

GAMES TABLE AND PLAYING SURFACE FOR A GAMES TABLE

FIELD OF INVENTION

This invention relates to a games table and a playing surface for a games table and in particular to a games table which has a substantially planar upper surface upon
5 which a ball is propelled and in which some rolling resistance for the ball is desired.

BACKGROUND OF THE INVENTION

Games tables of the type to which the present invention is directed include such types as billiard and snooker tables. Such tables have traditionally been made from a
10 slate base and a covering of felt over the slate with the felt providing rolling resistance for a ball. Generally such games tables have heavy wooden frames to support the slate base and are extremely heavy. There is also little scope for a designer to devise innovative designs.

15 It is the object of this invention to provide a games table and a playing surface for a games table which is more innovative and modern in design and allows for flexibility for a designer. A further object is to provide an alternative playing surface material for an existing games table such as a billiards table.

20 BRIEF DESCRIPTION OF THE INVENTION

In one form the invention is said to reside in a games table comprising a playing surface comprising a solid planar base and a laminate on the planar base to provide the playing surface of the games table, the laminate comprising an envelope of two flexible liquid impervious films and a liquid or gel within the envelope whereby to
25 provide the games table playing surface upon which there is rolling resistance to a ball in use.

Preferably the liquid or gel is selected from the group comprising a water, silicone fluid, mineral oil, vegetable oil, synthetic oil or any other liquid substance that

possesses the characteristics required for this layer. The flexible liquid impervious film may be selected from the group comprising a polyester film, polyurethane film, plasticised PVC film, silicone rubber film or PTFE(Teflon TM) film or any other film material that possesses the characteristics required for this layer.

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The said planar base may be selected from a material selected from the group comprising slate, wood or glass.

10 In a preferred embodiment the solid planar base is glass and is transparent and the flexible film and the liquid or gel are also transparent.

The glass can have a thickness of from 3 to 51 millimetres and preferably from 12 to 18 millimetres, each of the flexible films can have a thickness of from 0.001 to 10 millimetres and preferably from 0.1 to 1 millimetres and the liquid or gel layer can
15 have a thickness of from 0.001 to 10 millimetres and preferably from 0.25 to 1 millimetre.

In an alternative form the invention comprises a games table playing surface formed of a laminate comprising an envelope of two flexible liquid impervious films and a
20 liquid or gel within the envelope whereby to provide a games table surface upon which rolling resistance to a ball is obtained in use.

Preferably the liquid is a silicone fluid having a viscosity in the range of 0.1 to 1,000,000 centistokes and more particularly between 10 to 1000 centistokes.

At least one of the flexible films can have printing, an illustration or advertising thereon.

5 In one embodiment the envelope may comprise a plurality of layers of the flexible liquid impervious film and the liquid or gel in layers between the film layers.

10 There may be further included a border of cloth, fabric or other material with high conformability around the perimeter of the envelope to assist with tensioning and fastening the envelope to a traditional table surface and structure.

15 There may be a plurality of pocket lips on the envelope to ensure a tight fit at the pockets and so that the envelope is tensioned across and along the table.

Alternatively there may be a tensioning system for the pockets which includes a plurality of straps extending from the pocket cut out region of the laminated envelope to a mounting pad such that the straps can be tensioned and folded under the table surface and the mounting pad fastened under the table.

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The lower flexible film of the laminate on the playing surface can comprise a sound and shock absorbing layer comprising a material selected from the group comprising polyethylene, polypropylene, plasticised PVC, polyester, polyurethane, a silicone rubber film or a PTFE(Teflon™) film and having a
25 thickness of from 0.1 mm to 5 mm and preferably from 0.5 to 3 millimetres.

In an alternative form the invention comprises a billiards table having at least four legs, each leg having an upper support pad, a planar glass playing surface supported on the support pads, a plurality of pockets formed around

the periphery of the playing surface, cushions around the periphery of the playing surface, the cushions being fastened to the playing surface, and a laminate on the planar glass playing surface to provide the playing surface of the billiards table, the laminate comprising an envelope of two flexible liquid
5 impervious films and a liquid or gel within the envelope.

