United States Patent [19]

Bridger

[11] **3,740,096**

[45] **June 19, 1973**

[54] **ORTHOPEDIC SEAT**

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[73] Assignee: **Bridg-A-Back, Inc.,** Columbus, Ohio

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[21] Appl. No.: **140,242**

Related U.S. Application Data

[62] Division of Ser. No. 829,582, June 2, 1969, abandoned.

[52] **U.S. Cl.** **297/459,** 297/231, 297/458

[51] **Int. Cl.** **A47c 7/02**

[58] **Field of Search** 5/361; 297/454–459, 230, 231

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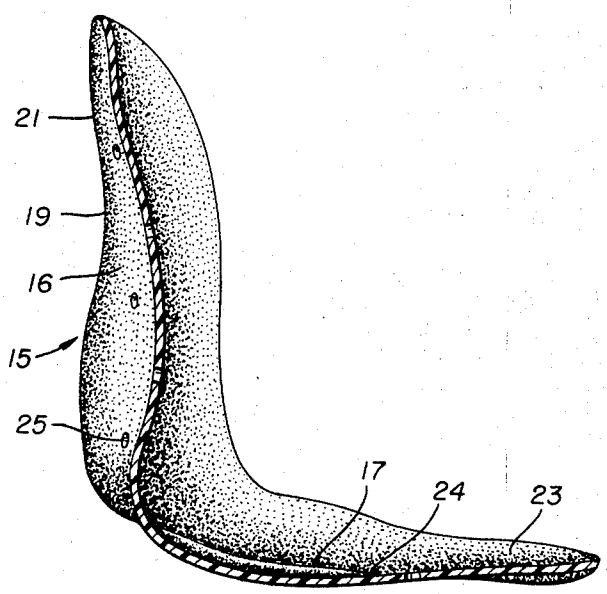
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[57] **ABSTRACT**

An orthopedic seat comprising a lower substantially horizontal seat portion and an upper substantially vertical back portion rigidly joined to the seat portion. The lower portion is shaped to act as a base support for the pelvis and sacrum which, in turn, will act as a base for the lumbar dorsal and cervical vertebrae, and the back portion is designed to properly position the vertebrae of a person seated on the lower portion to correct them automatically.

