

April 2, 1968

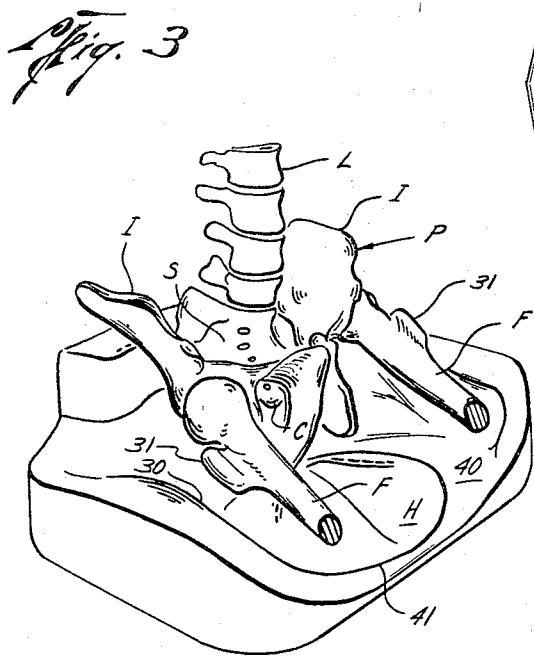
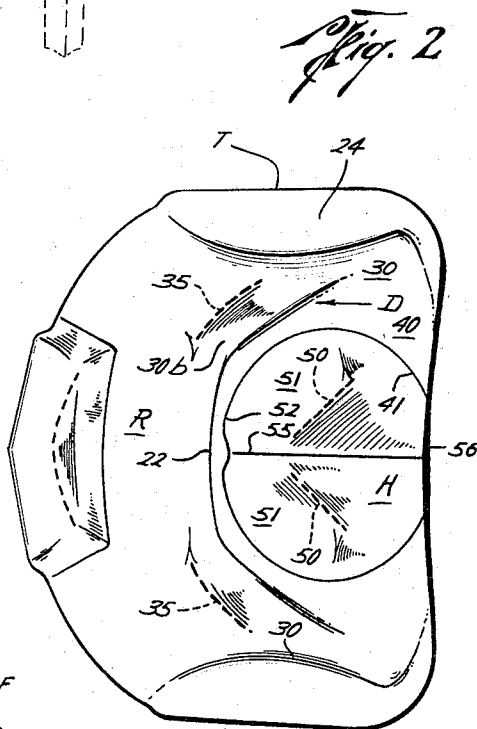
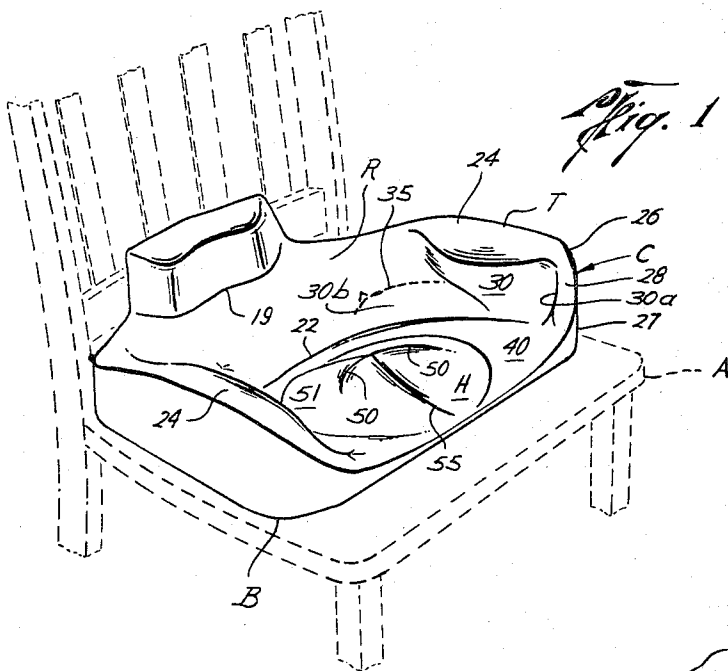
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CONTOURED SEAT CUSHION