There can be further included a hard coating on the upper flexible film. The hard coating on the upper flexible film can be provided so that scuffing of the surface does not occur with balls being propelled across the surface. Such a
10 hard coating may be provided by a sputtered on hard coat layer or silicone-based polish or the like.

There can be further included a sound and shock absorbing layer between the laminate and the planar glass playing surface. The sound and shock absorbing
15 layer can comprise a material selected from the group comprising polyethylene, polypropylene, plasticised PVC, polyester, polyurethane, a silicone rubber or PTFE(Teflon™) and can have a thickness of from 0.1 mm to 20 mm and preferably from 0.5 to 3 millimetres.

20 The sound and shock absorbing layer would have the advantage of:

- Reducing the noise of the ball impacting the glass (or any other surface such as polycarbonate, slate or wood, if fitted to a traditional table) from a height.
- Preventing damage to the glass from a ball being dropped from a height
25 or from the ball landing after someone has taken a 'jump shot'.
- Preventing the ball slowly moving from its stationary position due to the table surface not being perfectly level.

One embodiment of the laminate structure which operates favourably includes:

- Polyester film top layer of optimum thickness range between 0.05mm and 0.5mm of any surface finish and colour/opacity. A scratch resistant coating is applied to the top surface.
 - Middle layer to be a water clear silicone fluid of around between 10 and 1,000 cst. Total thickness of this layer is between .01 and 1mm.
 - Bottom layer of Polyester film, optimum thickness range between 0.05mm and 0.5mm
- The layers can be heat sealed, adhered, double side taped or mechanically fastened together to form a laminate envelope.

A further embodiment of the laminate structure which operates favourably includes:

- Polyurethane film top layer of optimum thickness range between 0.05mm and 1mm of any surface finish and colour/opacity.
- Middle layer to be a water clear silicone fluid of around between 10 and 1,000 cst. Total optimal thickness of this layer is between 0.01 and 0.5mm.
- Bottom layer of Polyurethane film of optimum thickness range between 0.05mm and 1mm of any surface finish and colour/opacity.

The layers can be heat sealed, adhered, double side taped or mechanically fastened together to form a laminate envelope.

A further embodiment of the laminate structure which operates favourably includes:

- A PVC film top layer of optimal thickness range between 0.01mm and 1mm of any surface finish and colour/opacity.
- Middle layer to be a water clear silicone fluid of around between 10 and 1,000 cst. Total optimal thickness of this layer is between .01 and .5mm.

- Bottom layer can be a PVC film of optimal thickness range between 0.01mm and 1mm of any surface finish and colour/opacity.

The layers can be heat sealed, adhered, double side taped or mechanically fastened together to form a laminate envelope.

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A further embodiment of the laminate structure which operates favourably includes:

- Silicone film top layer of optimal thickness range between 0.05mm and 1mm of any surface finish and colour/opacity.
- 10 • Middle layer to be a water clear silicone fluid of around between 10 and 1,000 cst. Total optimal thickness of this layer is between .01 and 0.5mm.
- Bottom layer can be a Silicone film of optimal thickness range between 0.05mm and 1mm of any surface finish and colour/opacity.

The layers can be heat sealed, adhered, double side taped or mechanically fastened together to form a laminate envelope.

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Benefits of a table manufactured according to the present invention over traditional playing surfaces included improved durability, easier maintenance and more consistent game play.

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BRIEF DESCRIPTION OF THE DRAWINGS

This then generally describes the invention but to assist with understanding reference will now be made to accompanying drawings which illustrate preferred embodiments of the invention.

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In the drawings:

Figure 1 shows a perspective view of a billiard table according to one embodiment of the invention;

Figure 2 shows a side view of the billiard table shown in Figure 1;

Figure 3 shows a plan view of the billiard table shown in Figure 1;

Figure 4 shows one embodiment of side cushion according to the present invention;

5 Figures 5A to 5E show detailed views of various embodiments of a laminate structure for the surface of a ball playing table such as a billiards table;

Figure 6 shows a plan view of a laminate of the present invention suitable for use with a games table;

10 Figure 7 shows a detailed view of a laminate construction including a pocket lip assembly according to the invention; and

