Jan. 14, 1930. L. H. VERVOORT 1,743,255

ROLLER CONSTRUCTION

Filed March 23, 1927

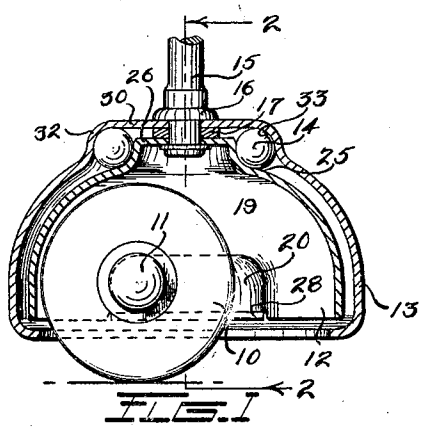


FIG. 1

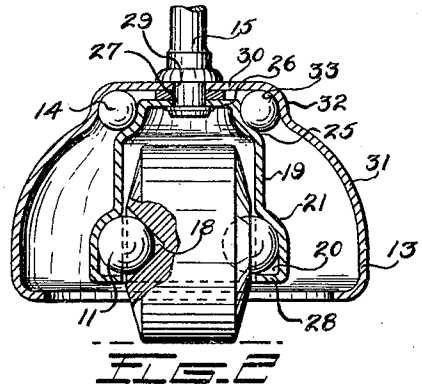


FIG. 2

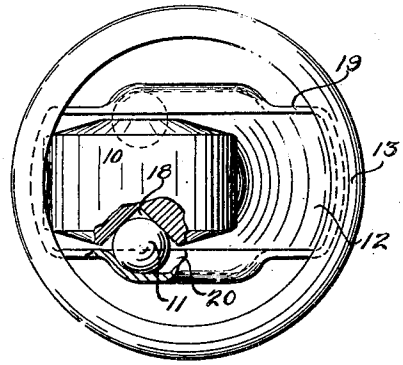


FIG. 3

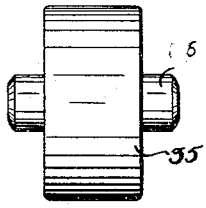


FIG. 4

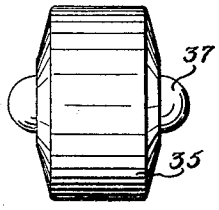


FIG. 5

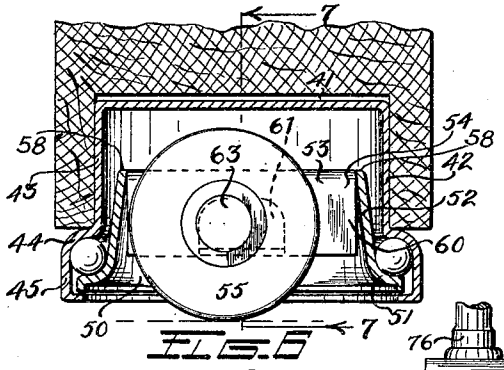


FIG. 6

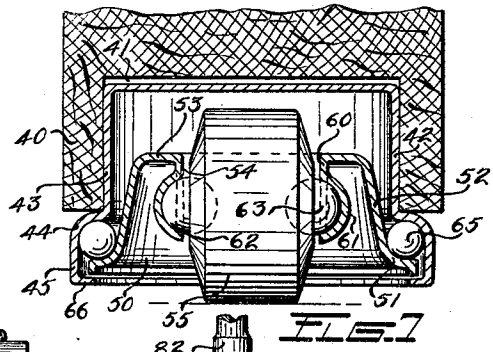


FIG. 7

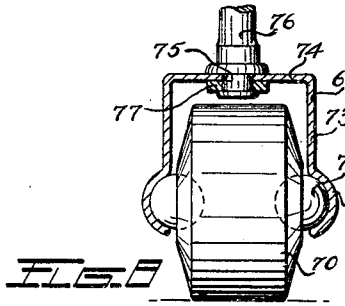


FIG. 8

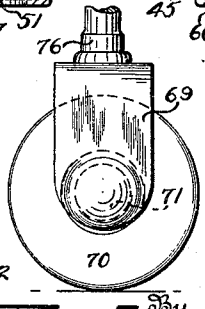


FIG. 9

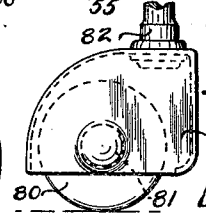


FIG. 10

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UNITED STATES PATENT OFFICE

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ROLLER CONSTRUCTION

Application filed March 23, 1927. Serial No. 177,801.