Filed July 22, 1966

2 Sheets-Sheet 1



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ATTORNEYS

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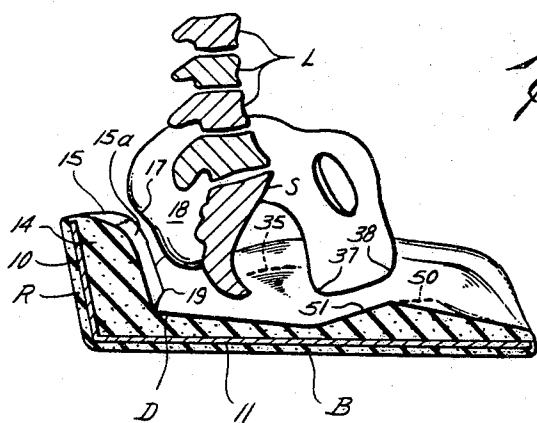
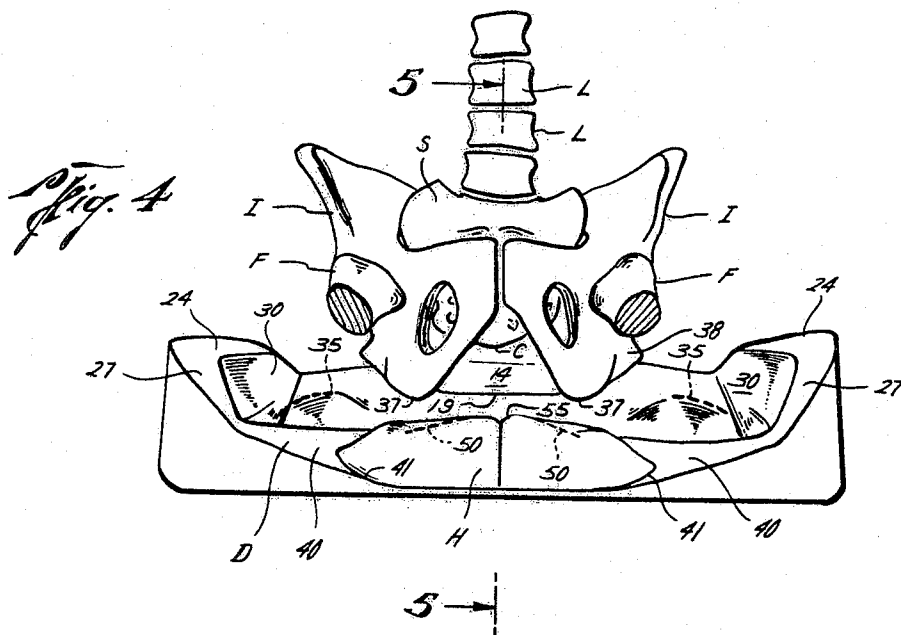
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CONTOURED SEAT CUSHION

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1 Claim. (Cl. 297-459)

ABSTRACT OF THE DISCLOSURE

A seat cushion contoured for properly aligning and supporting the pelvic girdle of a person seated thereon.

Sitting in an erect position in most conventional chairs or bench type seats for extended periods of time is frequently fatiguing due to the failure of such conventional seats to properly support the pelvic girdle. As a result of improperly positioning the pelvic girdle, a substantial amount of weight of the upper body is borne by the superior and inferior posterior articular processes or zygapophysis of the lumbar vertebrae and sacrum which causes fatigue in the low back, tiredness between the shoulders, and an over-all tenseness and weariness.

It is, therefore, an object of the present invention to alleviate these discomforts by providing a contoured seat cushion which will properly align and support the pelvic girdle of a person seated thereon so as to cause the weight of the upper body to be borne by the normal load-bearing portions of the skeletal anatomy including the body portion of sacrum and lumbar vertebrae while relieving compression loading from the zygapophysis of the lumbar vertebrae and sacrum.

Another object of the present invention is to provide a new and improved contoured seat cushion for use on a conventional bench type seat, such as an automobile seat, which includes upstanding portions for engaging the posterior inferior iliac spine as well as the tuberosity of the ischium and the greater trochanter of the femur to thereby properly align the pelvic girdle for comfortably supporting the upper body when seated in an upright or erect position for extended periods of time.