Figures 8A and 8B show an alternative embodiment of a pocket tensioning system according to the present invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

15 As shown in the drawings and in particular an embodiment shown in Figures 1 to 3, it will be seen that the billiards table 1 comprises four corner legs 3 with each leg having a corner wing 5 which extends to the corners of the table and two side legs 4 with side wings 6 which extend to the centre of the sides. A support pad 7 is provided on the top of each of the legs 3 and 4 and the glass playing surface 9 is supported on the support pads 7. Suitable levelling equipment (not shown) may be provided in the base of each leg to provide a horizontal playing surface for the billiard table. The construction of the playing surface 9 will be discussed in detail with particular reference to Figures 5A to 5E.

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At each corner of the playing surface 9 and in the middle of the sides there are pockets 11. Around the periphery of the table cushion assemblies 13 are provided in the same manner as an existing type of billiards table. The cushion assemblies may comprise an aluminium extrusion and be fastened to

the glass table top 9 as shown in Figure 4. The cushion assemblies could alternatively be injection moulded, plastics extrusions or formed by other methods.

- 5 A net to collect the balls may be provided at each pocket in a conventional manner but according to this particular embodiment of the invention a ball return system is provided.

The ball return system comprises a track 14 along the top of each wing 5 and 6
10 which directs a ball which enters a pocket 11 towards the legs of the table 3 and 4. The ball may alternatively travel through a groove in the wing. Where each wing 5 and 6 is formed from two adjacent plates the ball may travel between the two halves of the wing. Before the ball reaches the leg it is caught and travels along in a ball track 15 which extends along each side of
15 the table under the table top 9 but visible through the glass top 9 from a corner wing 5 to the side wing 6 until the central side wing 6 is reached at which position the ball falls onto a cross tracks 19 and travels across the cross tracks at the end of which the ball falls into a receiving tray 21. Balls which fall through the pockets which are on the same side as the receiving tray 21
20 fall directly from corner wing 5 to the side wing 6 along the longitudinal tracks 15 into the receiving tray.

In a storage area generally shown by the arrow 25 cues, triangles and a folding cover for the billiard table, when not in use, may be stored.
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It will be seen that by this invention there is provided a billiard table of innovative and modern design with a transparent top.

For commercial applications advertising illustrations or the like may be provided on the transparent top or on the flexible film forming the playing surface envelope as will be discussed with respect to Figures 5A to 5E.

5 Figure 4 shows one embodiment of cushion assembly 13. The glass playing surface 9 has the envelope or laminate 27 providing the rolling resistance on it. The envelope or laminate 27 extends under the aluminium extrusion 31 forming the cushion assembly 13 which is mounted onto the glass 9 by means of a bolt 29 which passes through the aluminium extrusion 31 forming the
10 cushion assembly 13 and through the glass 9. The cushion 33 is received in a recess 34 in the cushion extrusion 31.

The envelope or laminate 27 has a peripheral frame 35 and a resilient band 36 extends from the frame 35 to be received under the cushion extrusion and to
15 be clamped there. The resilient band 36 provides resilient tension to the envelope or laminate 27 which will assist with absorbing differential thermal expansion and contraction between the table top 9 and the laminate 27.

Figures 5A to 5E show detailed views of various embodiments of a laminate
20 structure for the surface of a ball playing table such as a billiards table.

Figure 5A shows the detail of the construction of one embodiment of the laminate which forms the playing surface. The glass playing surface 9 has placed on it a laminate in the form of an envelope 27 which comprises a first
25 flexible impervious film 40, on that is a gel layer 42 and over that is another flexible impervious film 44. A hard layer 46 may be provided onto the upper flexible film 44. The hard layer 46 can be provided by a transparent film vacuum deposited onto the film 44 or by a hard polish provided on the upper surface of the film 44.

The envelope 27 around the edge is sealed by heat sealing, double sided tape or adhesive 48 or other means and may be clamped under the cushion to provide a smooth and tight upper surface. The use of a double sided tape
5 with some thickness will provide a thickness for the gel or liquid layer. As discussed earlier the edge of the laminate 27 may alternatively include a frame and a resilient band or hooks to hook around the edge of the table.

