Oct. 8, 1940. H. H. KUHLMAN 2,216,818

PNEUMATIC SEAT

Filed Nov. 21, 1938

Fig. 1

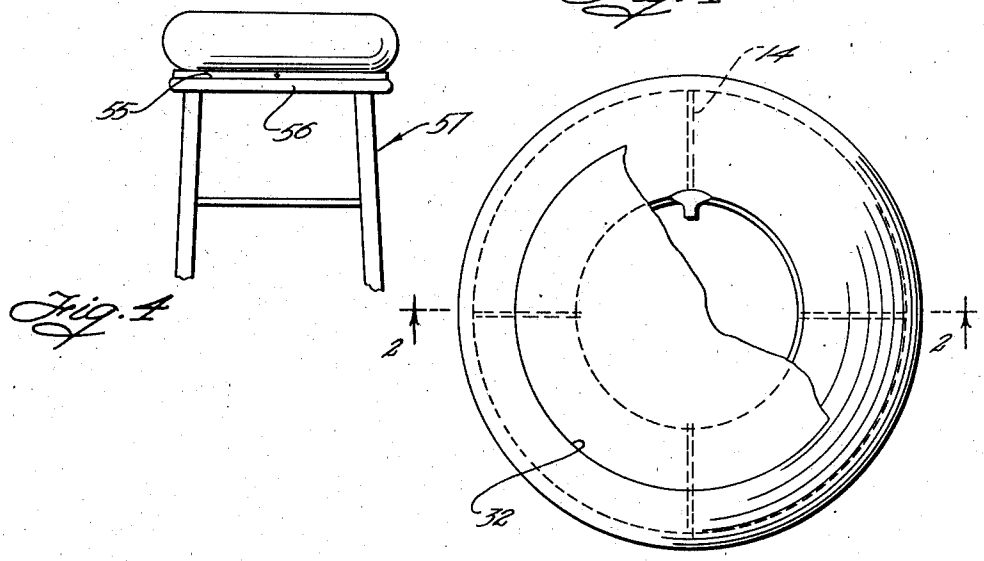


Fig. 4

Fig. 2

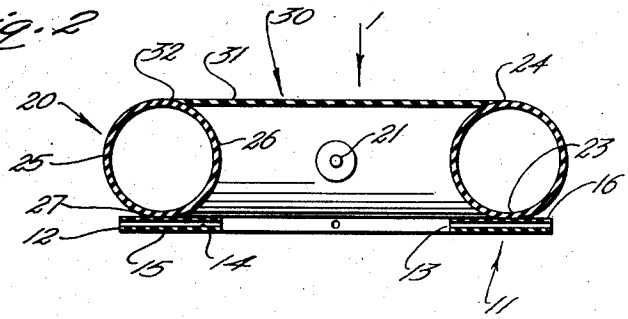
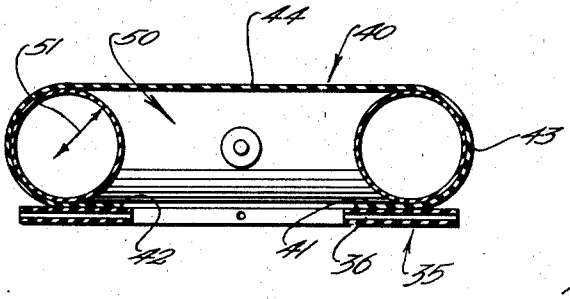


Fig. 3



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PNEUMATIC SEAT

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6 Claims. (Cl. 155—179)

My invention relates to a pneumatic seat or portable cushion employing an annular rubber tube as the main basis of the seat or cushion, this being incorporated with a cover material forming the main supporting portion of the seat, the rubber tubes being designed for the resiliency.

An object and feature of my invention is in the construction of an assembled or a readily assembled seat formed of an annular pneumatic tube secured to a ring-like base having a cover material filling the center opening through the tube. By this construction the strong and substantial annular ring rests on the rigid structure such as a stool, the present seat of various power implements which subject the driver or operator to excessive vibration.

