ORIGINAL ARTICLE   **OPEN ACCESS**

Mechanical Processes Created in the Contact areas of Parts and units during touching. Tactile theory

Aslanov Jamaladdin Nuraddin
Azerbaijan State University of Oil and Industry
Department "Oil-gas equipment"
Az.1010 Azerbaijan, Baku, Avenue Azadlig, 20
E-mail: tribo72@mail.ru,

ABSTRACT

For the first time, the physical essence of tactile event as well as the scientific explanation of gravitational force that occurred between touching surfaces and tactile point has been given/explained in this article. On the basis of acquired analytic expression, dependence between the tactile point and gravitational force that occurred between touching surfaces has been determined and known that: At the first case where the tactile point is under 1, gravitational force between the surfaces are being smaller than the force makes tactiling. Surface gravitational force tries to make ideal contact area destroying the particles stays between the initial tactile plane and ideal tactile plane. In the second case, the surfaces gravated each other with the same force of force that creates touching considering the ideal contact area are available. As a result, surfaces are gluing to one another completely as if trying to recover the overall amount clinging to each other. If the surfaces have been made by the same material, then the surfaces will make one whole part joining to each other and by restoring the balance between crystals. Analysis of these events indicates that gravitational force between the surfaces determines the mechanism of mutual relations of tactile surfaces.
Keywords: Tactile point; tactile theory; tactile surfaces; gravitational force

INTRODUCTION

When friction and scratch are studying in the closing devices parts and nodes of Christmas tree firsthand in plugs of valves there some problems arise that is impossible to answer these issues with known methods of friction. The perfect study of Contact and mechanical processes arising from contact is required to calculate friction force arising in the parts and units of equipment that working under pressure in contact with bending force and to research scientific bases of scratches happen in the contact surfaces [4,6].

The mechanism of impact resistance forces made on the parts and units that is under contact, in the high-purity class contacting surfaces, mechanical process arising in the contact areas and surfaces bent under pressure as well as better understanding of physical contact events will stimulate the development of science and technology issues [7].

Contact and physical phenomena's arising from contact after the moment of tactile between the objects being in contact with each other suggests the study of tactile phenomena occurring between tactile objects in the perfect investigation of mechanical processes. Tactile is a physical event that is unique and its scientific theory has not been determined up to date as a separate scientific direction [4].

Referring to clarity of the issue let us accept that 2 tactile objects are under the force pressure at one point in the airspace in the passage of time. Pressure force impacts in the perpendicular direction to the contact surface. Different numbers of planes are perpendicular to each other in tactile point. There is such a plane in the direction of pressure force and parallel plane to the contact surface that these 2 planes are perpendicular to each other in tactile point. The planes will be called tactile planes (pic. 1.1).

METHODOLOGY

There is no ideal flat and clean surface concept in the universe. Surface has got known characteristic. When the objects touch each-other the meeting surfaces are in contacts of the actual area at one or more

than one point (in the number of "n" bumpies) [1, 2, 5]. Each contact point in the area of actual contact (bumpies) pressurize each other under the tactile plane. Each seat plane of these planes in addition to being parallel to the surface, they locate away from each other in the distance of heights up the difference of bumpiest(pic.1.2).

Let us accept the existence of ideal surface (with ideal proportions) in comparison with the exist surfaces. There a tactile plane that was accepted in accordance with perfectly clean surface where all the dots in this plane are placed at the same height (pic.1.2). We will call this plane an ideal tactile plane. Let's assume the completion of the area in ideal contact area through the ideal tactile plane from the initial actual tactile area below the ideal levels of tactile planes of tactile area. Even if the number of dots is n=[1÷∞] in the factice contact area, the final power that made by mechanical process and arised by pressure force is trying to complete the contact under one ideal plane which begins under the parallel planes and the quantity acceptance is "m"

 If we call -T-as a tactile point what means the ratio of current actual contact area while the items touching each -other in the space to the ideal surface area , then

$$T = \frac{S_f}{S_i}$$

(1.1)

Where, Sf -actual contact area , Si –ideal contact area

The conducted experiments show while increasing the purity class of surfaces, they are inclined to glue each other which ones are in contact as if they are gravating each other. After taking the pressure force this force tries to tend the contact [5]. So, while having closer cleanliness degree on ideal contact area besides pressure power there appears another gravity characterized unit which tries to keep the touching objects in the same volume by creating ideal contact area making the first massive and ideal massive get smoother tactile surface.

 This gist arising because of pressure force is a new force, which tries to restore the crystal lattices joining the surfaces to each other that complete the parallelility between surfaces under ideal tactile from the crystal plane where it crushes a large volume of material stayed between tactile planes. This force is the nature of gravitational force that tries to connect the surfaces to each other.

Tactile point of touch is a scalar quantity which indicates gravity power between surfaces created by tactile surfaces of actual (factice) contact changing as much as touching unit and that gravity has been created by surfaces which touched each other by having perpendicular pressure in unsmooth areas of touching surfaces[4].