In one particular embodiment the flexible films 40 and 44 comprise a 250
10 micron type 515 Dupont Melinex™ film, above and below the liquid silicone. The silicone layer 42 is a water clear silicone with a viscosity rating of 500 centistokes.

A thinner film may not hold its flatness against the liquid silicone as well as a
15 thicker one, so has an uneven appearance after balls have been rolling on it. Anything too thick will not slow the balls down enough as it doesn't conform to the contact patch of the ball to allow the fluid apply rolling resistance to the ball. A range of viscosities between 10 and 1000 cps is preferred. The thinner/runnier silicone works in slowing the ball down but the ball can tend
20 to roll slowly after it has initially come to a stop. Thicker grades of silicone fluid do not slow the ball down from speed as effectively as thinner grades, and tends to not recover the 'dents' made by the balls as quickly.

Figure 5B shows a detailed view of an alternative structure of the laminate
25 structure for the surface of a ball playing table. The laminate envelope 27b comprises a first lower flexible impervious film 40b, on that is a gel layer 42 and over that is an upper flexible impervious film 44. A hard layer 46 may be provided onto the upper flexible film 44. The hard layer 46 can be provided by a transparent film vacuum deposited onto the film 44 or by a hard polish

provided on the upper surface of the film 44. The lower flexible impervious film 40a is formed from a thicker and softer material than the upper flexible impervious film 44. This will assist with providing sound deadening and protection for a table surface from balls being dropped onto it.

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The envelope 27 is sealed around the edge by heat sealing or adhesive 48 or other means and may be clamped under the cushion to provide a smooth and tight upper surface.

10 In one particular embodiment the upper flexible film 44 comprises a 250 micron type 515 Dupont Melinex™ polyester film. The lower flexible film comprises a PVC with a thickness of 1 mm. The silicone layer 42 is a water clear silicone with a viscosity rating of 500 centistokes.

15 Figure 5C shows the detail of the construction of a further embodiment of the laminate which forms the playing surface. The laminate is in the form of an envelope 27c which comprises a first flexible impervious film 40, on that is a gel layer 42 and over that is another flexible impervious film 44. The envelope 27c around the edge is sealed by heat sealing, double sided tape or
20 adhesive 48 or other means and may be clamped under the cushion to provide a smooth and tight upper surface. The use of a double sided tape with some thickness will provide a thickness for the gel or liquid layer.

Below the lower flexible impervious film 40 is a thick and soft film material
25 43. This will assist with providing sound deadening and protection for a table surface from balls being dropped onto it. This sound and shock absorbing layer can comprise a material selected from polyethylene, polypropylene, plasticised PVC, polyester, polyurethane, a silicone rubber film or a PTFE(Teflon™) film and have a thickness of from 0.5 mm to 3 mm.

Figure 5D shows the detail of the construction of a further embodiment of the laminate which forms the playing surface. The laminate is in the form of an envelope 27d which comprises a plurality of flexible impervious films 40d
5 separated by gel layers 42d. In this case there are five film layers 40d and four gel layers 42d. The envelope 27d around the edge 45 is sealed by heat sealing and an eyelet 47 is mounted into the edge 45 to enable fastening of the laminate to a table surface.

10 Figure 5E shows the detail of the construction of a further embodiment of the laminate which forms the playing surface. The laminate is in the form of an envelope 27e which comprises a first flexible impervious film 40e, on that is a gel layer 42e and over that is another flexible impervious film 44e. The envelope 27e is sealed around the edge by heat sealing and joined to the edge
15 is a sheet of cloth 49 or similar material which can be clamped under the cushion to provide a smooth and tight upper surface or for fastening under the edge of a table surface such as by gluing, stapling or other fastening method. The outer fabric strip 49 can be far more conforming to corners/radii than the playing surface layers.