This invention relates to an improvement in roller construction and more particularly to a roller construction used to support articles of furniture or the like.

Heretofore it has been impossible to combine in a roller construction a smooth free action of the roller and strength as well. The difficulty seems to lie in the fact that the average roller, while freely rotatable with very little weight applied to it would not do so with any load placed upon it but would tend to bind in its housing and not function properly.

The principal object of this invention is to provide a roller construction which will operate smoothly and freely in any and all directions.

Another object of this invention is to provide a supporting means for said roller which will permit free rotatable action in any direction even when a considerable load is applied to the supporting means.

A further object of this invention is to provide a device of this class which is simple to construct, easy to assemble and which is adapted to be used with furniture in a concealed or partially concealed manner.

Other objects of this invention will appear from the following specifications taken in connection with the drawings which form a part thereof and in which:

Figure 1 is a sectional view of a roller bearing construction embodying one form of this invention particularly such as applied to an article of furniture;

Figure 2 is a sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a bottom plan view of the construction shown in Figure 1;

Figures 4 and 5 are modifications of the roller shown in Figure 1 and illustrate different axial supports, the supports herein shown being integral with the roller;

Figure 6 is a sectional view of another modification of the roller construction showing the manner in which the device may be partially concealed in an article of furniture;

Figure 7 is a sectional view taken on the line 7—7 of Figure 6;

Figure 8 is a front view of a simplified form of roller construction;

Figure 9 is a side elevation of the construction shown in Figure 8;

Figure 10 is a modification of the construction shown in Figure 8, and shows a device in which the roller is offset from the vertical center of its supporting housing.

Referring to the drawing and particularly to Figure 1, this invention comprises a roller 10, bearings 11 supporting the roller, bearing support or housing 12, a shell 13 encasing the housing 12, bearings 14 supporting the shell 13 upon the housing 12, and a shaft 15 secured to the shell 13 and housing 12. The roller 10 has an annular depression 18 in each side thereof and into which bearings 11 are inserted, being freely rotatable therein. The housing 12 is elongated to permit the roller 10 free movement therein as is clearly shown in Figures 1 and 3. The walls 19 of the housing 12 are pressed out to form pockets 20. These pockets have curved shoulders 21 against which the bearings 11 are positioned when the device is ready for use. Above the shoulder 21 the wall 19 continues upwardly to a point where it is curved inwardly to form an annular shoulder 25 and is then curved substantially at right angles to itself to form a flat upper face 26. Located in the center of the face 26 is an annular opening 27 the purpose of which will later be described. The shell 13 is substantially bell shaped with the exception that at its upper portion it is flattened to form a face 30, said face having an annular opening 29 therein, the opening 29 corresponding in size and position in the shell 13 to the opening 27 in the housing 12. The portion 31 of the shell 13 which forms the wall thereof is curved upwardly at 32 and

then inwardly to form the face 30. The face 30 and the vertical portion 32 form a shoulder 33 which shoulder corresponds in shape to the shoulder 25 of the housing 12. When the shell 13 and the housing 12 are in assembled position the shoulder 33 and the shoulder 25 form a race in which bearings 14 are free to rotate. The bearings 14, the number of which is not limited may each be free to function within the race formed by shoulders 25 and 33 or may be secured in a retaining ring and work together within said race. When the bearings 14 are in position against the shoulder 25 the outer and upper face of said bearings will rest against the race 33 provided therefor in shell 13. The shaft 15 has a shoulder 16 integral therewith which abuts the face 30 of the shell 13. Below the annular shoulder 16 the shaft 15 continues downwardly through the opening 29 in the face 30 of the shell 13 and a nut 17 secures the shell 13 to the shaft 15. The shaft 15 extends beyond the nut 17 sufficiently to pass through the opening 27 in the housing 12 and with a washer in place against the under side of the face 26 of the housing 12, the end of the shaft 15 is headed over to secure the housing 12 to the shaft 15. The shell 13 is securely fastened to the shaft 15 by the nut 17, thereby preventing any independent movement of either the shaft or the shell. The housing 12, however is loosely secured to the shaft 15 in order that it may freely revolve upon said shaft with any change in direction of roller 10.

