolling mill cylinders and the semi-product in horizontal projection. The length of the arc horizontal projection it is calculated with:



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$$l_c \cong \sqrt{R \cdot \Delta h} \tag{4}$$

Knowing the values of the forces required for the rolling process, as well as the contact arc length between the material and the rolling mill cylinders, have been obtained the real rolling pressures values:

$$p_m = P_t / S_c = \frac{F}{\left[(b+B)/2\right]\sqrt{R\Delta h}} \tag{5}$$

in which: F is the measured force of rolling ; b, B are the semi-product dimensions before and after the rolling process; Δh the difference among these dimensions.

Considering that in the case of these determinations the test – pieces used in the rolling process are from wire of round section with the initial diameter ϕ (fig. 5.a), it is considered that for the first rolling H = ϕ and b = 0, because the initial contact between the rolling mill cylinders and the semi-product is tangent. In these conditions the (3), (4) and (5) are becoming: [1]

$$S_c = (B/2) \cdot l_c \tag{6}$$

$$l_c \cong \sqrt{R \cdot (\Phi - h)} \tag{7}$$

$$p_m = \frac{F}{\frac{B}{2}\sqrt{R \cdot (\Phi - h)}} \tag{8}$$

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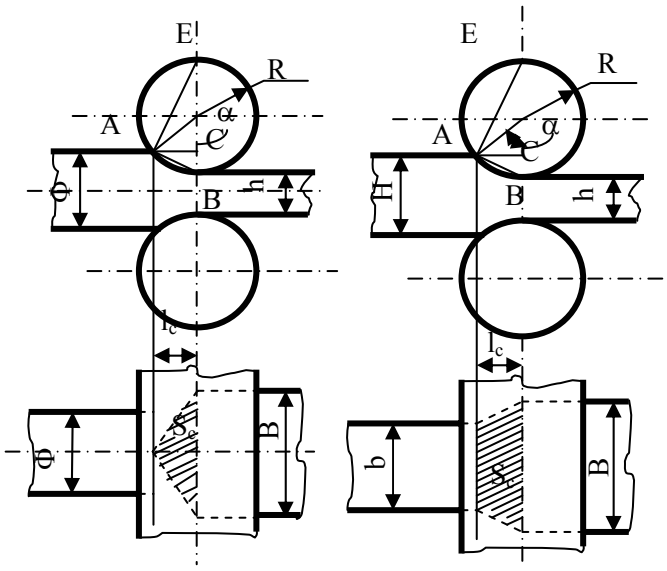


Fig. 5.a;b. The projection of the contact surface $S_c$ between the semi – product and rolling mill cylinders: a. for the first rolling process; b. for the next rolling processes [1]

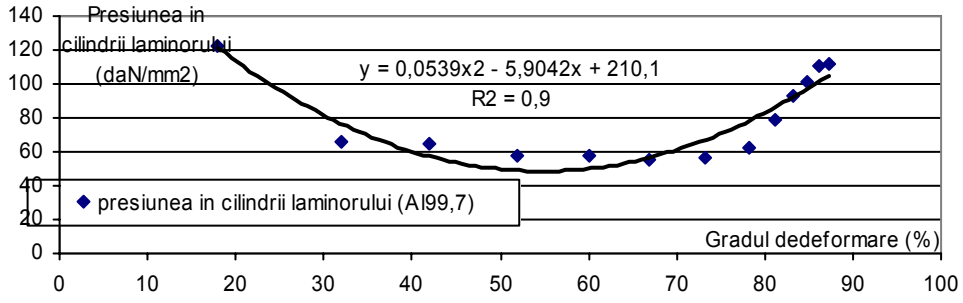


Fig.6. The variation of the pressure in the rolling mill cylinders during the Al99,7 rolling process