4 Claims, 13 Drawing Figures



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SHEET 1 OF 3

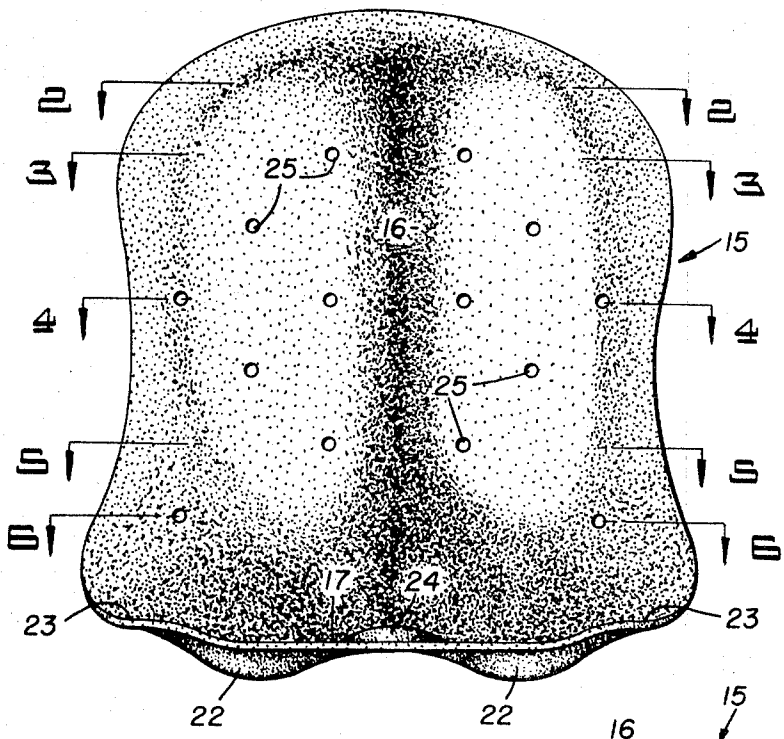


Fig 1

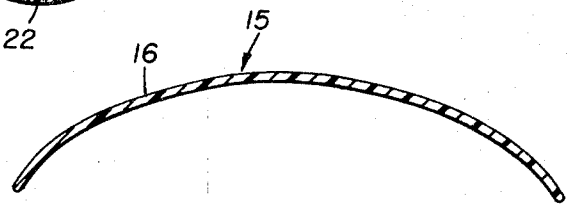


Fig 3

Fig 2

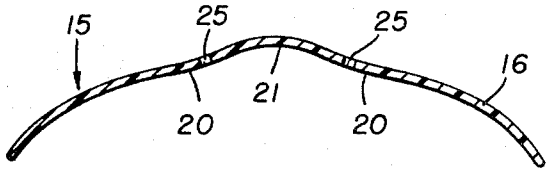


Fig 4

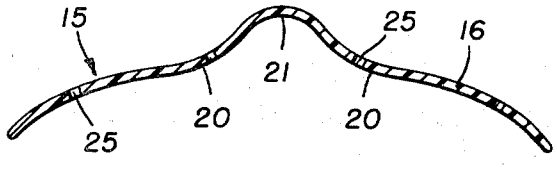
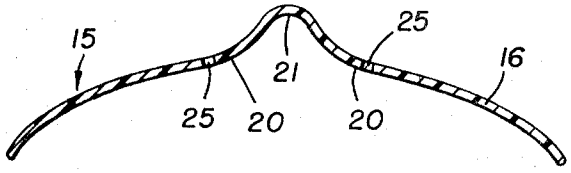


Fig 5



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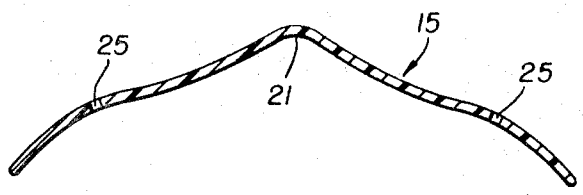


Fig 6

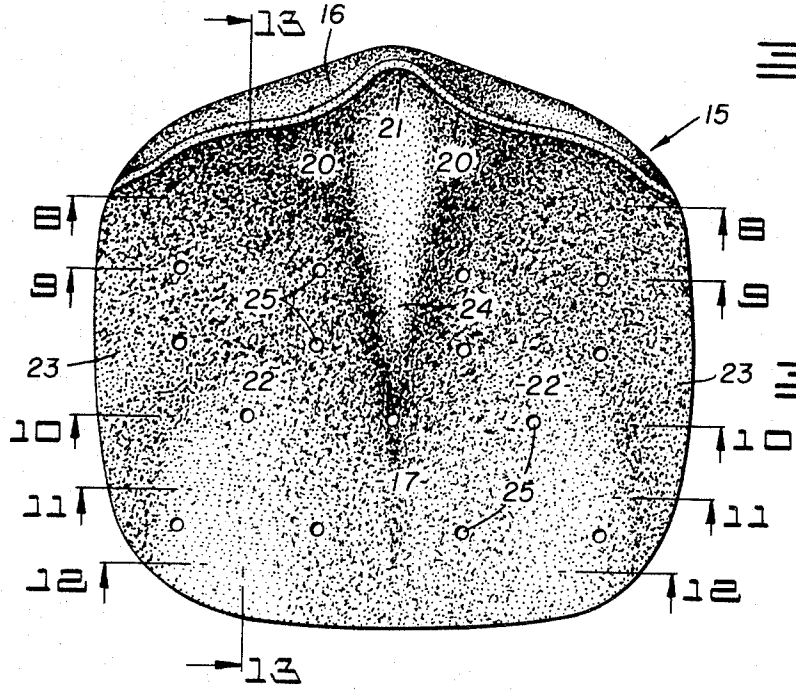


Fig 7

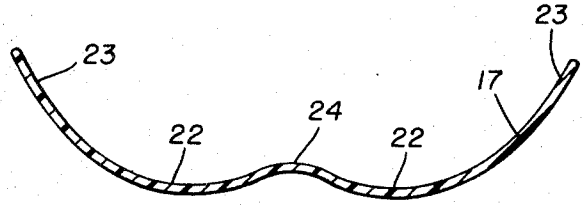
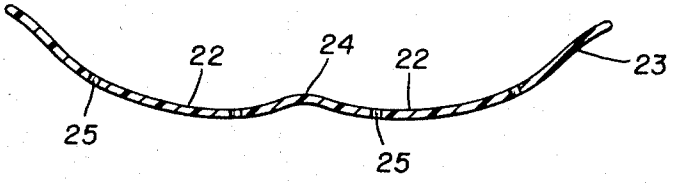