A further object of the present invention is to provide a new and improved contoured seat cushion which is contoured to engage the gluteus maximus and biceps femoris muscles of a person seated thereon to maintain the femurs substantially parallel to each other while comfortably supporting the pelvic girdle, the sacrum, and the lumbar vertebrae.

The preferred embodiment of this invention will be described hereinafter together with other features thereof, and additional objects will become evident from such description.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings forming a part thereof wherein an example of the invention is shown, and wherein:

FIG. 1 is an isometric perspective of the contoured seat cushion of the present invention shown positioned on a chair depicted in phantom;

FIG. 2 is a plan view of the contoured seat cushion of the present invention;

FIG. 3 is an isometric view of the contoured cushion of the present invention with the portion of the skeletal structure that normally engages such cushion shown arranged in the seating position thereon;

FIG. 4 is a front view of the contoured cushion of the present invention with a pelvic girdle portion of the human anatomy shown in the normal position which it occupies relative to the cushion when a person is seating thereon; and

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FIG. 5 is a view taken on line 5-5 of FIG. 4 showing the normal position of the pelvic girdle and the sacrum and coccyx relative to the contoured cushion of the present invention when a person is seated thereon.

Briefly, the present invention comprises a contoured seat cushion indicated generally at C which may be used on a substantially rigid seat such as the hard chair A shown in phantom in FIG. 1, or the cushion C may be used on a soft or yieldable seat, such as the conventional bench type seats found in automobiles. Such cushion C is adapted to position the pelvic girdle P of a person seated thereon. As best seen in FIGS. 3, 4, and 5, the pertinent portions of the skeletal anatomy are the hip or innominate bones I, the sacrum S, which support the lumbar vertebrae L on the hips I, the coccyx C, and the femur or thigh bone F. The cushion C includes a base B having side portions T and a rear portion R mounted thereon which are inclined inwardly and downwardly toward a central hump or dome H which is centrally disposed relative to such sides and rear portion T and R, respectively. As shown in the drawings, the sides T, rear portion R, and hump H are contoured and inclined relative to each other so as to form a generally U-shaped depression D which opens toward the front of the cushion C for receiving and comfortably supporting the portion of the anatomy on which the body rests when seated, as will be explained in detail hereinafter.

With the contoured cushion C of the present invention, the pelvic girdle is supported and aligned in such a manner as to cause the lumbar vertebrae to support the weight of the upper body without imparting a compressive load on the sacrum, coccyx, or the posterior superior and inferior articular processes of the lumbar vertebrae to thereby eliminate a frequent cause of low back pain and general sitting discomfort.

Considering now the apparatus of the present invention in more detail, the cushion C, which is sufficiently large to comfortably accommodate a person sitting thereon, is preferably formed of yieldable material such as foam rubber or one of the other elastomers which is yieldable and will compress when someone is seated thereon. The base B which is provided for strengthening the cushion C may be attached to the cushion C by a suitable mastic or glue or formed integrally therewith as desired. The base B is usually made of steel, but other materials may be used so long as they are sufficiently yieldable so as to flex or deform slightly in response to the weight of a person seated on the cushion C so as to be comfortable and yet sufficiently rigid to prevent the cushion C from deforming appreciably from its preformed shape and size when a user is seated thereon.

As best seen in FIG. 5 of the drawings, the rear seat portion R includes a substantially rigid upstanding support member 10 made of steel or other rigid material and is connected to the base B for strengthening and supporting an upstanding projection or rear pelvic support member 14.

The rear pelvic support member 14 includes an upper ledge portion 15 which is provided to engage and support the posterior superior iliac spines 17 of the ilium 18 as best seen in FIG. 5 of the drawings while leaving the sacrum S and coccyx C free of compressive loading. Such support 14 is normally formed of an elastomeric material such as a foam rubber and is preferably inclined or rounded at the front edge 15a for comfortably receiving the iliac spines 17.

