

[54] SEAT CUSHION

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[58] Field of Search 297/DIG. 3, 284; 5/348,
5/349

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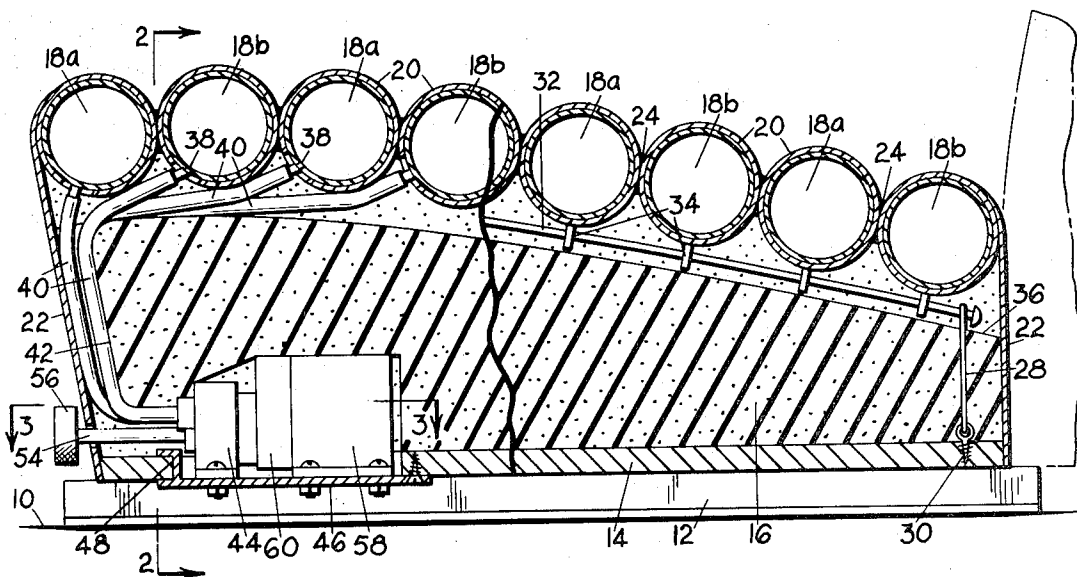