Fig 8

Fig 9



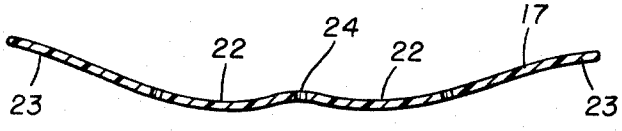


Fig 10

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Fig 11

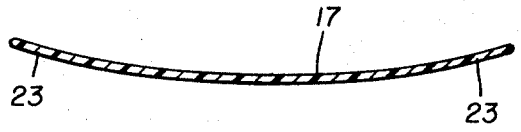


Fig 12

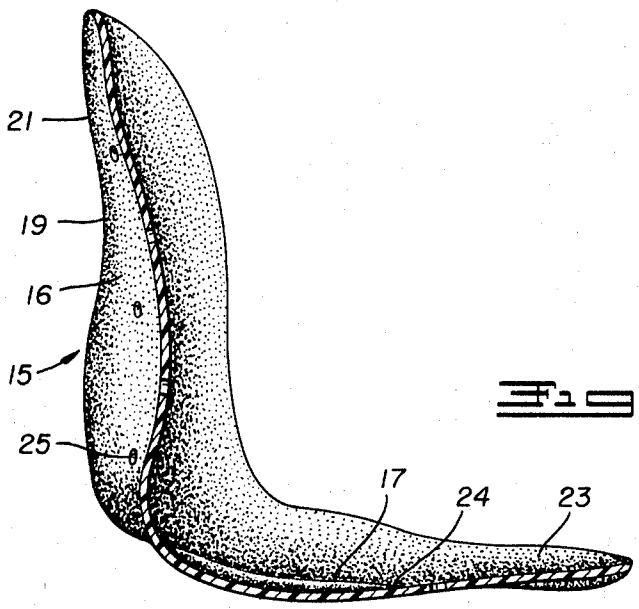


Fig 13

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ORTHOPEDIC SEAT

This application is a continuation-in-part of my co-pending application Ser. No. 829,582 filed June 2, 1969.

BACKGROUND OF THE INVENTION

The basic function of the seat of the present invention is to create perfect sitting posture. This is accomplished by two curves in the back of the seat, which when placed in the lumbar area, create a vertical depression extending for a substanital height which positions the lumbar vertebrae so as to correct them automatically. Complete reduction of the hypo lumbar lordosis is created in this position. The area encompassing the gluteal region is so designed as to stabilize the sacrum between the two iliac crests. The long curved depression running in line with the erect spinal column creates a free suspension of the column and removes all pressure from it.

An important feature of the seat is that the vital organs are removed of harmful pressures found in every case of abnormal sitting posture. The abdominal musculature is positioned so as to create normal tonus, thus reducing pressures in this area, and minimizing myofascial strain not only to this area, but also to the fascia surrounding the musculature of the low back.

Certain beneficial results will obviously follow to users of this seat such as perfect eye to paper distance when writing and an increase in safety in motor cars as the driver will now be in full control of his vehicle instead of slouching down in the depths of his seat. Reduction of low back conditions, gastro-intestinal conditions, abnormal heart conditions and abnormal conditions of the hips and pelvis will also result from use of this seat over long periods. Thus, the seat creates a sitting posture with free suspension of the spine, thereby affording the user definite benefits.

