J. F. WOLFS.

CASTER.

APPLICATION FILED OCT. 11, 1921.

1,421,647.

Patented July 4, 1922.

2 SHEETS—SHEET 1.

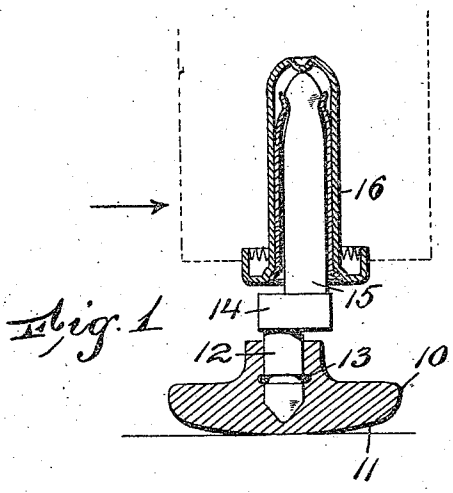


Fig. 1

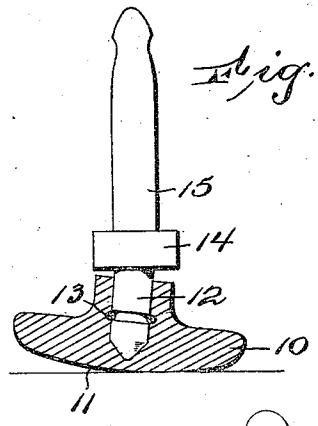


Fig. 2

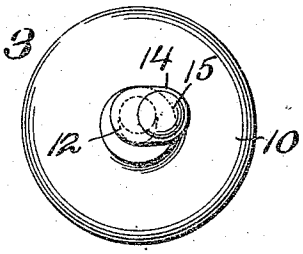


Fig. 3

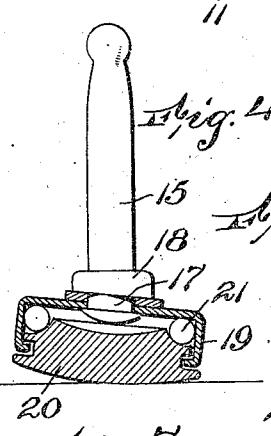


Fig. 4

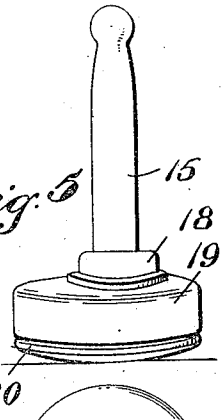


Fig. 5

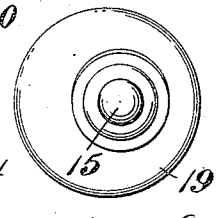


Fig. 6

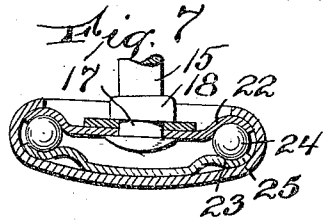


Fig. 7

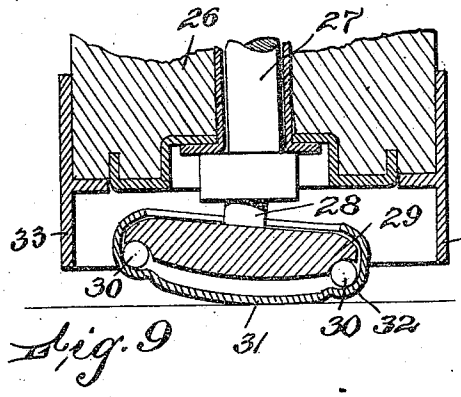


Fig. 9

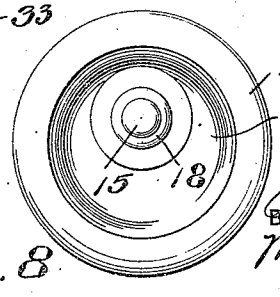


Fig. 8

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2 SHEETS—SHEET 2.