In one form of my invention the flat ring which is preferably made of rubber with fabric reinforcement has a series of radial openings for through passage of air, this being for the purpose of allowing expulsion of air from the opening through the center portion of the tube when the cushion is placed on a level support which might otherwise prevent the to and fro circulation of air. As a further characteristic the rubber pneumatic tube is vulcanized or similarly secured to the ring so that when it is expanded the rubber tube has its lower portion securely attached to the ring, therefore the seat fabric together with the rubber tube and the ring forms an air space in addition to that of the tube. The supporting fabric is preferably made of rubberized cloth or similar material and is likewise vulcanized or otherwise secured to the upper portion of the tube, thus when the tube is fully inflated without weight being placed on the fabric seat, such seat practically forms a tangent with the circles at any radial position of the tube.

In another form of my construction the rubber tube is readily removable from the assembly and in this case I provide the ring to rest on the base, the cover or seat material is attached such as by vulcanizing to the ring. The expandible rubber tube is then fitted in the pocket formed by the fabric and stretches this to form a horizontal fabric seat at the top. In this construction likewise I employ the air vents through the rubber ring, these being preferably radial, the ring being of sufficient thickness to accommodate these air passages. In this second construction the fabric of the seat is tangential to the pneumatic ring at the top and also the bottom portion is also preferably tangential, the circular edge of the seat fabric being secured to the ring contiguous to the inner edge of such ring. This seat fabric is likewise preferably of rubberized cloth or similar material.

My invention is illustrated in connection with the accompanying drawing, in which:

Fig. 1 is a plan partly broken away taken in the direction of the arrow 1 of Fig. 2 of one form of my invention in which the annular pneumatic tube is secured to a flat ring at the bottom and the web forming the seat is attached to the upper portion of the tube.

Fig. 2 is a diametrical section taken on the line 2—2 of Fig. 1 in the direction of the arrows.

Fig. 3 is a diametrical section through an alternative form in which the pneumatic tube fits in pockets formed by a continuation of the web forming the seat.

Fig. 4 is an elevation of a stool or other support on which the cushion may be placed.

Referring to the characteristics of the construction of Figs. 1 and 2, I employ a flat ring 11 which is preferably made of rubberized fabric or other suitable and similar material. This may be comparatively thin as to its vertical measurements. In the illustration the peripheral edge 12 is circular and the inner edge 13 is also circular. It is obvious however that these may be of different shapes as desired and need not in all cases be concentric. Formed in the flat ring there are a series of air flow ducts 14, these being preferably molded in the material in the construction of the ring. They are illustrated as being radially located and the number used depends on the particular use and construction of the cushion. In the illustration the cushion is characterized by having a flat bottom surface 15 and also parallel and flat top surfaces 16.

The pneumatic tube 20 is illustrated as an annular tube and when inflated substantially circular being provided with a valve 21 for inflation. The tube may be considered as having a bottom portion 23, a top portion 24, an outer surface 25 and an inner surface 26, there being thus a circular opening in the inner surface. The lower portion 23 of the tube is secured permanently to the flat ring 11 and to the upper surface of such ring. This gives an annular attachment area indicated at 27. The flat ring is therefore substantially tangential to the circle formed in any radial cross section of the pneumatic tube. The seat or seat web 30 employs stretched seat material 31 which is preferably fabric with a sufficient rubber coating or impregnation to make a strong seat material and to provide sufficient rubber so that the peripheral edge 32 of the seat may be vulcanized to the upper portion 24 of the pneumatic

tube. When inflated the line of attachment may be tangential to any radial cross section of the pneumatic tube, however it is obvious that the seat material may extend outwardly beyond the tangential line. This construction thus permanently attaches the three main elements, that is, the flat ring, the pneumatic tube and the seat fabric together form a unitary structure.

In the construction of Fig. 3 I employ a flat ring designated 35 which may have the same structure and characteristics as the flat ring 11 of Fig. 2, this having preferably parallel lower and upper surfaces and a series of air ducts 36 arranged radially. In this case a cover seat material designated 40 has a lower portion indicated at 41 secured to the upper surface of the ring 35 by vulcanizing or the like. This lower portion is indicated as having a circular opening 42 illustrated as spaced slightly outwardly from the central opening through the ring 35. This material has an outwardly bulging portion 43 and a seat portion 44 which may be designated as a seat web.

