July 25, 1967 G. R. JOHNSON, JR., ET AL 3,332,656

TURNTABLE

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FIG. 1

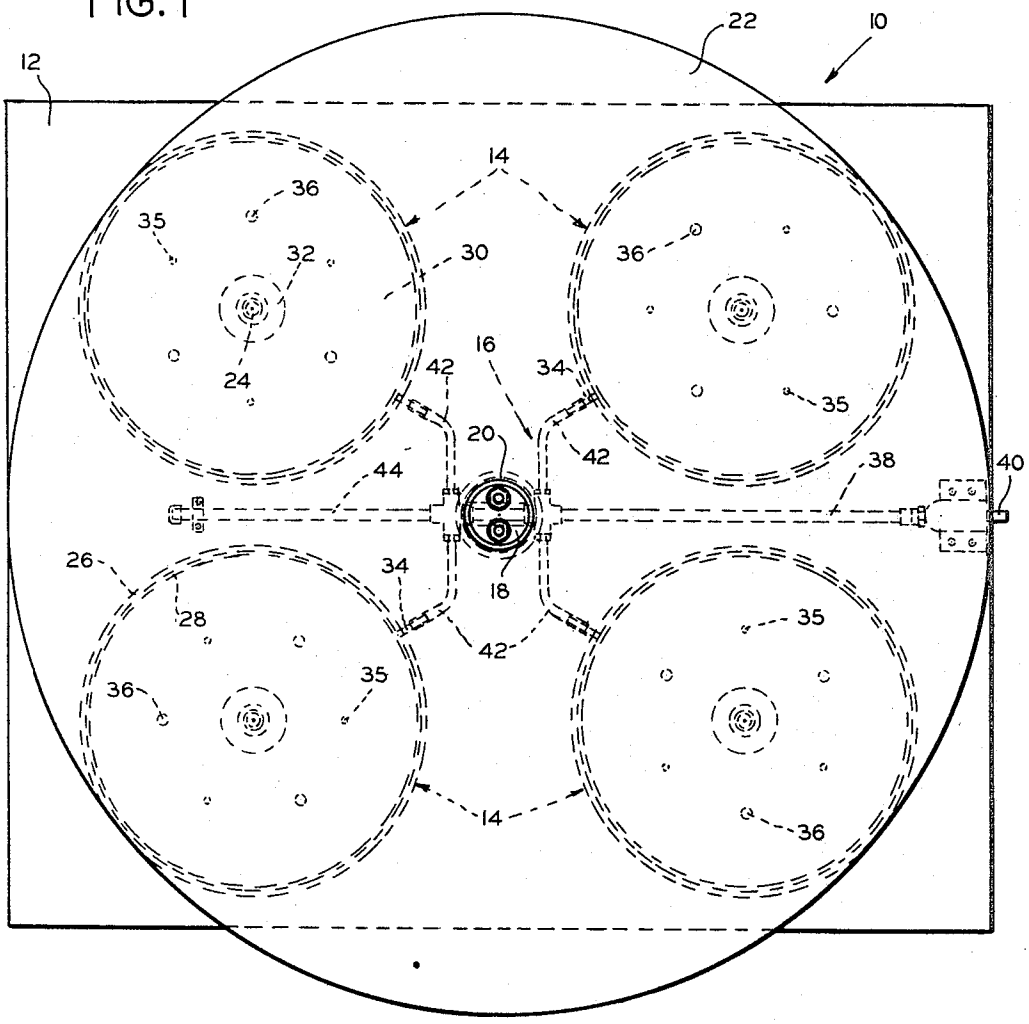
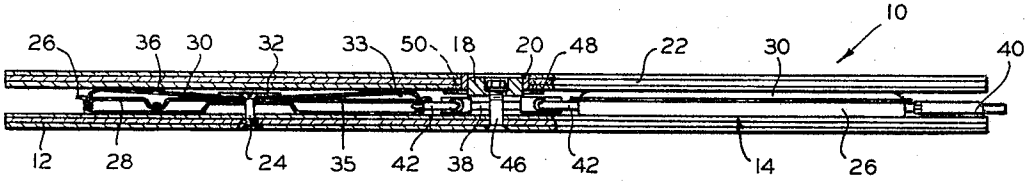