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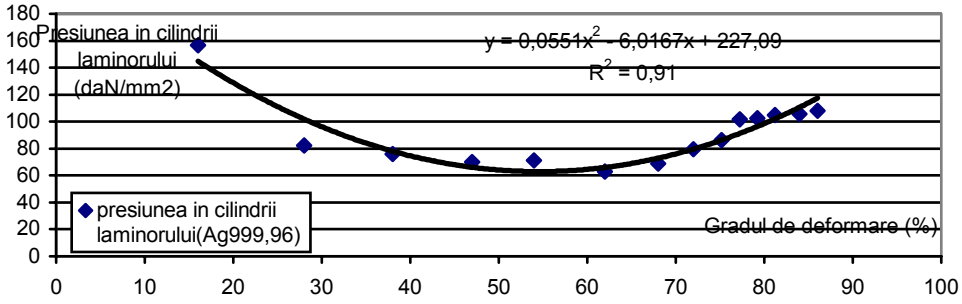


Fig.7. The variation of the pressure in the rolling mill cylinders during the Ag999,96 rolling process

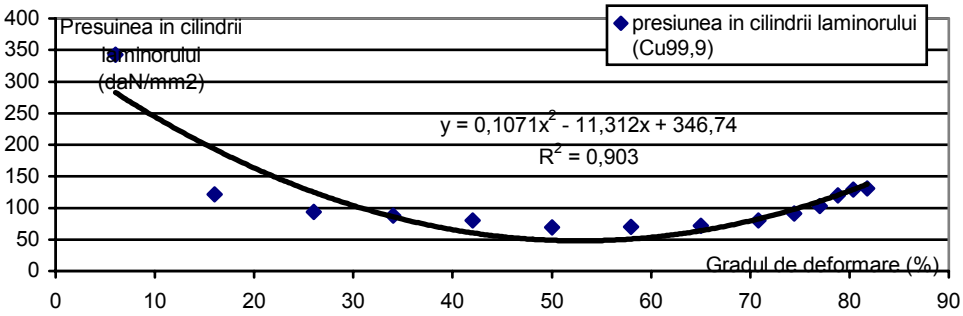


Fig.8. The variation of the pressure in the rolling mill cylinders during the Cu99,9 rolling process

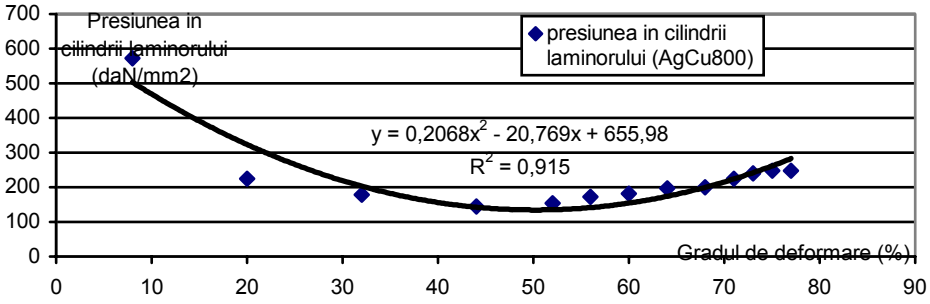


Fig.9. The variation of the pressure in the rolling mill cylinders during the AgCu800 rolling process

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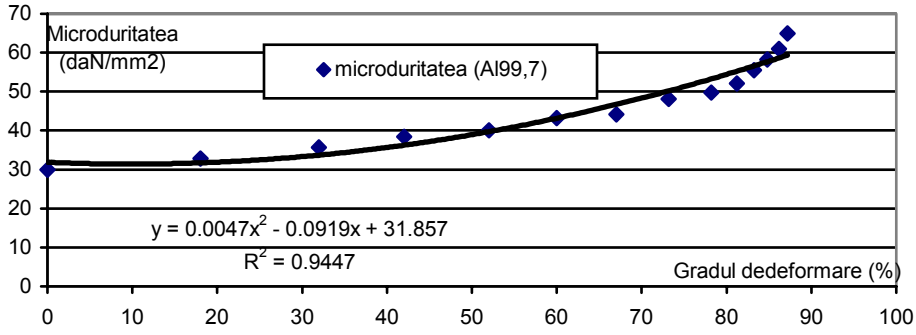


Fig.10. The variation of the micro hardness varying with the relative deformation level during the Al99,7 rolling process