The pneumatic tube 50 is of the ordinary character and is illustrated as circular in any radial cross section indicated at 51. This may have any suitable type of inflation valve. In fact, the tube itself may be of the same construction as used in Figs. 1 and 2, however the characteristic of the construction of Fig. 3 is that the tube is entirely separate and unattached to the seat forming fabric or the flat ring 35. It may be fitted in the pocket formed by the fabric by insertion through the central opening of the flat ring 35 and likewise removed in the same manner. When the pneumatic tube is inflated the internal air pressure causes the expansion of the tube, the filling of the pocket and the stretching of the seat web 44, this then engaging the upper portion of the pneumatic tube on a tangential line. The lower portion of the tube also engages the inwardly extending portion 41 on a tangent at any radial section.

The characteristics of the cushion or seat are such that the flat ring either of Figs. 1 and 2 or Fig. 3 may rest on the flat upper surface indicated at 55 of the top 56 of the stool 57 or any suitable support. If the surface 55 is flat, then were it not for the air vents 13 and 36, the air would be apt to be trapped below the seat web when a person sits on the cushion, however as the pneumatic tube is compressed the air trapped in the central opening of the pneumatic tube may be pressed outwardly through the air ducts. Likewise when the pressure is released and the cushion assumes its normal contour and shape, air enters through these ducts.

Various changes may be made in the details of the construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A pneumatic cushion comprising in combination a flat annular ring forming a base and having radial air ducts, an annular pneumatic tube positioned above the upper surface of the base, a seat fabric forming a web extending between the top portions of the pneumatic tube in substantially a tangent to any radial section of the tube, the tube spacing the seat fabric from the base.

2. A pneumatic cushion as claimed in claim 1, the lower edge of the tube having a vulcanized connection to the upper surface of the base and the seat fabric having a vulcanized connection at its peripheral edge to the upper portion of the tube whereby the base is substantially in a plane tangent to the cross section of the tube taken on radial sections.

3. A pneumatic cushion as claimed in claim 1, the seat fabric having an annular bulged portion and an inwardly turned lower portion fitting against the upper surface of the base and vulcanized thereto, there being a circular opening in the lower portion at least equal in size to the opening of the ring forming the base, the bulging portion forming an annular pocket for the pneumatic tube and a seat portion of the seat fabric being stretched between the upper portion of the tube and the annular pocket, the tube being insertable and removable through the opening formed by the ring of the base and the circular opening of the lower portion of the seat fabric.

4. A pneumatic cushion including in combination an annular base provided with air duct openings leading towards the center, an annular pneumatic tube positioned on the upper side of the base, a seat fabric engaging the upper portion of the annular tube and being spaced by such tube from the base, the seat fabric being provided with a marginal bulging portion and a lower inturned portion with a circular opening, such lower portion having a permanent attachment to the base whereby the seat fabric and the bulging portion forms an annular pocket retaining the pneumatic tube in the desired position and shape, the seat fabric having a seat portion stretching between the top portions of the pneumatic tube.

5. A pneumatic cushion including in combination an annular base having a bottom surface to rest on the cushion support and form therewith a substantially air tight seal, the base having air duct openings leading towards the center, an annular pneumatic tube positioned on the upper side of the base, a seat fabric engaging the upper portion of the annular tube and being spaced by such tube from the base.

6. A pneumatic cushion including in combination an annular base having a bottom surface to rest on the cushion support and form therewith a substantially air tight seal, the base having air duct openings leading towards the center an annular pneumatic tube positioned on the upper side of the base, a seat fabric engaging the upper portion of the annular tube and being spaced by such tube from the base, the lower portion of the tube having an attachment to the upper surface of the base, the seat fabric at its marginal edge having an attachment to the upper portion of the tube whereby the base, the tube and the seat fabric form a unit.

HENRY H. KUHLMAN.