FIG. 2



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FIG. 3

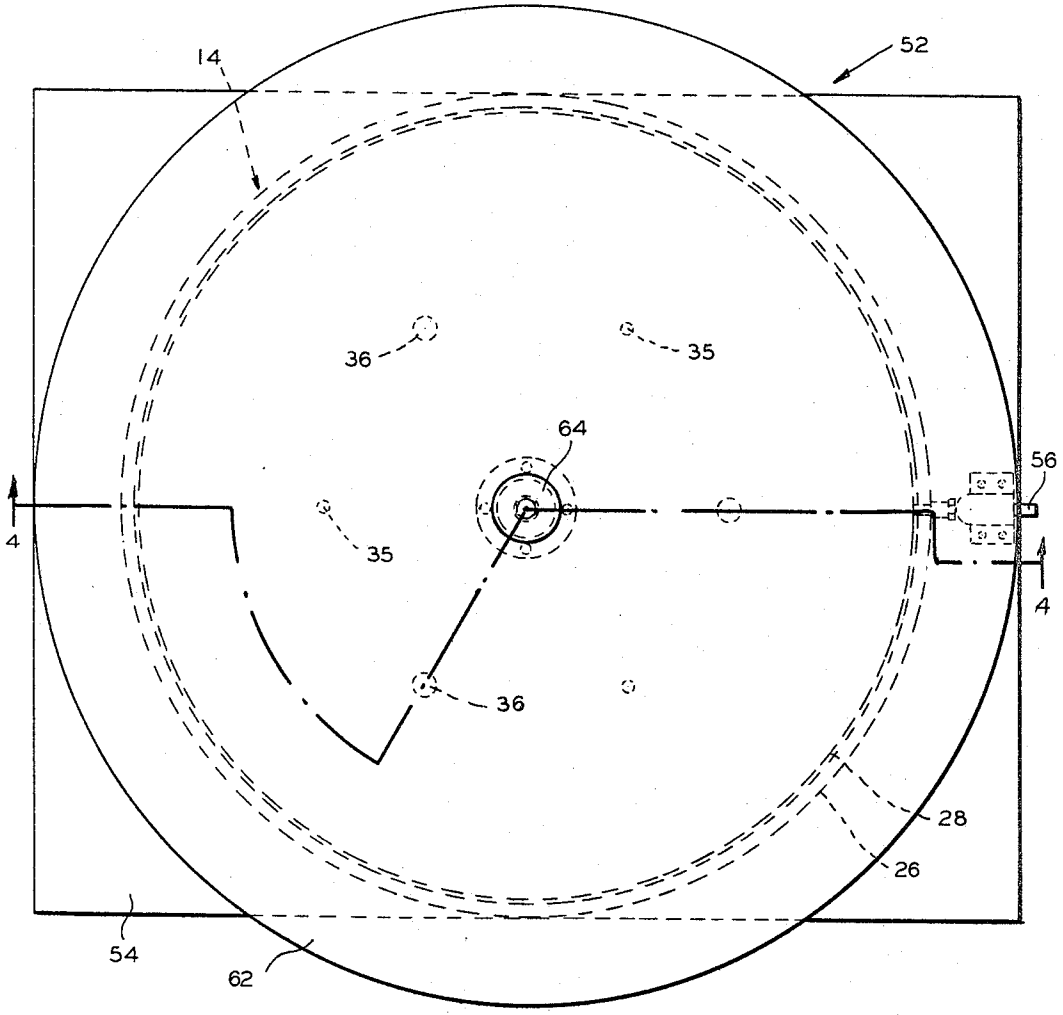
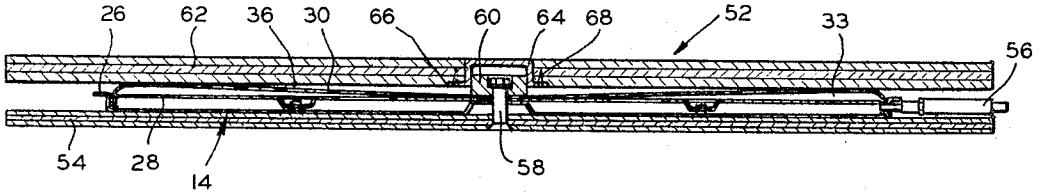


FIG. 4



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TURNTABLE

3,332,656

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Filed Oct. 23, 1965, Ser. No. 503,087
5 Claims. (Cl. 248—349)

This invention relates to a turntable, and more specifically to a turntable having a load supporting platform which rotates on an air film.

Conventional turntables that are capable of handling loads in the 4,000 pound range tend to be bulky and heavy as well as expensive to manufacture.

A principal object of our invention is to provide a turntable that is inexpensive to manufacture.

