

TITLE: CYCLE SEATField of the Invention

This invention relates to cycle seats. In particular, it is directed to a cycle seat which provides a higher degree of rider comfort while accommodating various styles of riding.

Background Art

The function of a cycle seat is to support the mass of the rider while facilitating pedalling of the cycle. 10 Conventional cycle seats generally comprise a narrow front portion known as the pommel which, when in use, is positioned between, and in contact with, the inner thighs of the rider. The function of the pommel is to restrain lateral movement of the rider's pelvis during pedalling 15 which minimises grinding of the skin against the surface of the seat. Such cycle seats broaden into a rear portion which is adapted to contact the rider's buttocks. The rear portion may only be slightly broader than the front portion, as in "racing" seats, or may be 20 substantially broader, as in the more "traditional" seats.

Since the rear portion of a racing seat is normally only slightly broader than the pommel, the ischial tuberosities of the hip, which take most of a person's 25 body mass when sitting, are not adequately supported. Accordingly, if the rider adopts an "upright position" wherein the upper torso of a rider is substantially upright when pedalling, most of the rider's mass is supported by the coccyx of the rider. As a consequence, 30 a large pressure is applied to the tissues between the coccyx and seat which may in turn cause discomfort and bruising.



On the other hand, if the upper torso of the rider is angled substantially forward during pedalling, as for example when the rider adopts a "racing position", the pelvis of the rider also rotates forward which raises the coccyx above the level of the seat. With such a riding style, most of the rider's mass is supported substantially by the pommel. Consequently, most of this mass is borne principally by the pubic bones which places considerable pressure on the perineal and genital areas of the rider in contact with the pommel. This pressure can produce discomfort and bruising and, in severe cases, even numbness and disfunction of the genitals.

Extra skeletal support is provided by employing more traditional seats wherein the rear portion of the seat is substantially broader than the pommel. In comparison to the racing seat, the broad rear portion of a traditional seat provides support for the ischial tuberosities of the rider which allows the rider's mass to be distributed over a larger area of tissue.

The maximum benefit of this extra support is afforded only if a rider employs an upright position when pedalling because most of the rider's mass would be borne primarily by the ischial tuberosities of the rider. However, if the rider employs a riding style wherein the upper torso is forwardly inclined, the distribution of the rider's mass on the skeletal system changes whereby most of this mass is borne by the pubic bones as well as the ischial tuberosities. This change in skeletal distribution of the rider's mass results in considerable pressure being applied to the perineal and genital areas in contact with the pommel.

Furthermore, with traditional seats, the transitional section between the rear portion and the pommel is also broader which impedes the rider's legs from pedalling in



a substantially vertical axis. There is therefore a tendency for the rider to abrade the legs during pedalling. This type of movement of the lower limbs is unnatural and inefficient mechanically which may cause undue pressure on, and possibly injury to, the rider's lower torso.

The problem with prior attempts at improving the structural design of the cycle seat is that, while recognising that in order to maximise the comfort of the seat it is desirable to uniformly distribute the mass of the rider over a large surface area, such seats do not provide the rider with a degree of comfort which is needed and desired while being adaptable to different styles of riding.

Many attempts have been made in the past to improve the structural design of the cycle seat by making various changes to the size and shape of conventional seats and also to include various types of pads or springs. For example, reference may be made to International Patent Application No. PCT/GB94/01927 which discloses a cycle seat of generally circular shape and comprising an upper seating surface having an upwardly inclined pommel which is substantially wider than conventional pommels, a pair of thigh support surfaces disposed on either side of the pommel and a broad rear support surface. This rear support surface, in use, supports the ischial tuberosities of a rider and in comparison to traditional seats, provides a broader surface for supporting the buttocks of the rider. In addition, the thigh support surfaces either side of the pommel, in use, provide support for the upper thighs. Accordingly, if the rider adopts an upright position when pedalling, there is a large supportive area provided which, in use, distributes the mass of the rider over a larger tissue area compared to conventional seats.