The rear portion of the depression D disposed to the rear of the hump H is inclined forwardly and downwardly from the base 19 of the rear pelvic support 14 to the rear edge of the hump H. As shown in the drawings, the bend 22 of the U-shaped depression referred to hereinabove extends around the hump H.

As shown in the drawings, the side members T comprise three inclined surfaces, namely, an upper surface 24, an intermediate surface 30, and a lower surface 40. The rear portion of the depression D adjacent such bend 22 extends laterally and forwardly to join the upper surface 24 of the lateral side portion T to form a continuous unbroken inclined and curved surface which extends forwardly to substantially the forward end 26 of the side members T. Such rear portion of the depression D and the upper inclined surface 24 which is inclined inwardly and downwardly engage and support the gluteus maximus and biceps femoris of the upper leg of a person seated on the cushion C as will be explained in more detail hereinafter.

The intermediate inclined surface 30 is provided for aligning the femurs F of the person seated on the cushion C so as to maintain the femurs substantially parallel to one another to prevent tilting of the pelvic girdle P. Such surface 30 is more steeply inclined inwardly and downwardly than is the upper surface 24 and extends from such surface 24 to the bottom of the U-shaped depression D.

Below the intermediate surface 30 is a lower inclined surface 40 which is slightly inclined inwardly and downwardly toward the hump H from the forward corner 27 and which forms the bottom of the U-shaped depression D for also receiving and supporting the upper thighs of a person seated thereon. A narrow inclined surface or neck 28 is shown connecting the forward end 26 of the upper surface 24 with the lower surface 40 in a smooth and unbroken sweep and which is disposed in front of the intermediate surface 30.

The surface 30 which forms the outermost inclined side of the U-shaped depression D extends rearwardly from its foremost end 30a which is adjacent the sweeping neck 27 to its rearmost end 30b which terminates near the base of the rear portion R and the base of the hump H in the bend 22. Near the rear end 30b of the inclined intermediate surface 30 is provided an arch or ridge portion 35 which projects outwardly from the surface 30 and serves as a ledge support for receiving the tuberosity of the ischium 37 of a person seated on the cushion C.

Also as shown in FIGS. 1 and 2, the centrally disposed hump or dome H is positioned centrally between the inclined surfaces 30 with its forward edges 41 resting on the lower inclined surface 40 of the side members T. Such surface 40 is inclined inwardly and downwardly and provides a slightly tilted floor of the U-shaped depression D. The dome H is provided with a pair of obliquely disposed ridges or arches 50 which are disposed on the opposite side of the U-shaped valley or depression D from the arches or ledges 35 and substantially parallel thereto for engaging and supporting the inferior ramus of the ischium 38. The raised portion or dome H is also provided with inclined surfaces 51 which extend from the uppermost portion of the ridge or arch 50 downwardly to the peripheral rear edge portion 52 of the dome which joins the inclined floor or surface 40. The dome H is also provided with a longitudinally extending groove or recess 55 which extends from the front edge 56 to the rear portion 52 and substantially midway between the ridges 50. The flanking surfaces 51 are inclined outwardly and downwardly from the oblique ridges 50 to the floor 40 and are provided for also engaging and supporting the gluteus maximus as well as biceps femoris muscles of the upper legs of a person sitting on the cushion C. Thus, it will be appreciated that the spaced arches or ridges 35 and 50 which are positioned on opposite sides of the curved valley or depression D form a cradle which engages and supports the tuberosity of the ischium 37 and the inferior ramus of the ischium 38, respectively, in such a manner that the lower end of the sacrum S and the coccyx C are positioned above the inclined rear surface of the depression D adjacent the bend 22 so as to receive little

or no compression loading when a person is seated in a substantially upright or erect position on the cushion C. The side surfaces 30 align the femurs F substantially parallel to one another so as to prevent the femurs from bowing which would tend to make the hip bones I tilt up at the front. Also, the side surfaces 30 engage the greater trochanter 31 to transmit forces from rotation or pivotal movement of the femurs to the pelvic girdle to support and stabilize the pelvic girdle and also to impact a lifting force to the pelvic girdle through the upper ends of the femurs.