The design of the seat creates a perfect anatomical balance in the sitting position. This is accomplished by the various curves of the seat aligning the lumbar vertebrae into the anatomical curve most beneficial to the body. The vertebrae lie in perfect juxtaposition, with reduction of weight bearing pressures on both the anterior and posterior portions of the intervertebral discs. More simply, the weight is distributed throughout each disc and vertebral body evenly, thus creating a mechanical balance which in turn creates balance between antagonistic muscle groups and ligaments, thereby reducing all abnormal strain on these anatomical structures.

The lower portion of the seat acts as a base for the pelvis and sacrum, which in turn will act as a base for the lumbar, dorsal and cervical vertebrae. This portion of the seat is designed so as to reduce all torque and strain on the muscular insertions of this region, and acts as a foundation for the pelvis and the rest of the spinal column. This area of the seat is invaluable in cases of sacroiliam strain, and pathological conditions of the inter-vertebral discs and hips. It acts as a firm base in oversoft seats.

The seat can be made as a shell from different varieties of plastic, but may be moulded out of any suitable material. It may be padded and/or covered, and may be inserted into seats and chairs as a foundation to their existing contours. It may or may not have ventilation holes or designs, and may be fitted onto legs or bases, for use in the home or office furniture. The shell may

be used as a portable unit, and more especially as a portable base for use on oversoft seats, e.g. motor car seats.

IN THE DRAWINGS

FIG. 1 is a front elevational view of the seat shell;

FIG. 2 is a longitudinal sectional view taken through the back of the seat-shell at the level indicated at line 2—2 of FIG. 1;

FIG. 3 is a similar view taken at the level indicated at line 3—3 of FIG. 1;

FIG. 4 is a similar view taken at the level indicated at line 4—4 of FIG. 1;

FIG. 5 is a similar view taken at the level indicated at line 5—5 of FIG. 1;

FIG. 6 is a similar view taken at the level indicated at line 6—6 of FIG. 1;

FIG. 7 is a plan view of the seat shell of FIG. 1;

FIG. 8 is a vertical sectional view taken through the seat of the shell of FIG. 7 at the position indicated at line 8—8;

FIG. 9 is a similar view taken at the position indicated at line 9—9 of FIG. 7;

FIG. 10 is a similar view taken at the position indicated at line 10—10 of FIG. 7;

FIG. 11 is a similar view taken at the position indicated at line 11—11 of FIG. 7;

FIG. 12 is a similar view taken at the position indicated at line 12—12 of Figure; and

FIG. 13 is a side elevational view of the seat shell.

Referring to FIGS. 1, 7 and 13 of the drawings, 15 indicates generally a body supporting device or seat shell having a substantially vertical back rest portion 16 and a substantially horizontal seat portion 17 at the rear thereof. The device is mainly of an unyielding material such as a suitable synthetic plastic material with or without the addition of glass fibers as reinforcement.

The back rest portion 16 is contoured as shown, to fit the back of a person. It has two convex areas 20 on either side of a central depression 21 to abut the back of a person so that the spine is received with clearance in the central depression 21. It will be noted from a comparison of FIGS. 2 to 6 that the central vertical depression or groove in the back 16 starts just below the upper edge of the back portion 16 and gradually increases in depth until the seat portion 17 is reached. Thus, the central depression or groove 21 is deep and narrow at its lower end adjacent the seat portion and gradually increases in width and decreases in depth until a point adjacent the upper edge of the back portion 16 is reached where it merges with the adjacent contour area of the back portion. The depression 21 is curved forwardly at 19 adjacent the upper edge of the back portion to correspond to the general curvature of the spine, as best shown in FIG. 13. The depression will therefore allow the vertebrae to assume their proper disposition. It will also be noted that the side edge portions 18 of the back rest portion curve forwardly throughout the vertical extent of the back portion.

The seat portion 17 is also contoured to position the body of a person and curves upwardly and rearwardly into the back portion 16 as indicated best in FIG. 13. It has two depressions or cavities 22 on either side of a central rounded or convex ridge 24. It will be noted from a comparsion of FIGS. 8 to 12 that the central ridge 24 in the seat portion starts at the back portion where it is of maximum width and height and gradually

decreases in both toward the front edge of the seat until adjacent that front edge the ridge merges into the adjacent contour areas of the seat. It will also be noted that adjacent the back portion **16** of the seat **17**, the side edges **23** thereof are curved or turned upwardly sharply and that they gradually flatten out toward the front edge of the seat portion. By being contoured in this manner, the seat portion **17** ensures that the sacrum and ischial processess are evenly and confortably supported.