However, if the rider adopts a racing position with this seat wherein the pelvis is angled forward during pedalling, most of the rider's mass would be supported primarily by the upwardly inclined pommel. As a
5 consequence, this mass would be borne principally by the pubic bones which would result in considerable pressure being applied to the perineal and genital areas of the rider.

Due to the generally circular shape of the seat, it is
10 considered that the thigh support surfaces, in use, would hinder the rider's legs from pedalling in a substantially vertical axis and may therefore induce the rider to abrade the legs during pedalling.

Reference also may be made to United States Patent No.
15 4773705 which discloses a cycle seat comprising a pair of concave portions which are inclined downwardly and forwardly. Intermediate the concave portions there is also provided a centre portion extending from the rear to the front of the seat which centre portion comprises a
20 longitudinal concavity towards the front portion thereof where the centre portion is formed with two peripheral ridge-like members having a concavity therebetween. There is also provided a raised peripheral edge portion extending along the sides and rear of the seat.

25 Although this seat provides improvement in accommodating different styles of riding, there are a number of disadvantages. These disadvantages are exemplified by an analysis of the skeletal contacts that a rider makes with the seat when the rider adopts different riding styles.
30 For example, if the rider adopts a riding style wherein the upper torso is substantially upright when pedalling, the rider's ischial tuberosities would be supported by the concave portions of the seat. Consistent with



adopting such a riding style is that the coccyx would be located above the plane of the pair of ischial tuberosities. However, because the depth of the concave portion below the centre portion is not substantial, the 5 coccyx would not be supported adequately by the seat.

In addition, this seat does not provide adequate support if the rider adopts a riding style wherein the upper torso of the rider is angled substantially forward during pedalling. In adopting such a riding style, as with 10 other prior art seats, most of the rider's mass would be largely supported by the pubic bones and the ischial tuberosities. However, since this seat comprises the peripheral ridge-like members at the front of the seat, it appears that a substantial amount of the rider's mass 15 would be largely supported on these members. As a consequence, a considerable pressure would be applied primarily to two small loci in the perineal and/or genital areas in contact with the ridge-like members.

These small loci are adjacent to the perineal arteries 20 and the perineal branches of the spinal nerves. Consequently, if pressure is applied to these loci, there is a strong possibility that this may interfere with arterial blood flow as well as causing severe numbness to the region.

25 Object of the Invention

It is a general object of the present invention to overcome, or at least ameliorate, one or more of the above disadvantages to provide a cycle seat with improved comfort to a rider while accommodating different styles 30 of use by that rider.

Summary of the Invention

According to the present invention, there is provided a cycle seat comprising a central ridge-like member



intermediate of two support surfaces, each of said support surfaces adapted to support respective ischial tuberosities of a rider, said central ridge-like member being adapted to support the coccyx and the pubic bones
5 of said rider when the upper torso of said rider is substantially upright, said central ridge-like member also being capable of supporting said pubic bones when the pelvis of said rider is angled substantially forward.

As used throughout this specification, the term "public
10 bones" refers to the right and left inferior rami of the pubic bones.

Preferably, the lateral dimension of the seat is significantly greater than its longitudinal dimension.

In one embodiment of the present invention, preferably:

15 a dish-like recess is present in each of said two support surfaces; more preferably, each said dish-like recess includes a substantially planar portion; most preferably, each said dish-like recess is positioned towards the front of the seat allowing
20 support of the buttocks of the rider but without interfering with the thighs of the rider during pedalling;

the central ridge-like member is substantially convex in transverse cross section;

25 the central ridge-like member is inclined downwardly towards the front of the seat;

the central ridge-like member is inclined upwardly towards the rear of the seat; more preferably, the central ridge-like member is also inclined outwardly
30 at the rear of the seat;



a raised edge portion extends at or near the periphery of the rear and side of the seat.