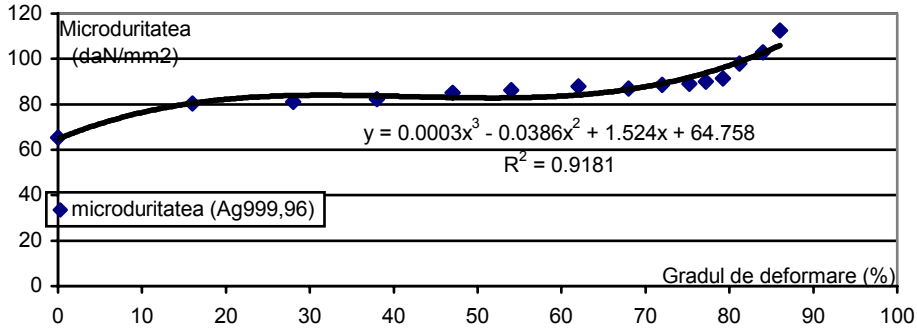


Fig.11. The variation of the micro hardness varying with the relative deformation level during the Ag999,96 rolling process

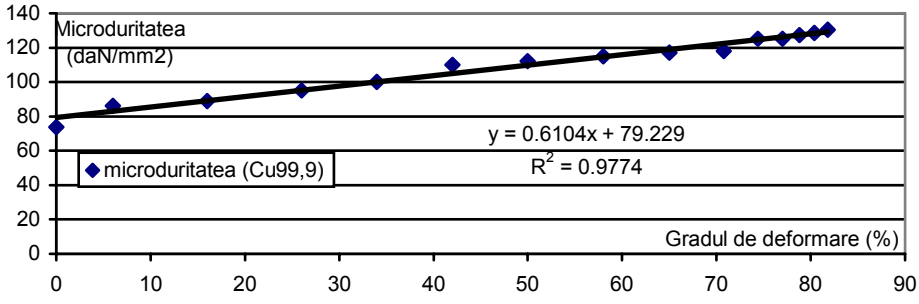


Fig.12. The variation of the micro hardness varying with the relative deformation level during the Cu99,9 rolling process

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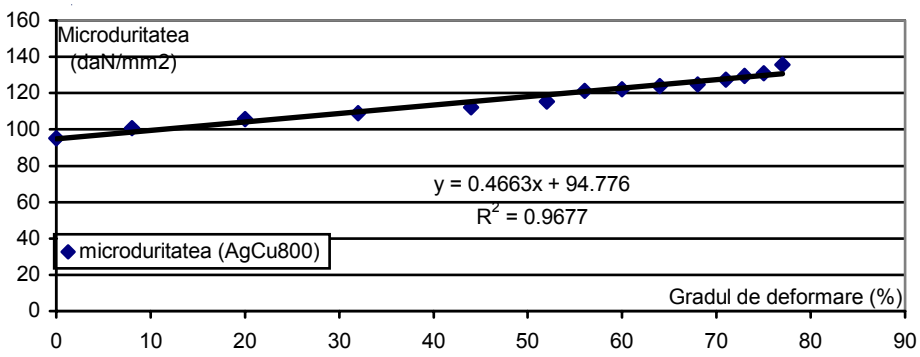


Fig.13. The variation of the micro hardness varying with the relative deformation level during the AgCu800 rolling process

Graphics from figures 6 – 9 presents the medium variations of the pressures in the rolling mill cylinders in accordance with the relative deformation level. Analysing these graphs results that these variations take place according with polynomial second grade laws, whose equations are written on the specific graphics. Variation curves present:

- A descendant section in which the medium pressure in the cylinders decreases according with the increasing of the entire relative level of the deformation, explained by the increase of the contact section between the semi-product and the rolling mill cylinders (this section increase takes place because of the expansion of the contact between the semi-product and cylinders, through the transformation by rolling process of the circular section in rectangular section);
- A minimum that corresponds to a maximum contact surface between the semi-product and cylinders.
- An ascendancy section in which the medium pressure in the rolling mill cylinders increases depending on the increase of the entire relative level of the deformation simultaneous with the decrease of the contact section between the semi-product and the rolling mill cylinders, because of the hardening phenomenon of the metal.