Another object of our invention is to provide a turntable that is lightweight, has a low silhoutte and may be easily relocated.

Another object of our invention is to provide an improved turntable.

In carying out our invention in a preferred embodiment thereof we provide a base on which four inflatable air pads are mounted. Pressurized air is supplied to the various pads by means of a fluid distribution system. Located centrally of the pads is an upstading trunnion which is attached to the base. A rotatabe member or platform overlies the pads and includes a circular bushing located centrally thereof which engages the trunnion so that the rotatable member may rotate around the trunnion and slide along the trunnion to allow for inflation and deflation of the pads.

In carrying out a second embodiment of our invention we provide a base upon which a single inflatable air pad is mounted. A trunnion is located centrally of the air pad and connected to the air pad and base. A rotatable member overlies the air pad and includes a circular bushing which engages the trunnion so that the rotatable member may rotate about the trunnion or move along the trunnion to allow for inflation and deflation of the air pad.

The above and other objects, features and advantages of our invention will be more readily understood by persons skilled in the art when the following detailed description is taken in conjunction with the accompanying drawing wherein:

FIGURE 1 is a plan view of a preferred embodiment of our invention,

FIGURE 2 is a partial cross section and partial elevational view of the turntable shown in FIG. 1,

FIGURE 3 is a plan view of another embodiment of our invention, and

FIGURE 4 is a cross section taken along line 4—4 of FIG. 3.

Referring now to FIGS. 1 and 2, reference numeral 10 denotes generally a turntable which includes a base 12, a plurality of inflatable air or fluid pads 14 supplied with pressuribed air or fluid by a fluid distribution system 16, a trunnion 18 which engages a circular bearing or bushing 20 and a rotatable member or platform 22 which overlies air pads 14.

Pads 14 are grouped generally symmetrically in a pattern on base 12. Each pad includes an outer frame member 26 which is generally dish-shaped and an inner frame member 28. Frame members 26 and 28 cooperate to hold the outer periphery of a generally circular piece of flexible sheet 30 therebetween. Each pad 14 is connected to base 12 by means of a bolt 24 which extends through the pad centrally thereof and threadably engages base 12. In addition, bolt 24 serves to hold members 26 and 28, sheet 30 and a disk 32 together centrally thereof.

Sheet 30 forms with outer frame member 26 an air chamber 33 which when supplied with pressurized air through an inlet 34 causes sheet 30 to inflate. Also, sheet 30 is provided with a plurality of openings 36 therein through which pressurized air escapes from air chamber 33 and flows radially outwardly therefrom between sheet 30 and platform 22. Frame member 28 also is provided with a plurality of openings 35 which communicate the portions of chamber 33 located on opposite sides of frame member 28.

Pressurized air is supplied to pads 14 by means of fluid distribution system 16 which includes a main conduit 38 which has an inlet 40 adjacent one edge of base 12. Inlet 40 preferably is one-half of a quick disconnect coupling so that system 16 may be readily connected to an air line. Running from main conduit 38 is a plurality of feeder conduits 42 which connect, respectively, with the inlets 34 of the various air pads 14. Also connected to main conduit 38 is an air chamber 44 which serves to provide an air cushion that minimizes any vibration or oscillation between air pads 14 and platform 22. For a more complete description and explanation of a fluid distribution system suitable for use with this turntable see copending application, Serial No. 503,175, filed on the same date as this application in the name of V. K. Swamy and assigned to the same assignee as the present application.

Trunnion or pivot pin 18 is located centrally of pads 14 and straddes a portion of conduit 38. Trunnion 18 is connected to base 12 by a pair of bolts 46 which threadably engage base 12 and extends upwardly from base 12 substantially perpendicular to base 12.

Rotatable member 22 serves as a load supporting platform and preferably is generally circular, although it could be some other shape such as rectangular, for example. Attached to platform 22 centrally thereof is cylindrical bearing 20 which has a flange 48 through which a plurality of screws 50 pass to attach it to member 22. Bearing 20 engages trunnion 18 when platform 22 is disposed in overlying relation to air pads 14. Trunnion 18 and bearing 20 cooperate to permit rotation of bearing 20 around trunnion 18 as well as axial sliding movement of bearing 20 relative to trunnion 18. As a result platform 22 can rotate around the longitudinal axis of trunnion 18 and can move axially relative to trunnion 18.