In another embodiment of the present invention, preferably:

- 5 each of said two support surfaces is adapted such that a rear boundary thereof, in use, is adjacent the dorsal side of one of the ischial tuberosities of the rider and a front boundary is adjacent the gluteal folds of the rider;
- 10 each of said two support surfaces, in use, is inclined at an angle forwardly and downwardly relative to a ground surface; more preferably, said angle is between 10 degrees and 60 degrees relative to said ground surface;
- 15 is between 20 degrees and 40 degrees relative to said ground surface.
- 20 each of said support surfaces are contoured; more preferably, each of said support surfaces are substantially concave in cross section parallel to the transverse axis of the cycle seat;
- each of said support surfaces are substantially concave in cross section parallel to the longitudinal axis of the cycle seat;
- 25 the front boundary of each of said support surfaces is inclined downwardly;
- the central ridge-like member extends forward of the front of said two support surfaces;



the central ridge-like member is adapted to restrain lateral motion of the rider's pelvis during pedalling;

5 the central ridge-like member, in use, does not interfere with the urogenital region of the rider;

the central ridge-like member, in use, terminates adjacent the perineal region of the rider;

10 the central ridge-like member is of substantially linear, concave or convex longitudinal cross section;

the central ridge-like member is of substantially convex transverse cross section;

a raised upper boundary surface extends along at or near the rear extremity of the seat;

15 a raised upper boundary surface extends along at or near the lateral extremities of the seat;

In the present invention, the lower surface of the cycle seat, in all its embodiments, will usually include a mounting means adapted to releasably mount the seat onto
20 a cycle frame by any convenient means known in the art.

Although not limiting, the cycle seat is preferably formed of a substantially rigid material, for example, a thermoplastic material. Suitable thermoplastic materials include nylon and polypropylene. Of course, the cycle
25 seat may be formed of other materials such as wood, metal and combinations thereof.

The cycle seat may also be provided with a pad or cover means which preferably includes (a) an inner layer formed



of a resilient material such as, for example, polyurethane, (b) a plastics foam or sponge rubber material and (c) an outer protective cover which can be suitably formed of leather or a plastics material such as, for example, polyurethane or polyvinyl chloride.

Brief Description of the Drawings

In order that the invention may be readily understood and put into practical effect, preferred embodiments will now be described with reference to the accompanying drawings 10 in which:

FIG. 1 is a perspective view of one embodiment of the cycle seat in accordance with the present invention showing the upper seating surface of the cycle seat;

15 FIG. 2 is a top plan view of the cycle seat of FIG. 1 showing contour lines of the seat;

FIG. 3 is a transverse cross sectional view of the cycle seat of FIG. 1 showing the position of skeletal bones of a rider when the rider is supported by the seat;

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FIG. 4 is a longitudinal cross sectional view of the cycle seat of FIG. 1 showing the position of skeletal bones of a rider when the rider is supported by the seat;

25 FIG. 5 is a perspective view of an alternative embodiment of the cycle seat in accordance with the present invention showing the upper seating surface of the cycle seat;

FIG. 6 is a perspective view of the cycle seat of FIG. 5 showing the bottom surface of the cycle seat;

30



FIG. 7 is a top plan view of the cycle seat of FIG. 5;

FIG. 8 is a front elevational view of the cycle seat of FIG. 5; and

5 FIG. 9 is a bottom plan view of the cycle seat of FIG. 5.

Specific Examples

Referring now to the drawings and more particularly to FIG. 1, the cycle seat 10 comprises two dish-like 10 recesses 11, 12 each of which has a substantially planar portion 13, 14.

Intermediate the concave portions 11, 12 there is provided a central ridge-like member 15 extending from a rear portion 16 to a front portion 17 of the seat 10. 15 The ridge-like member 15 has a substantially convex transverse cross section comprising a forward section 18 which is inclined forwardly and downwardly. The ridge-like member 15 has a concavity 19 extending parallel to the longitudinal axis of the seat 10 and intermediate the 20 rear and front portions 16, 17 of the seat 10. From the concavity 19, the ridge-like member 15 extends rearwardly and upwardly in an outward manner.