According to the latest results from the aforementioned can say that the gravitational force between the surfaces in the touching surfaces that create touching in the direction of perpendicular to the tactile surface in difference of tactile point and trying to build the touching surfaces each other and trying to keep at the same capacity of crystal hucks. Then,

$$\vec{F}_{caz} = \vec{F}_t \cdot T$$

(1.2)

Where, Fcaz- gravitational force between the surfaces, Ft- pressure force that creates tactile, T- tactile point.
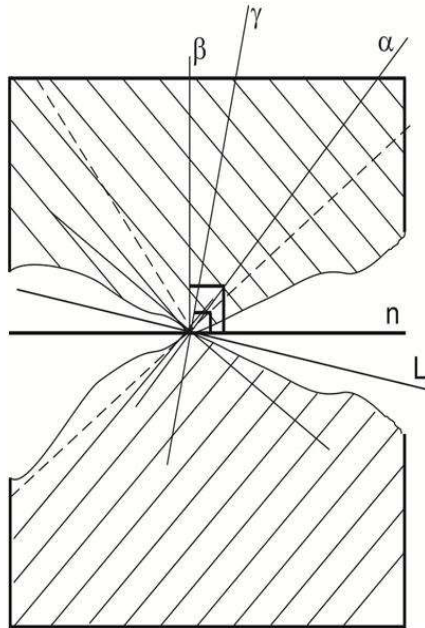
Tactile point is   T ≤ 1.

At (2)

Where T < 1 $\vec{F}_{caz} \langle \vec{F}_t$;

Where T=1 $\vec{F}_{caz} = \vec{F}_t$.

At the first case where the tactile point is under 1, gravitational force between the surfaces are being smaller than the force makes tactiling. Surface gravitational force tries to make ideal contact area destroying the particles stays between the initial tactile plane and ideal tactile plane.

 In the second case, the surfaces gravated each other with the same force of force that creates touching considering the ideal contact area are available. As a result, surfaces are gluing to one another completely as if trying to recover the overall amount clinging to each other. If the surfaces have been made by the same material, then the surfaces will make one whole part joining to each other.

Analysis of these events indicates that gravitational force between the surfaces determines the mechanism of mutual relations of tactile surfaces.
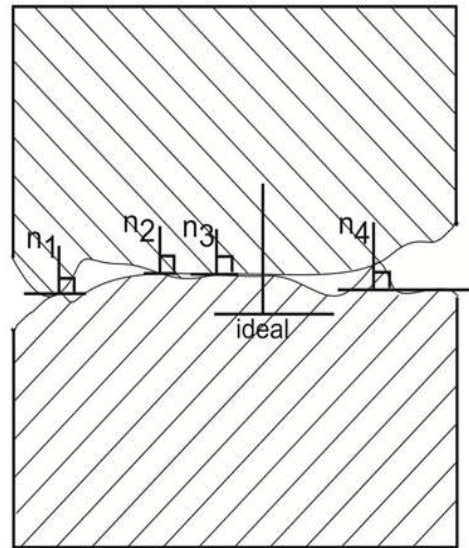
Pic. 1.1   Pic.1.2

RESULT
1. Tactile event has been elucidated based on the characterization of the relationship of the surfaces, which are in contact during touching
2. For the first time, quantitive characteristics of tactile point and gravitational force between surfaces have been determined and analytic formula has been shown that determining the dependence of gravitational force from tactile point.

DISCUSSION
The mechanism of impact resistance forces made on the parts and units that is under contact, in the high-purity class contacting surfaces, mechanical process arising in the contact areas and surfaces bent under pressure as well as better understanding friction events will stimulate the development of science and technology issues [5,6,7].

The perfect solution of such kind of issues is impossible without determining the mechanism of mutual relations between the areas of the contact surfaces

Purpose of the work: determination of the mechanism of resistance forces occurred between surfaces and mutual relations between contact areas in the touching surfaces and as well as detection of values that characterizes touching.

Based on the purpose, approaching to the contact process between the surfaces is a new scientific direction and led to discovery of physical nature of the tactile event. Friction and mechanical wear phenomena is impossible without touching. The essence of friction and mechanical wear takes its starting nature parameters from tactile event's nature parameters.

Disclosure based on the tactile theory of touching will lead to the discovery of the nature of mechanical phenomena and frictions as well as mechanism of resistance forces occurred between surfaces in a proper way. The following results have been obtained on the basis of theoretical and experimental studies that has been carried out.

Touching process- is a mechanical process which comes out from gravity between surfaces trying to complete contact surfaces and crystal cages in the same volume repairing the balance between crystal cages of contact surfaces, attempting to construct contact surfaces with each other while heights of unevenness between contact areas getting so much closer to crystal cages distance by pressure forces creating touch.

Touching point is a scalar quantity which indicates the touching unit amount of change of gravity between surfaces created by actual contact of touching areas and perpendicular pressure force of contact surfaces during touching process.

Gravity between surfaces is a gravity repairing the balance between crystal cages of contact surfaces attempting to complete them in the same volume and construct contact surfaces with each other and it

has different touching unit rate from touching force on the touching surfaces created in a perpendicular direction to the surface.

Scientific research work carried out by Ph.D. J.N. Aslanov at Azerbaijan State University of Oil and Industry in the department of Oil-Gas equipment as well as discussed in Scientific Seminar and meeting of the department. The main provisions of the scientific research work is registered and protected by Copyrights Agency of Azerbaijan Republic [2,3].

CONCLUSION

At the work, scientific explanation of tactile theory has been given and based on this theory for the first time quantitive characteristics of tactile point and gravitational force between surfaces have been determined and analytic formula has been shown that determining the dependence of gravitational force from tactile point.

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