When a person is seated in the device **15**, the contoured back rest portion **16** ensures that the back of the person is supported in the correct anatomical position without sagging or curving, while the seat portion **17** supports the seat of the body in the manner previously described. The device thereby assists in counteracting fatigue which may arise from an incorrect body posture.

The back rest portion **16** as well as the seat portion **17** may have vents **25** to dissipate body heat generated by a person seated in the device. Also, it is preferred that the seat portion **17** have its upper surface roughened to prevent sliding forward of a person seated thereon. Also, if the device is merely to rest on another seat, it is preferred that its lower surface be roughened to prevent sliding thereon.

The device **15**, shown in the drawings, is shown as a portable shell for use wherever required, e.g. resting on seats. The device may, however, also be a permanent fixture, e.g. by being built into a vehicle seat, a chair, or sofa, or by providing it with supporting means, such as legs.

Thus, according to the invention, there is provided a device for supporting the body of a person in a seated position, the device comprising a back rest portion having a central depression for receiving the spine of a person with clearance and being contoured to fit the back of a person, and a seat portion secured transversely to the back rest portion. The back rest portion has two convex areas, one on either side of the central depression, which are arranged to support the back of a person so that the spine is received with clearance in the central depression. The seat portion is contoured to the body of the person for supporting the sacrum and ischial processes and for stabilizing these regions. The back rest portion as well as the seat portion are mainly unyielding to facilitate the supporting of the spine of a person in a desired correct anatomical position without sagging or curving. However, the external outer side edges of the back rest portion may be resiliently flexible to permit this portion to adjust itself to the contours of a person's back supported therein.

To more fully describe the seat of the present invention, it should be pointed out that the dimensions and shape of the contour areas are relatively specific and slight deviations interfere with or totally destroy the beneficial aspects of the seat.

For example, convex shaped central gluteal ridge **24** is eight and one-half inches long with the highest elevation toward the rear of the seat portion **17** and then flowing gently downwardly to smoothly merge with the front portion. This central gluteal ridge **24** is designed specifically to separate the gluteus maximus and minimus musculature. The amount or degree of separation is also controlled by the lateral shape and dimensions of the cavities **22** and outer side edges **23.** The dimensions and contour of the side edges **23** and the intermediate contour **22** are specifically designed to "cup" or "mold" support for the buttocks in cooperation with the separation caused by central ridge **24** to create a controlled balance of forces both laterally and medially. This configuration prevents the creation of unnatural stresses and strains on the pelvic area such as are caused by splaying of the buttocks which occurs in soft or flat seats. Splaying of the musculature in this area creates undue tension on the muscular and ligamentous insertions which has an adverse effect on the osseous structure of the pelvis which in turn affects the mechanical balance of the osseous structure of the lumbar spine, and associated superior osseous structures.

The specific design of seat portion **17** as described above therefore permits the osseous structure of the pelvic area to assume a normal position with no undue or abnormal strain or stress on the pelvic area.

The critical dimensions and shape of seat portion **17**, in addition to central ridge **24**, are the depth of cavities **22** which are 1 ¼ inches at their deepest point and which rather sharply curve upwardly toward outer edges **23.** Also the distance between the edges **23** as measured from edges **23** across the curved surface of the junction between the rear portion of ridge **24** and back portion **16** is very important although not quite as critical as the previously given dimensions. It has been discovered that this dimension should dimension 22 inches which gives appropriate control of the degree of separation achieved by ridge **24** and the support needed to achieve an even balance of forces on the weight bearing centers of the person seated. Further, it has been discovered that these dimensions are valid over a very wide range of different weights and heights since the osseous structure in the pelvic and lumbar areas varies a relatively small amount.

This in turn, places the lumbar spine in a proper and normal configuration since the immediately connected pelvic area is free of undue stresses. Therefore with the pelvic area and the lumbar spine initially placed in a correct mechanical position, both superiorly and anteriorly, the entire osseous and soft connective tissue surrounding this area and superior to it will be corrected mechanically and hence anatomically, provided however, that there is no interference by way of foreign abnormal pressures to the soft tissues and osseous structures of the lumbar region to prevent compensatory movement or positioning.