There is also included a raised peripheral edge portion 20 extending along side portions 21, 22 and rear portion 25 16 of the seat 10.

In FIG. 2, there is shown a contour map of the seat of FIG. 1. The dish-like recesses 11 and 12 is use support the ischial tuberosities of a rider generally along the line T-T when the upper torso of the rider is 30 substantially upright and when the upper torso of the



rider is angled substantially forwards during pedalling. The ridge-like member 15 is adapted to support the coccyx of the rider generally along the line C-C when the upper torso of the rider is substantially upright during 5 pedalling.

Referring now to FIGS. 3 and 4, there are illustrated respectively transverse and longitudinal cross sectional views of the cycle seat of FIG. 1 showing the relative positions of the pelvic bones of the rider when the rider 10 adopts an upright position during pedalling.

The raised peripheral edge portion 20 extending along side portions 21, 22 and rear portion 16 of the seat 10 acts to restrain rearward and sideways motion of the pelvis 23 of the rider during pedalling.

15 The planer portions 13, 14 of the respective dish-like recesses 11, 12 in use support the ischial tuberosities 24, 25 of the rider. The dish-like recesses 11, 12 are broad enough to support a substantial portion of the width of the buttocks 26.

20 It should be noted that there is a substantial difference in height between the dish-like recesses 11, 12 and the ridge-like member 15. This height difference is important because it facilitates support for the coccyx 27 of the rider when the upper torso of the rider is 25 substantially upright. The coccyx 27 of the rider is supported at a rearward portion 28 of the ridge-like member 15. Member 15 also acts to restrain sideways movement of the pelvis 23 during pedalling.

In addition, the cross sectional shape of member 15 is 30 complementary to that of the arched region of the pubic bones and is adapted to support the pubic bones 29 when



the upper torso of the rider is substantially upright during pedalling.

Thus, if the rider adopts an upright position when pedalling, there is provided substantially maximum skeletal support spread between the ischial tuberosities 24, 25 the coccyx 27 and the pubic bones 29. This facilitates maximum distribution of the mass of the rider which substantially minimises pressure applied to the tissues in contact with the seat.

10 If the pelvis 23 of the rider is angled forwards during pedalling, as for example in a racing position, the coccyx 27 would be raised above the level of the rearward portion 28 of member 15 and the pubic bones 29 would be rotated forwardly and downwardly pivoting on ischial
15 tuberosities 24, 25. As a consequence, most of the rider's mass is borne by the ischial tuberosities 24, 25 and public bones 29 of the rider. However, since the forward section 18 of member 15 is inclined forwardly and downwardly and has a cross sectional shape complementary
20 to that of the arched region of the pubic bones 29, this minimizes the pressure exerted on the perineal and urogenital areas 30 of the rider in contact with the forward section 18.

The dish-like recesses are recessed at the front portion
25 of the seat which, in use, support the buttocks of the rider but do not interfere with the thighs of the rider during pedalling, thus allowing the legs of the rider to be angled downward to meet the pedals of the cycle with substantially minimal obstruction.

30 Referring now to FIGS 5-9, there is illustrated an alternative embodiment of the cycle seat in accordance with the present invention. The cycle seat generally at 100 comprises a support surface having two substantially



planar lateral portions 101, 102 which, in use, support the ischial tuberosities of a rider.

The lateral portions 101, 102 are substantially concave in cross section parallel to the longitudinal axis of the 5 cycle seat 100 and, in use, are inclined forwardly and downwardly at an angle 20 degrees relative to the ground surface.