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Figure 6 shows a plan view of a laminate of the present invention suitable for use as a playing surface with a games table and showing two alternative constructions. The laminate 50 suitable for a billiards table has pocket cut-outs 52 at the corners and the middle of the sides. Apertures 58 as shown on
25 the upper and left hand side are provided around the periphery of the laminate 50 to enable the bolts which hold the cushion assembly to pass through. In an alternative, as shown on the lower and right hand sides, a cut out 59 may be provided to enable the bolts which hold the cushion assembly to pass through. In this embodiment the laminate envelope is formed from

two sheets of Mylar TM polyester sheet joined together at the edges 54 by means of a double sided adhesive tape 56. Where the type of material of the film above and below the liquid or gel layer allows, the edges of the films may be heat sealed together to provide the envelope. The laminate may
5 alternatively be of the type discussed in relation to Figures 5A or 5E.

Figure 7 shows a detailed view of a laminate construction including a pocket lip assembly according to the invention. To ensure tight fit at the pockets 60 of the games table 62 at the corners and the middle of the sides there can be
10 used a solid lip 64 which is fastened to the laminate 66 so that when the pocket lip is fitted into the pocket 60 the laminate is tensioned across and along the table. The solid lip can be formed from a transparent material such as polymethyl methacrylate or polycarbonate to match the transparent glass top and laminate envelope of the table top.

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Figures 8A and B show an alternative embodiment of a pocket tensioning system according to the present invention.

Figure 8A shows a portion of the laminated envelope 70 which has a pocket cut-out 72 at a corner. Extending from the pocket cut-out 72 are a plurality of fingers 74 which are fastened to the curve of the edge of the cut-out and extend to a mounting pad 76.
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As shown on Figure 8B the laminated envelope 70 is laid onto the table top 78 so that the pocket cut-out 72 fits the shape of the pocket 80. The fingers 74 are folded under the table in the region of the pocket and the mounting pad 76 fastened to a mounting point 82 under the table surface by any suitable means. The mounting point 82 may be an aluminium disc which can be glued or mechanically fastened etc to the underside of the table top. In one
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embodiment the mounting pad can be clamped between a pair of plates at the mounting point. Alternatively the mounting pad 76 can be fastened directly to the underneath of the table or to any suitable place under the table such as extending back to the table legs underneath the table.

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A gas strut lift system (not shown) may be provided in each leg of the table according to the present invention to allow raising or lowering of the table between a billiard table height and a standard table height. A suitable locking mechanism (not shown) may be provided to remove the load from the struts when it is being used as a billiard table.

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The frame to support the table comprising the legs and wings may be provided in a form which can be assembled so that the playing table according to the present invention can be packed flat for transport.

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It will be seen that by this invention there is provided a laminate surface for a games table and a games table including the laminate surface and in particular a billiards table which is innovative and modern in design but which provides rolling resistance substantially similar to conventional tables by the use of the laminate structure on the playing surface. The laminate structure provides rolling resistance and noise reduction.

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Throughout this specification various indications have been given as to the scope of this invention but the invention is not limited to any one of these but may reside in two or more of these combined together. The examples are given for illustration only and not for limitation.

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Throughout this specification and the claims that follow unless the context requires otherwise, the words 'comprise' and 'include' and variations such as

'comprising' and 'including' will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

CLAIMS

1. A games table comprising a playing surface comprising a solid planar base and a laminate on the planar base to provide the playing surface of the games table, the laminate comprising an envelope of two flexible liquid impervious films and a liquid or gel within the envelope whereby to provide a playing surface upon which there is rolling resistance to a ball in use.
2. A games table as in claim 1 wherein the liquid or gel is selected from the group comprising a water, silicone fluid, mineral oil, vegetable oil.
3. A games table as in claim 1 wherein the flexible liquid impervious films are selected from the group comprising a polyester film, polyurethane film, a plasticised PVC film, a silicone rubber film or a PTFE(Teflon TM) film.
4. A games table as in claim 1 wherein the said planar base is selected from a material selected from the group comprising slate, wood, glass, polycarbonate, polymethyl methacrylate or metal.
5. A games table as in claim 1 wherein the solid planar base is glass, polycarbonate or polymethyl methacrylate and is transparent.
6. A games table as in claim 1 wherein the solid planar base is glass, polycarbonate or polymethyl methacrylate and the flexible film and the liquid or gel are transparent.
7. A games table as in claim 6 wherein the glass has a thickness of from 6 to 51 millimetres, each of the flexible films has a thickness of from 0.001 to 10 millimetres and the liquid or gel layer has a thickness of from 0.001 to 10 millimetres.
8. A games table playing surface formed of a laminate comprising an envelope of two flexible liquid impervious films and a liquid or gel within the envelope

whereby to provide a playing surface upon which there is rolling resistance to a ball in use.