This is accomplished in the present invention by the central depression **21** in back portion **16.** This construction enhances the sought for compensatory osseous movement of the vertebral column since the spinal column is freely suspended in this area with no pressure on either the immediate soft tissues or on the oseous structure.

Therefore a "chain reaction" is set up by positioning the pelvis and lumbar spine correctly and then permitting the superior structures, the thoracic, and cervical vertebrae to assume a normal position free from interference by abnormal pressure.

It should be noted in conjunction with the foregoing description that the os sacrum is positioned so as not to touch any supporting surface unlike in many prior art seating structures which teach specific protruding supporting areas for this region. In the present construction the os sacrum is free of any foreign pressure so that it may assume its normal position relative to the posi-

tion of the pelvic area which has been placed in the specific position described above.

It is my contention that the inferior skeletal aspects of the spinal column have a direct and inseparable effect upon the superior osseous structure. Therefore any alteration of angle or position of the inferior areas have a direct affect on the angle and position of the superior areas.

Clinical studies have strongly indicated the correctness of this contention. Very simply, the purpose and function of the present invention is to properly position the pelvic area in a sitting position in conjunction with appropriate back support specifically designed to permit the oseous structure and associated musculature to freely assume a normal position without undue, abnormal pressures.

In tests conducted to this point of time, one very important advantage of the present invention was the reduction in all and total elimination in some of the persons tested of back pain or the burning sensation associated with long periods of sitting. This is directly attributed to the elimination of abnormal stresses and strains in prior art chairs which tend to restrict circulation of the blood. This causes the buildup of fatigue waste products in the associated muscle tissues which causes the pain and/or burning sensations. In the seat of the present invention, a more normal blood flow is permitted because of the elimination of the abnormal pressures in those areas which restrict circulation.

Other tests under clinical conditions have indicated relief for persons suffering from injured or diseased discs and other diseases affecting the oseous structure of the vertebral column.

The device may have vents in either or both of the back rest and seat portions for dissipation of body heat. Furthermore, the body-contacting surface of the seat portion may be roughened to resist sliding of a person seated therein. The underside of the seat portion may also be roughened to resist sliding between the device and a surface on which it is supported. If desired, the device may be portable, i.e. for use on a supporting surface such as in vehicles, on the ground, on chairs or the like, or by being built into a vehicle or other seat.

The device may be moulded from a synthetic plastic material with or without the addition of glass fibers or other reinforcement. The moulding operation may, for example, be effected by injection or vacuum moulding.

I claim:

1. A seat shell comprising a substantially horizontal seat portion and a substantially vertical back portion extending upwardly therefrom at the rear portion thereof, said back portion having a central recess formed therein and extending from a point adjacent the seat portion upwardly for receiving the spinal column of a person seated on said seat portion; said recess having a maximum depth and minimum width at its lower portion adjacent the seat and gradually increases in width and decreases in depth toward the upper edge of the back portion, said back portion including transversely outwardly convex areas on each side of said central recess such that the spinal column of a seated person is received in said central depression with clearance between the bottom of said central depression and the spinal column.

2. A seat shell according to claim **1** in which the recess has a forwardly curved section toward its upper end.

3. A seat shell according to claim **2** in which the seat portion is provided with an upwardly and rearwardly extending gently curved central ridge and transversely curved concavities at each side thereof.

4. A seat shell comprising a substantially horizontal seat portion and a substantially vertical back portion extending upwardly therefrom at the rear portion thereof, said back portion having a central recess formed therein and extending from a point adjacent the seat portion upwardly for receiving the osseous spinal column of a person seated on said seat portion; said seat portion being provided with a centrally disposed ridge having its highest portion located adjacent to the junction of the back portion, said ridge extending downwardly toward the front edge of said seat portion and merging with the adjacent substantially flat contours before reaching said front edge, and a pair of transversely curved concavities disposed adjacent to each side of said ridge, each of said concavities terminating at an upwardly curved outer edge.

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