Each of the lateral portions 101, 102 extends between a rear boundary 104 and a front boundary 105 thereof. In 10 use, the rear boundary 104 is adjacent the dorsal side of one of the ischial tuberosities of the rider. The front boundary 105, in use, is adjacent the gluteal folds of the rider. This configuration of the lateral portions, in use, supports a portion of rider's gluteal tissue but 15 does not interfere with the thighs of the rider during pedalling. This allows the legs of the rider to be angled downward to meet the pedals of the cycle with substantially minimal obstruction.

A downwardly-inclined upper boundary surface 103 is also 20 provided at the front boundary of each lateral portion 101, 102. In use, this upper boundary surface 103 provides extra support for restraining rearward motion of the rider's pelvis during pedalling.

Intermediate the lateral portions 101, 102, there is 25 provided a central ridge-like member 106 extending from a rear portion 107 to a front portion 108 of the seat 100. The ridge-like member 106 has a slight concavity 109 extending parallel to the longitudinal axis of the seat 100 and has a substantially convex transverse cross 30 section.

The ridge-like member 106 terminates at an anterior boundary 110 thereof which, in use, is adjacent the



perineal region of the rider. The position at which anterior boundary 110 terminates is important because in use, the urogenital region of the rider is not interfered with by the ridge-like member 106. Thus, there is 5 substantially minimal pressure exerted on the urogenital region during pedalling.

It should be noted that there is a substantial difference in height between the lateral portions 101, 102 and the ridge-like member 106. This height difference is 10 important because it facilitates support for the coccyx of the rider when the upper torso of the rider is substantially upright. The coccyx of the rider is supported at a rearward portion 111 of the ridge-like member 106.

15 There is also included a raised upper boundary surface 112 extending along lateral extremities 113, 114 and rear portion 115 of the seat 100. This raised upper boundary surface 112 acts to restrain rearward and sideways motion of the pelvis of the rider during pedalling.

20 The bottom surface 116 of the cycle seat comprises a mounting means 117 adapted to releasably mount the cycle seat 100 on a cycle frame. The mounting means 117 comprises substantially U-shaped rod members 118, 119, which are preferably formed integrally. Each of the rod 25 member 118, 119 extends from a rearward portion 120 to a forward portion 121 of the bottom surface 116 as shown. The rod members 118, 119 are fixed in place by anchoring means 122, 123, 124.

The cycle seat of the present invention is adaptable to 30 various styles of riding while providing substantially minimal pressure on the urogenital area of the rider during pedalling. Furthermore, in use, the lateral portions thereof do not interfere with the thighs of the



rider during pedalling. This allows the legs of the rider to be angled downward to meet the pedals of the cycle with substantially minimal obstruction.

It will be appreciated that the above examples are
5 illustrative only of the present invention and that modifications and alterations can be made thereto without departing from the inventive concept as defined in the following claims.

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Claims

1. A cycle seat comprising a central ridge-like member intermediate of two support surfaces, each of said support surfaces adapted to support respective
5 ischial tuberosities of a rider, said central ridge-like member being adapted to support the coccyx and the pubic bones of said rider when the upper torso of said rider is substantially upright, said central ridge-like member also being capable of supporting
10 said pubic bones when the pelvis of said rider is angled substantially forward.
2. A cycle seat as defined in claim 1, wherein said central ridge-like member is adapted to restrain lateral motion of the pelvis of said rider during
15 pedalling.
3. A cycle seat as defined in claim 1 or claim 2, wherein said central ridge-like member, in use, does not interfere with the urogenital region of said rider.
- 20 4. A cycle seat as defined in any one of claims 1 to 3, wherein said seat allows support of the buttocks of said rider but without interfering with the thighs of said rider during pedalling.
5. A cycle seat as defined in any one of claims 1 to 4,
25 wherein the lateral dimension of said seat is significantly greater than its longitudinal dimension.
6. A cycle seat as defined in any one of claims 1 to 5,
30 such that a rear boundary thereof, in use, is adjacent the dorsal side of one of the ischial





tuberosities of said rider and a front boundary is adjacent the gluteal folds of said rider.