Also, it will be appreciated that the ridges 35 and 50 receive and cradle the ischium while the ledge 15a receives and supports the iliac spines 18 so as to provide substantially three point support for each of the hip bones I.

In the form of the cushion C which is normally used on hard seats such as the chair A, the support 10 is preferably made of steel or some other rigid material whereas the support 10 is preferably slightly flexible in the form of the cushion C normally used on yieldable seats such as found in automobiles and the like.

Also, the cushion C which is provided for use on conventional automobile seats or other similarly soft and yieldable seating surfaces has the opposed ridges 35 and 50 spaced farther apart and generally has a wider U-shaped depression D than the type cushion used on rigid surfaces to offset the lateral movement of the ridges 35 and 50 toward one another due to slight bending of the cushion C in response to the weight of a person seated thereon when the cushion is on a yieldable surface.

In use, the cushion C of the present invention may be placed on a rigid seat such as a chair A or on a yieldable seat such as a conventional automobile seat and comfortably occupied by a user sitting in an erect position for extended periods of time. When a person is seated on the cushion C, the forward portion of his hip bones I, namely, the tuberosity of the ischium and the inferior ramus 33 are cradled in the U-shaped depression D between the oblique ridges 35 and 50, respectively, and the posterior superior iliac spines 18 are supported on the rear ledge 15a. In this position, the sacrum S and the coccyx C are free of any compressive loading which would tilt or incline the lumbar vertebrae L, and such lumbar vertebrae L are properly aligned for bearing the compressive load of the upper body without placing an undesirable compressive load on the superior and inferior posterior articular processes of such lumbar vertebrae L. Also, the femurs F of the seated person are aligned substantially parallel to avoid any tilting or twisting force on the pelvic girdle P which would tend to displace the three point support provided for the hip bones I as described hereinabove.

The foregoing disclosure and description of the invention are illustrative and explanatory thereof, and various changes in the size, shape, and materials as well as in the details of the illustrated construction, may be made within the scope of the appended claim without departing from the spirit of the invention.

What is claimed is:

1. A contoured seat cushion adapted to be used on a seat for properly supporting the weight of a person seated thereon, including:
 - (a) a cushion having a generally U-shaped depression therein opening toward the forward edge thereof for receiving and supporting the posterior of the upper thighs of a person seated thereon;
 - (b) rear pelvic support means at the rear of said cushion for engaging and supporting the posterior superior iliac spines of the ilium of a person seated on said cushion;
 - (c) means on the rear side of said depression for engaging and supporting the tuberosity of the ischium of a person seated thereon;
 - (d) means on the forward side of said depression for

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- engaging and supporting the inferior ramus of the ischium of a person seated thereon whereby the pelvic girdle of a person seated on said cushion is positioned and aligned so as to support the weight of the upper body on the bodies of the lumbar vertebrae and sacrum and to relieve the superior and inferior posterior articular processes of the spinal vertebrae;
- (e) said means on the forward side of said depression including a central dome portion disposed on the forward side of said U-shaped depression which central dome portion has inclined surfaces thereon forming a pair of oblique ridges;
- (f) said means on the rear side of said depression including a pair of obliquely disposed ridge means;
- (g) said means for engaging and supporting the tuberosity of the ischium includes a pair of longitudinally extending curved ridges positioned on the rear side of said U-shaped depression, and the means for engaging and supporting the inferior ramus of the ischium includes a pair of longitudinally extending ridge means which is disposed substantially parallel to said last named ridges and which is adjacent thereto and on the opposite side of said U-shaped depression therefrom;
- (h) a pair of longitudinally and substantially upright side members on said cushion which is inclined in-

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- wardly and downwardly for engaging the gluteus maximus and biceps femoris of a person seated thereon for positioning the femurs of such person substantially parallel to one another;
- (i) a pair of longitudinally and substantial cushion which is inclined inwardly and downwardly for engaging the gluteus maximum and biceps femoris of a person seated thereon to support the greater trochanter of the femurs so as to transmit forces from the femurs to the pelvic girdle; and
- (j) said rear pelvic support member including a front edge facing toward and forward edge of said cushion, said front edge being inclined inwardly and downwardly for supporting the iliac spines.

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