In order to enable persons skilled in the art to better understand our invention we will now explain the operation of the above-disclosed embodiment. It will be assumed that a load which it is desired to rotate is placed upon rotatable member 22. At this point member 22 will be resting on disks 32. Now, by suppling pressurized air to inlet 40 the pressurized air will be distributed to the various pads 14, causing them to inflate and thereby elevate member 22 from ¾ to ⅞ of an inch, depending upon the load to the position shown in FIG. 2. Also, air will be escaping from pads 14 through openings 36 and passing radially outwardly therefrom to form an air film between pads 14 and member 12. As a result the coefficient of friction between pads 14 and member 22 is greatly reduced, whereby member 22 and the load thereon may be rotated easily about the axis of trunnion 18. Further, it should be noted that member 22 can rise slightly due to the inflation of pads 14 since bushing 20 can slide axially of trunnion 18.

Referring now to FIGS. 3 and 4, there is shown a turntable 52 which is a second embodiment of our invention. Turntable 52 includes a base 54 upon which a single inflatable air or fluid pad 14 is mounted. Pad 14 is substantially identical to the pads 14 of the previously described turntable 10, and so reference is made hereto to the above description relating to the pad 14, like reference numerals

being used for like parts. Pressurized air or fluid is supplied to air chamber 33 of pad 14 through an inlet 56 which preferably is one-half of a quick disconnect coupling. Pad 14 is held together and connected to base 54 by means of a nut and bolt assembly 58. Nut and bolt assembly 58 also attaches a trunnion or pivot pin 60 to pad 14 and base 54 centrally of pad 14, as shown.

Overlying pad 14 and base 54 is a rotatable member 62 which serves as a load supporting platform. Member 62 includes a cup-shaped cylindrical bushing or bearing 64 located centrally thereof. Bushing 64 is fixed to rotatable member 62 by means of a flange 66 and a plurality of screws 68 which pass through flange 66 and threadably engage member 62. Bushing 64 is adapted to engage trunnion 60 for rotational movement therearound and sliding movement axially thereof.

Turning now to the operation of turntable 52, it will be assumed that a load is disposed upon platform 62 and that pressurized air is not yet supplied to pad 14. At this point the underside of rotatable member 62 may rest upon the edge of outer frame member 26 or upon any other suitable projection, such as a block member secured to base 54 or to member 62. Now, if it is desired to rotate member 62, pressurized air is supplied to air pad 14 through inlet 56 with the result that sheet 30 inflates causing member 62 to be elevated from ¾ to ⅞ of an inch, depending upon the load, to the position shown in FIG. 4. At this stage air will be escaping through openings 36 and passing radially outwardly between sheet 30 and the underside of member 62 with the result that an air film is formed between sheet 30 and member 62. This air film greatly reduces the coefficient of friction therebetween member 62 and sheet 30 with the result that member 62 may be rotated very easily about trunnion 60.

The above detailed description of our invention is intended to be illustrative only, and should not be construed in any sense as limiting. Various modifications, changes and substitutions may occur to persons skilled in the art which fall within the scope and spirit of our invention, and so the limits of our invention should be determined from the following appended claims.

We claim:

1. A turntable comprising a base, at least one inflatable fluid pad mounted on the said base, a trunnion connected to the said base, a rotatable member overlying the said pad and engaging the said trunnion for rotational movement therearound and a sliding movement therealong.

2. A turntable comprising an inflatable fluid pad, a pivot pin connected to the said pad centrally thereof, a rotatable member overlying the said pad and engaging the said pin for rotational movement therearound and sliding movement therealong.

3. A turntable comprising a base, a plurality of inflatable air pads mounted on the said base, a trunnion connected to the said base, and a rotatable member overlying the said pads, the said rotatable member including a cylindrical bearing which engages the said trunnion for rotational movement therearound and sliding movement therealong.

4. A turntable comprising a base, a single inflatable air pad, a trunnion located centrally of the said pad, means connecting the said base, pad and trunnion together, a load supporting platform overlying the said pad, and an inverted cup-shaped bushing connected to the said platform substantially centrally thereof and engaging the said trunnion for rotational and sliding movement so that when the said pad is inflated the said platform is elevated and then is rotatable about the said trunnion on an air film.

5. A turntable comprising a base, a plurality of inflatable air pads mounted on the said base in a generally uniform pattern, air distribution means for supplying pressurized air to the said pads, a trunnion connected to the said base substantially centrally of the said pattern, a load supporting platform overlying the said pads, and a bearing connected to the said platform, the said bearing engaging the said trunnion for rotational and sliding movement so that when the said pads are inflated the said platform is elevated and then is rotatable about the said trunnion on an air film.

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