9. A games table playing surface formed of a laminate as in claim 8 wherein the flexible film is selected from the group comprising polyester film, polyurethane film, a plasticised PVC film, a silicone rubber film or a PTFE(Teflon TM) film.

10. A games table playing surface formed of a laminate as in claim 8 wherein the liquid or gel is selected from water, silicone fluid or mineral oil.

11. A games table playing surface formed of a laminate as in claim 8 wherein the liquid is a silicone fluid having a viscosity in the range of 0.1 to 1,000,000 centistokes.

12. A games table playing surface formed of a laminate as in claim 8 wherein at least one of the flexible films has printing, an illustration or advertising thereon.

13. A games table playing surface formed of a laminate as in claim 8 wherein each of the flexible films has a thickness of from 0.001 to 10 millimetres and the liquid or gel layer has a thickness of from 0.25 to 1 millimetre.

14. A games table playing surface formed of a laminate as in claim 8 comprising a plurality of layers of the flexible liquid impervious film and the liquid or gel in layers between the film layers.

15. A games table playing surface formed of a laminate as in claim 8 further including a cloth or fabric edge around the envelope to assist with tensioning and fastening the envelope to a table surface.

16. A games table playing surface formed of a laminate as in claim 8 further including a plurality of pocket lips on the envelope to ensure a tight fit at the pockets and so that the envelope is tensioned across and along the table.

17. A games table playing surface formed of a laminate as in claim 8 including pocket cut-outs and a plurality of straps extending from the pocket cut-outs to a mounting pad such that the laminate can be tensioned in the region of the pockets cut-outs by the straps being tensioned and folded under a table surface mounted thereto.

18. A games table playing surface formed of a laminate as in claim 8 comprising an upper flexible film and a lower flexible film and wherein the lower flexible film of the laminate on the playing surface comprises a sound and shock absorbing layer comprising a material selected from the group comprising polyethylene, polypropylene, plasticised PVC, polyester, polyurethane, a silicone rubber film or a PTFE(Teflon TM) film and having a thickness of from 0.5 mm to 3 mm.

19. A billiards table having at least four legs, each leg having an upper support pad, a planar glass playing surface supported on the support pads, a plurality of pockets formed around the periphery of the playing surface, cushions around the periphery of the playing surface, the cushions being fastened to the playing surface, and a laminate on the planar glass playing surface to provide the playing surface of the billiards table, the laminate comprising an envelope of two flexible liquid impervious films and a liquid or gel within the envelope.

20. A billiard table as in claim 19 further including a hard coating on the upper flexible film.

21. A billiard table as in claim 19 wherein the glass has a thickness of from 3 to 51 millimetres, each of the flexible films has a thickness of from 0.001 to 10 millimetres and the liquid or gel layer has a thickness of from 0.01 to 10 millimetres.

22. A billiard table as claimed in claim 19 comprising an upper flexible film and a lower flexible film and wherein the lower flexible film of the laminate on the playing surface comprises a sound and shock absorbing layer.

23. A billiard table as claimed in claim 22 wherein the sound and shock absorbing layer comprises a material selected from the group comprising polyethylene, polypropylene, plasticised PVC, polyester, polyurethane, a silicone rubber film or a PTFE(Teflon TM) film.
24. A billiard table as claimed in claim 22 wherein the sound and shock absorbing layer has a thickness of from 0.5 mm to 3 mm.
25. A billiard table as claimed in claim 19 further including a sound and shock absorbing layer between the laminate and the planar glass playing surface.
26. A billiard table as claimed in claim 25 wherein the sound and shock absorbing layer comprises a material selected from the group comprising polyethylene, polypropylene, plasticised PVC, polyester, polyurethane, a silicone rubber or PTFE(Teflon TM).
27. A billiard table as claimed in claim 26 wherein the sound and shock absorbing layer has a thickness of from 0.1 mm to 20 mm.