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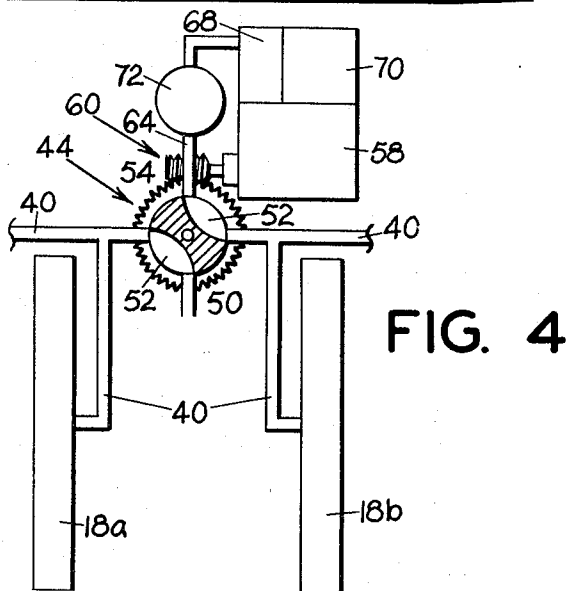
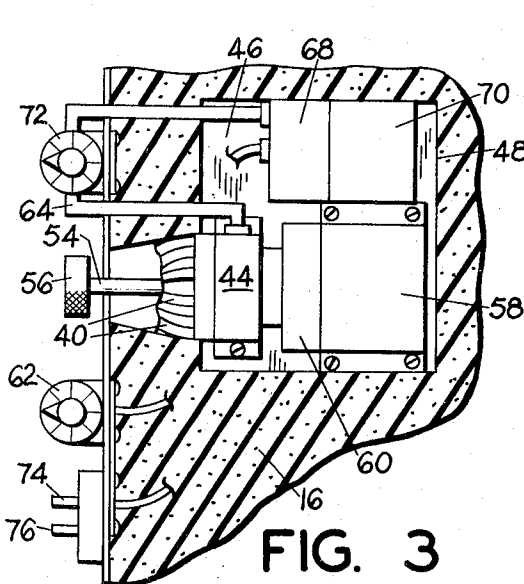
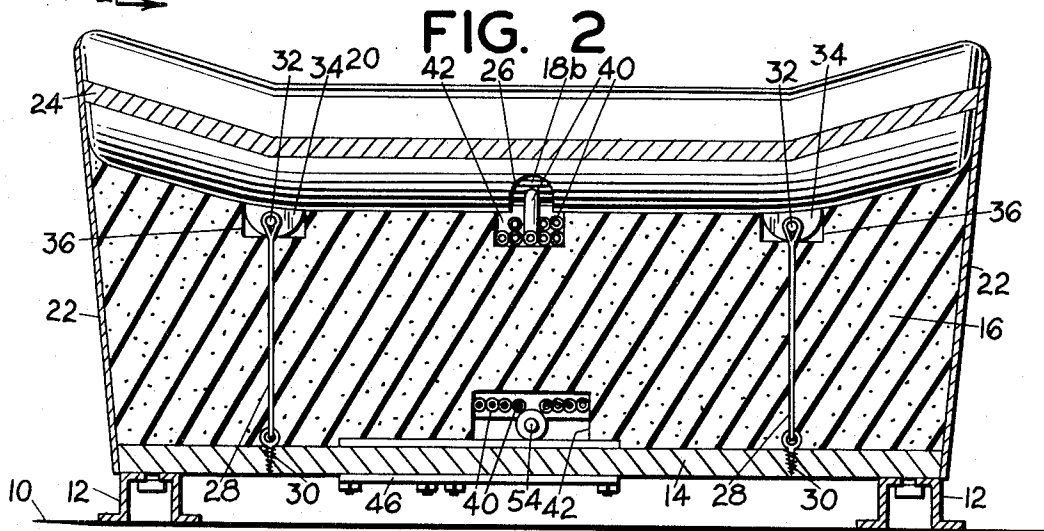
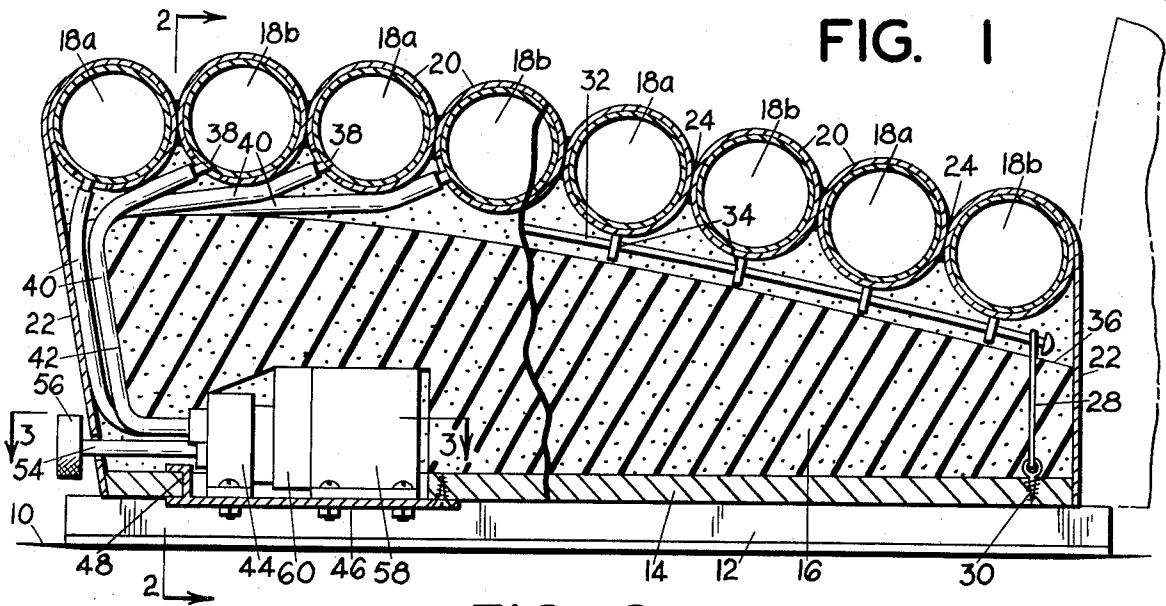
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[57] ABSTRACT