In assembling this device it is necessary to secure the shaft 15 to the shell 13 by means of the nut 17. The bearing 14 either in a retaining ring or as shown in the drawing as free ball bearings are then inserted within the shell 13 against the shoulder 33. The housing 12 is inserted within the shell 13 being properly positioned with relation thereto by the end of the shaft 15 fitting into the opening 27 in the face 26 of the housing. The washer is then placed on the shaft and as before stated the end of the shaft is headed over to secure the housing 12 within the shell 13. The roller 10 with the bearings 11 in place in the recesses 18 are now inserted within the housing 12, the position of the bearings and the roller being determined by the pockets 20. After the bearings 11 and roller 10 have been inserted within the housing 12 the lower edge of the walls 19 are bent inwardly to form flanges 28. These flanges retain the bearings 11 and roller 10 in proper position within the housing 12 but do not prevent the roller and bearings from moving in a horizontal direction throughout the length of the pocket 20.

The rollers shown in Figures 4 and 5 differ slightly from roller 10 in that the axial support is integral with the roller. In Figure 4 the roller 35 is integral with its supporting means 36 which is in the nature of a stub-axle. In Figure 5 the roller 35 is integral with its axle but in this instance the support 37 is similarly shaped to that portion of the bearing 11 which projects out from the wall of the roller. It may be seen that the roller 35 with either axle support 36 or 37 may be used in the construction shown in Figure 1 and would eliminate the necessity of the combined use of the roller 10 and bearings 11, either of the portions 36 or 37 corresponding to and taking the place of the bearings 11 and functioning in the same way within the pockets 20.

Figures 6 and 7 show a modification of the construction shown in Figure 1 in that the device in this instance is nearly embedded within the article of furniture to which it is attached. Referring to Figure 7, an article of furniture 40 is cut away on its under face to form a pocket 41 into which the shell 42 of the device is inserted. The shell is closed at its upper end and has a vertical wall 43 extending downwardly for a distance of about two-thirds of the height of said shell. The wall 43 is bent outwardly and again downwardly thereby forming a curved shoulder 44, said shoulder terminating in a vertical wall 45 which in reality is a continuation of the wall 43 but moved outwardly the width of shoulder 44. Within the shell 42 is located the bearing and roller support 50. This support is formed in the shape of a curved shoulder 51 at its lower periphery. The wall 52 of the support continues upwardly from the shoulder 51 in a substantially vertical direction into the shell 42 and is curved inwardly substantially at right angles thereto at 53. The flange 53 forms an upper face to the support 50, the center portion of which is cut and bent downwardly to form flanges 54 within the walls 52. The flanges 54 extend only throughout opposite parallel sides and are sufficiently separated to allow the roller 55 to extend therethrough. The two remaining walls 58 are completely cut away thereby creating a space or opening in which the roller 55 may travel horizontally on its axis. The face 53 of the wall and the cut away walls 58 are clearly shown in Figure 6. The flanges 54 have vertical walls 60 which terminate in curved walls 61, said walls forming pockets 62, which are substantially the same size and shape and which are used for the same purpose as the pockets 20 previously described and shown in Figure 1. The roller 55 is identical in construction with the roller 10 and has recesses in its vertical walls which recesses support bearings 63. The outer portions of the bearings 63 rest within the pockets 62.

In assembling this device the shell 42 is inserted in the opening 41 in the piece of furniture 40. The roller 55 and the bearings 63 having previously been pressed into po-

sition within the support 50, said support is now ready to be inserted within the shell 42. A number of bearings 65 secured in a retaining ring or as shown in the drawing in a loose state are inserted within the shell 42 and against the shoulder 44. The support 50 is now inserted within said shell to a point where the curved portion 51 of the wall 52 abuts the bearings 65. The lower wall 45 of the shell 42 is bent inwardly to form a flange 66 which flange retains support 50 and bearings 65 in position within the shell 42.