7. A cycle seat as defined in claim 6, wherein each of said two support surfaces, in use, is inclined at an angle forwardly and downwardly relative to a ground surface
8. A cycle seat as defined in claim 7, wherein said angle is between 10 degrees and 60 degrees relative to said ground surface.
9. A cycle seat as defined in claim 8, wherein said angle is between 20 degrees and 40 degrees relative to said ground surface.
10. A cycle seat as defined in any one of claims 6 to 9, wherein each of said support surfaces are contoured.
11. A cycle seat as defined in claim 10, wherein each of said support surfaces are substantially concave in cross section parallel to the transverse axis of said seat.
12. A cycle seat as defined in claim 10 or claim 11, wherein each of said support surfaces are substantially concave in cross section parallel to the longitudinal axis of said seat.
13. A cycle seat as defined in any one of claims 6 to 12, wherein the front boundary of each of said support surfaces is inclined downwardly.
14. A cycle seat as defined in any one of claims 6 to 13, wherein said central ridge-like member extends forward of the front of said two support surfaces.

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15. A cycle seat as defined in any one of claims 6 to 14, wherein said central ridge-like member, in use, terminates adjacent the perineal region of the rider.
- 5 16. A cycle seat as defined in any one of claims 6 to 15, wherein said central ridge-like member is of substantially linear, concave or convex longitudinal cross section.
- 10 17. A cycle seat as defined in claim 16, wherein said central ridge-like member is of substantially convex transverse cross section.
18. A cycle seat as defined in any one of claims 6 to 17, wherein a raised upper boundary surface extends along at or near the rear extremity of said seat.
- 15 19. A cycle seat as defined in any one of claims 6 to 18, wherein a raised upper boundary surface extends along at or near the lateral extremities of said seat.
- 20 20. A cycle seat as defined in any one of claims 1 to 5, wherein a dish-like recess is present in each of said two support surfaces.
21. A cycle seat as defined in claim 20, wherein each said dish-like recess includes a substantially planar portion.
- 25 22. A cycle seat as defined in claim 20 or claim 21, wherein each said dish-like recess is positioned towards the front of said seat allowing support of the buttocks of said rider but without interfering with the thighs of said rider during pedalling.





23. A cycle seat as defined in any one of claims 20 to 22, wherein said central ridge-like member is substantially convex in transverse cross section.
24. A cycle seat as defined in any one of claims 20 to 23, wherein said central ridge-like member is inclined downwardly towards the front of said seat.
25. A cycle seat as defined in any one of claims 20 to 24, wherein said central ridge-like member is inclined upwardly towards the rear of said seat
26. A cycle seat as defined in claim 25, wherein said central ridge-like member is also inclined outwardly at said rear of said seat.
27. A cycle seat as defined in any one of claims 20 to 26, wherein a raised edge portion extends at or near the periphery of the rear and side of said seat.
28. A cycle seat as defined in any one of claims 1 to 27, wherein on a lower surface of said seat there is provided a mounting means adapted to releasably mount said seat onto a cycle frame.
29. A cycle seat as defined in any one of claims 1 to 28 which is formed of a substantially rigid material selected from the group comprising thermoplastic material, wood, metal and combinations thereof.
30. A cycle seat as defined in claim 29, wherein said rigid material is nylon.
31. A cycle seat as defined in any one of claims 1 to 30, wherein a pad or cover means is provided for said seat, said pad or cover means comprising (a) an inner layer formed of a resilient material, (b) a





plastics foam or sponge rubber material and (c) an outer protective cover.

32. A cycle seat as defined in claim 31, wherein said resilient material is polyurethane.
- 5 33. A cycle seat as defined in claim 31 or claim 32, wherein said outer protective cover is formed of leather or a plastics material.
34. A cycle seat as defined in claim 33, wherein said plastics material is polyurethane or polyvinyl chloride.
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