A cushion having a foam rubber body on which is supported a plurality of inflatable tubes in transverse side-by-side relation. The tubes are connected to an air supply adapted to inflate the tubes. Control means are associated with the air supply in an arrangement which causes inflation of alternate tubes while deflating the remaining tubes and vice versa, thus varying the points of support for a person using the seat. The controls are arranged to be either hand operated for manual cycling of air to the two sets of tubes or power operated for automatic cycling.

1 Claim, 4 Drawing Figures





SEAT CUSHION

BACKGROUND OF THE INVENTION

This invention relates to new and useful improvements in inflatable cushions.

As is well known, it is tiring for a person to remain seated for a substantial length of time. Not only is there considerable discomfort but also the circulation in the lower part of the body will generally be impaired. This is not only uncomfortable but it is also unhealthy. Substantially all truck drivers who operate on long hauls or otherwise do not have the opportunity to leave the truck once in awhile are subjected to this discomfort. The same discomfort of course also exists for those persons who likewise cannot get up and move around such as persons in a wheelchair or in hospital beds.

Cushions have heretofore been provided which are inflatable, such as shown in U.S. Pat. Nos. 3,540,776, 2,938,570, 3,652,126, and 3,363,941. This latter patent even goes so far as to provide an inflatable seat having air tubes which are disposed in side by side relation and which are capable of selected inflation. These inflatable cushions of course are more comfortable than hard seats but they still have the disadvantage that they impair the circulation in the person's lower extremities. Their main purpose is either to provide a cushion of selected resilience by air inflation or to contour the cushion by air. Thus, once the seats are made to the desired resilience by the air means or are selectively contoured they do not have hardly any advantage over other types of resilient seats such as foam rubber.

SUMMARY OF THE INVENTION

According to the present invention and forming a primary objective thereof, a cushion is provided which includes means for inflating and deflating alternately disposed air tubes so that the position of support for a person engaged with the cushion can be changed to increase seating comfort and also to prevent the impairment of circulation.

More particular objects of the invention are to provide a cushion of the type described which employs a plurality of inflatable air tubes arranged in first and second sets with tubes in the first and second sets being alternately disposed and associated with air supply and control means such that the first set of tubes is arranged to be inflated while the second set of tubes is being deflated and vice versa, thus varying the points of support for a person engageable with the cushion; and to provide in such control means manual or power driven automatic cycling means whereby the operator can either manually or automatically cycle the inflation and deflation of these sets.

The invention will be better understood and additional objects and advantages will become apparent from the following description taken in connection with the accompanying drawings which illustrate a preferred form of the device.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal sectional view of the present cushion, such view being broken away at the rearward portion thereof to show details of structure;

FIG. 2 is a transverse vertical sectional view of the cushion taken on the line 2—2 of FIG. 1;

FIG. 3 is a horizontal sectional view taken on the line 3—3 of FIG. 1 and showing air supply and control means for the cushion; and

FIG. 4 is a diagrammatic view of the air system and control means therefor.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

With particular reference to the drawings the present cushion structure could have particular usage as a vehicle seat, such as a truck seat, but it is to be understood that it could as well serve as a seat for other means, such as for a wheelchair. Furthermore, the cushion described may either be a seat cushion or a backrest cushion, although its primary function is to serve as a seat cushion.

The numeral 10 designates a support for the cushion which may comprise the floor of a truck, the base of a chair, or the like. The support 10 supports a pair of tracks 12 on which the seat may be adjustable in a well known manner.

The present seat comprises a rigid base plate 14, such as a piece of plywood, and this base supports a foam rubber body 16 in a well known manner.

According to the present invention and with reference to FIGS. 1 and 2, a plurality of laterally extending air tubes are supported on the foam rubber 16. For purposes of illustration, the odd tubes are numbered 18a and the even tubes are numbered 18b. These tubes are contained in pockets or compartments 20 formed in the upholstery 22 of the seat. In the arrangement shown, the upholstery along the top of the cushion is formed in said pockets 20 with abutting or adjacent portions of the pockets secured together at 24 such as by stitching. With particular reference to FIG. 2, the pockets have a center, bottom cut-out portion 26 by means of which the tubes are initially installed for assembly.

The tubes preferably are held down against the foam rubber 16 in a transversely contoured shape of the seat, as seen in FIG. 2, by pairs of front and rear vertical anchor lines 28 extending between anchor screws 30 on the base 14 and longitudinally extending rods 32 passing through tabs 34 depending integrally from the bottom side of pockets 20. Rods 32 extend through longitudinal grooves 36 provided in the upper surface of the foam rubber 16.