Figures 8 and 9 illustrate a simplified application of this invention, and show a roller 70, bearing 71, partially imbedded in the side walls of the roller and held in place by the cup shaped portion 72 of the vertical walls 73 which form a part of the support 69. The walls 73 terminate in a closed face 74 which face has an opening 75 therein. A shaft 76 similar to the shaft 15, shown in Figure 1 is inserted within the opening 75 and is secured to the face 74 by a nut 77. In order to keep the nut from loosening once it is tightened, the extreme end of the shaft 76 is headed over and securely locks the nut 77 in position.

Figure 10 shows a slight modification of the construction shown in Figures 8 and 9. In this modification the roller 80 and its bearings 81 are offset from the vertical center of the supporting shaft 82 in order that a swivel or swinging action of the roller may be obtained when an article of furniture, to which the device is attached is moved in one direction or another. The support 83 differs from the support 69 only in that it has end walls which extend downwardly and almost completely conceal the roller from view. This innovation of concealing the roller is of considerable advantage since it helps to preclude dust and dirt particles from getting into the bearing surface and stopping the free action of the roller.

It will be noted in the two modifications shown in Figures 1, 2 and 3 and Figures 6 and 7 that the shell which encloses the device has within it a bearing or race surface which rests upon a shoulder of the roller support through bearings located therebetween. This construction has a decided advantage over other types of rollers used for this purpose in that the weight of the article of furniture is applied in the most direct manner to the roller. This device was constructed with the idea in mind of creating a roller which when used with an article of furniture, regardless of the size and weight of said article would freely rotate or move in any direction.

It is apparent that while only a few modifications of this device have been shown and described, applicant does not intend to be limited thereto since it is quite obvious that anyone skilled in this art and being presented with applicant's invention could through his skill suggest other adaptations of this device which are within the spirit and scope of this invention as set forth in the following claims.

Having set forth my invention, what I claim as new and for which I desire protection by Letters Patent is:

1. A roller construction comprising a roller having recesses in the sides thereof; a supporting housing having horizontal and parallel, elongated pockets therein, bearings seated within said pockets; and engaging said recesses; an annular groove formed in said housing; a vertical shaft, a dome-shaped shell secured to said shaft, and bearings within said shell, said bearings being seated in the said groove in said housing; said housing being rotatably secured to said shaft.

2. A roller construction comprising a roller having recesses in the sides thereof; a support enclosing said roller; bearings engaging the walls of said support and the said recesses, an annular groove in said support, a shell encasing said support, bearings and roller and means for rotatably securing said shell relative to said roller support.

3. A roller construction comprising a roller having recesses in the sides thereof, a hollow roller support having elongated pockets on its inner surface and in parallelism, bearing balls riding in said pockets and engaging said recesses, a dome-shaped shell enclosing said support, and means permitting relative rotation of the support and shell, for mounting the said roller construction upon the body to be carried.

4. A roller construction comprising a roller, a hollow roller support having an open end and a dome-shaped shell mounted upon said support and relatively rotatable therewith, means for pivoting the roller within and upon the walls of the support, and means for mounting the support and shell upon the body to be carried.

5. A roller construction comprising a roller, a roller support encasing said roller, bearings for pivoting the roller within and upon the walls of the support, a dome-shaped shell adapted to be fixedly secured to the body to be carried, means for rotatably securing said support within and slightly spaced from said shell, and means on the inner surface of said support for engaging the said bearings and permitting transverse movement of the roller in said support.

6. A roller construction comprising a roller, a hollow roller support enclosing the roller, the inner surface of the support including parallel grooves forming pockets for bearings, ball bearings positioned in said pockets and in corresponding recesses in the sides of the roller, and a dome-shaped shell mounted for rotation relative to said support and about the same.

7. A roller construction comprising a roller having recesses in the sides thereof; a support enclosing said roller; bearings engaging the walls of said support and the said recesses, there being an annular groove in said support, a shell encasing said support, bearings and roller, said shell having an annular internal groove which with the groove in said support forms a race; and bearing balls movably secured in said race whereby said shell engages and rests upon said support.

In testimony whereof I have affixed my signature.

LAMBERT H. VERVOORT.