From the comparative study of these graphics results that the medium pressures form the rolling mill cylinders increase while the metals plastic properties decrease.

$$p_{m(Al99,95)} < p_{m(Ag999,96)} < p_{m(Cu)} < p_{m(AgCu800)}$$

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*6.2. The Micro hardness*

In the case of the cold rolling process of the semi-products, under the recrystallization temperature, or in the case that the speed of rolling is smaller than the deforming speed, it takes place a hardening of metallic material and a growing of the deforming resistance follows it. This phenomenon is [23 27 30 31]:

- characteristic to the majority of metals (excepting Pb and Sn , these metals having the recrystallization temperature smaller than the rolling temperature, of the medium)
- depending on the flowing level of the metal, or of the semi-product section for rolling.
- depending on the purity level of the metal, so that on pure metals (Ag 999,96), the hardening is smaller than on alloys of respective metals (AgCu 800).

By analyzing the hardening variation curves, fig. 10-13, resulted at the rolling process it results the following :

- the variation of the micro hardness depending on the relative deformation grade takes place after variation laws: linear in case of AgCu800 and Cu99,9 , second grade polynomial in case of A199,7 and third grade polynomial in case of Ag 999,96:
- the appearance of these curves, no matter the variation law, is ascending in the way of the micro hardness growth with the deformation level;
- the variation of the hardness shows the hardening of the material, so the more plastically the material is the smaller the hardening is, so the hardness value is smaller:

$$HV_{100(Al99,95)} < HV_{100(Ag999,96)} < HV_{100(Cu)} < HV_{100(AgCu800)}$$

- the more plastically the material is, the higher the entire relative deformation level is, in the same trying conditions:

$$\varepsilon_{Al99,95} > \varepsilon_{Ag999,96} > \varepsilon_{Cu} > \varepsilon_{AgCu800}$$

- by choosing one optimal deformation grade, hardness of the materials used in the rolling process did not imposed thermal treatments for recreation of the plastic properties .

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## 7. CONCLUSIONS

The paper presents the results obtained according with the experimental researches regarding the fine silver and the silver alloy AgCu800 behavior, after rolling process attempts. Analyzing these results we can conclude the following: at the rolling process one must consider that the flow limit increases while the rolling section decreases; the obtained quality of the semi-product through the rolling process depends on the constructive variant of the device used for this operation; the material through its physical – mechanical properties influences directly the rolling process; the respect of the technological process specific for the rolling process has an important part in obtaining of the qualitative parameters of the rolled semi-product; the proper utilization of the technologic process is very important for the obtaining of the qualitative parameters of the rolled semi-product.

The conceived and realized stand for the effectuation of the experimental researches, allows simultaneously with the rolling process, the determination with precision of characteristic parameters of this operation: the deformation level, the deformation force, the pressure etc. The adjusting at the quota of the rolling mill can be done with a high precision. The used rolling mill in these experimental researches allows the rolling in a great dimensional range of many materials: aluminum, copper, silver, silver alloy. The comparative study of the metals used at the rolling process: AgCu999,96; AgCu800; Cu99,9; Al99,7 aim at the establishment of the values of the main characteristic dimensions of the rolling process and also, considering the offered dates by the specialty literature (regarding the copper and the aluminum) and knowing that these materials have the same behavior from the workability properties point of view, the checking of the obtained dates at these measurements.

In conclusion:

- Medium pressures form the rolling mill cylinders increase with the decrease of the plastic properties of metals.
- In the case of the semi-products rolling at cold takes place a hardening of the metallic material and so the deformation resistance increases.
- The micro-hardness is dependent of the purity level of the metal, so at pure metals, this one is smaller than the one from respective metal's alloys.
- The variation of the micro-hardness considering the relative deformation level takes place regardless of the material nature, while the micro-hardness increases the deformation level decreases.

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- Values of the micro-hardness demonstrate the material hardening, so as plastic the material is as smaller the hardening is, so the micro-hardening value is smaller.
- By choosing an optimal deformation coefficient, the materials hardening from the rolling mill attempting doesn't require thermal treatments for plastic properties recover.

By respecting the literature of specialty recommendations, the choosing of some technological parameters, the obtained semi-products at the rolling process attempt, do not present deficiencies from witch the rejection of the proofs result.

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