Each of the tubes 18a and 18b has an air inlet stem 38 which projects through the cut-out portions 26 in the upholstery and is connected to hoses or conduits 40 which all extend through a groove 42 provided in the upper surface of the foam rubber 16 as well in the front of the latter and partially back along the bottom.

These hoses extend into a valve 44 secured on a plate 46 which is removably secured in an opening 48 in the base 14. As seen in the diagrammatic view of FIG. 4, the valve 44 has an inner core 50 with a pair of opposite cut-out portions 52 and 54. This core is rotatable and has a forwardly extending stem 54 projecting out through the front of the seat and terminating in a hand operating knob 56 for easy access and operation by the operator. The other end of the core 50 is connected to a motor 58 through a gear reduction 60, thus providing powered rotation of the core. Motor 58 preferably is electrically driven and is in the circuit of a rheostat 62 which is operative to control the speed thereof.

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Leading into the core of the valve 50 is an inlet 64 from a compressor 68 driven by a motor 70 such as an electric motor. The illustration of a compressor and drive motor therefor is purely diagrammatic in the drawings and is intended for illustration purposes only, since it is to be understood that compressed air may be supplied from another source such as the compressed air system of a vehicle. Also, a larger compressor than that shown may be necessary. As illustrated, this compressor is mounted on the plate 46 as is its drive motor 70. An adjustable pressure regulator 72 is incorporated in the inlet conduit 64 and serves to regulate the amount of pressure allowed to the valve, which as will be apparent is used to determine the amount of inflation of the air tubes 18a and 18b. On/off switches 74 and 76 are provided to control the operation of motors 58 and 70, respectively.

With particular reference to FIG. 4, it is a feature of the present invention to connect the hoses from alternate air tubes 18 to opposite sides of the valve. That is, the hoses 40 from the air tubes 18a are connected to one side of the valve and the hoses 40 from the air tubes 18b are connected to the other side of the valve. FIG. 4 shows only one each of air tubes 18a and 18b but it illustrates that tubes 40 lead to still other tubes in the respective sets.

The valve core 50 is arranged in its cut-out portions 52 and 54 such that in one position thereof one set of air tubes, for example the tubes 18a, will be in communication with the compressor and the other set of air tubes 18b will be vented to atmosphere. In the other or 90° rotated position of the valve, the inflated set of air tubes 18a will be allowed to deflate and the tubes 18b will be inflated. Thus, in a manual operation, the operator need only rotate the stem 54 to change condition of the two sets. Or, if he desires, he may place the motor 58 in operation and the device will automatically cycle to alternately inflate and deflate the two sets. The cycling speed on automatic cycle is pre-set by the rheostat and of course the hardness of the cushion is pre-set by pressure regulator 72.

Thus, according to the present invention, adjacent air tubes 18a and 18b are alternately inflated and deflated. This can be done manually or automatically depending upon the desires of the operator. As the device cycles, the supporting points for the operator on the cushion alternate which of course provides a support which does not impair circulation. Such a system also has

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other advantages one of which is that it minimizes drowsiness. The device may be readily installed in existing vehicles, such as in trucks, by substituting the present seat for those now existing or, too, it can as well be installed on chair seats such as wheel chair seats.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention, or the scope of the subjoined claims. For example, the system could use liquid instead of air in a well known manner.

Having thus described my invention, I claim:

1. A seat cushion comprising
 - a. a flexible support member,
 - b. an upholstery cover for said flexible support member having an upper surface,
 - c. means in said upholstery cover defining a plurality of transverse individual parallel pockets extending from side to side of the seat cushion,
 - d. each of said pockets having a bottom opening disposed approximately centrally between the two sides,
 - e. a first set of fillable flexible tubes supported on said flexible support member and being confined within alternate one of said pockets,
 - f. a second set of fillable flexible tubes supported on said flexible support member and confined in pockets alternately spaced between said first pockets,
 - g. said tubes having inlet connections substantially centrally thereof for projection from said openings in the pockets,
 - h. continuous powered fluid supply means having hoses secured to said inlet connections and being arranged to feed and discharge fluid in said tubes,
 - i. a center groove in the front and upper surface of said flexible support member receiving said hoses, the upper surface of said upholstery assuming the contour of the upper portion of the individual tubes,
 - j. and cycle control means for said fluid supply means arranged to admit fluid to said first set of tubes while discharging fluid to atmosphere from the second set of tubes and vice versa whereby to vary points of support for a person seated on the seat.

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