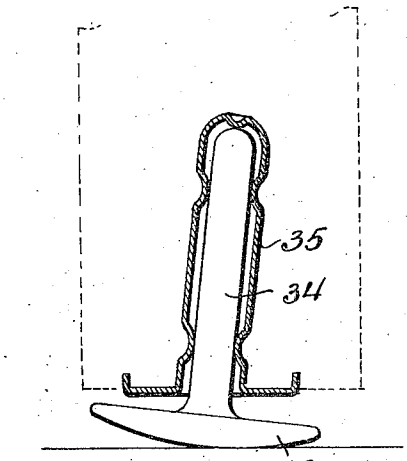


Fig. 10

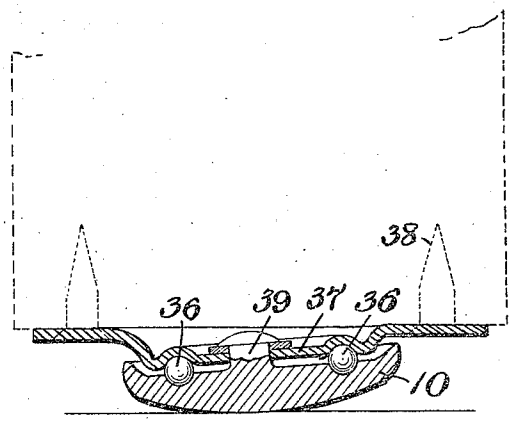


Fig. 11

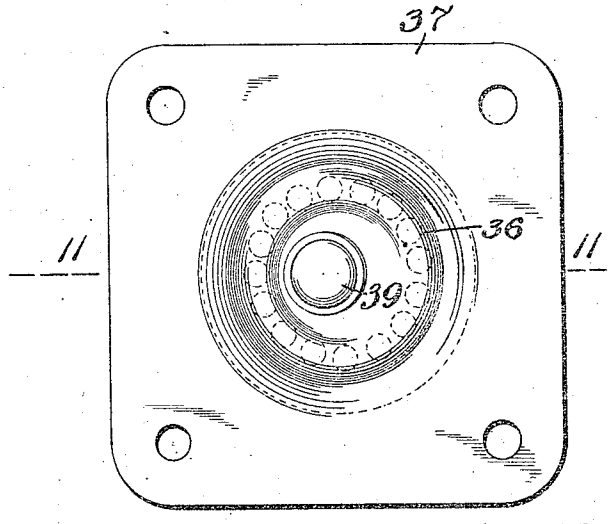


Fig. 12

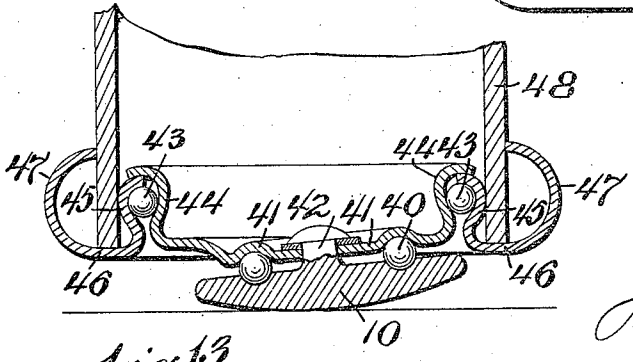


Fig. 13

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UNITED STATES PATENT OFFICE.

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CASTER.

1,421,647. Specification of Letters Patent. Patented July 4, 1922.

Application filed October 11, 1921. Serial No. 507,104.

To all whom it may concern:

Be it known that I, JEAN F. WOLFS, a citizen of the United States, and a resident of Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Casters, of which the following is a specification.

This invention relates to an improved caster which is adapted to provide an easy starting caster; in other words, one that requires but little power to move the furniture to which it is attached, and one which has such bearing on the floor as to minimize the wear on a particular part of the floor, so that there is practically no marring of polished floors or rugs when a piece of furniture employing these casters is moved or rests on such surfaces.

The invention is further designed to provide a caster which has a structure employing a minimum of height so that the proportions of a piece of furniture are not disturbed after it is mounted on such casters, and the casters are not conspicuous since they do not add materially to the height of the furniture, being capable of a flat assemblage or structure.

Another feature of the invention is the quick adaptability of the device to assume a following position when the furniture is moved, the following position and the rotation of the rolling element being simultaneous and taking place at once when the furniture begins its movement.

The invention is illustrated in the accompanying drawing, in which I show several types of my improved caster, Figure 1 being a side view of one form with the lower part of the leg of a piece of furniture being shown in dotted outline, and with the rolling element and the socket for the stem being shown in section. Figure 2 is an end view of Figure 1 with the roller shown in section, and Figure 3 is a top view of the article shown in Figure 2. Figure 4 is a side view of a modified form of construction with the lower part thereof shown in section. Figure 5 is an end view of the device shown in Figure 4, and Figure 6 is a top view thereof. Figure 7 is a detail section of the lower part of a modified form of caster. Figure 8 is a top view of the article shown in Figure 7, and Figure 9 is a section showing the lower part of a piece of furniture of heavy type, illustrating one form of caster adapted for such furniture. Figure 10 is a view showing a modified form of caster rotating on a fixed support. Figure 11 is a section of a modified form of construction, taken on line 11—11 in Figure 12. Figure 12 is a top view of the construction shown in Figure 11, and Figure 13 is a section of a still further modified form of construction.

To my improved caster I employ a rotatable element which, for clearness of description, I will identify as the roller, which has at least one face rounded or dome-shaped, the surface of such dome-shaped part being of relatively large radius so as to give a maximum of bearing or nearly a flat bearing on the floor, such rotatable element being mounted so that its plane of rotation is slightly inclined to the horizontal. Such rotatable element can be secured in many ways to the furniture, but I prefer to secure it so that it not only rotates as above described, but its axis or center of rotation is eccentric to the main support so that the following function desirable in casters is performed when the furniture is moved.

In Figure 1 the rotatable element 10 has its lower or wearing face 11 rounded or made dome-like and is rotatable on the stud 12, being held thereon in any usual or desirable way, as, for instance, by the split wire ring 13. The stud 12 is secured to the bottom part 14 of the stem 15. The stud 12 is eccentric to the stem 15, the stem 15 being made rotatable in a suitable socket or support, such as the sleeve 16, the sleeve not being described in detail since any usual or desirable sleeve or socket can be used, since they form no part of this invention. The eccentricity of the stud 12 to the stem 15 provides for the caster "following," the illustration in Figure 1 showing the position the parts would assume if the furniture was moved in the direction of the arrow, this stud 12 being canted, as will be seen from Figure 2, the cant or inclination being out of the plane passing through the axis of the stem and the center of eccentricity, so that the roller is slightly inclined from the horizontal, as shown in Figure 2. In other words, the cant is transverse or substantially transverse to the direction of the following or trailing of the stud 12 behind the stem 15, which insures a rotation of the roller, since its bearing on the floor is always to one side of its center of rotation.

In Figures 4, 5 and 6 I show a modified form of construction in which the stem 15

has its extension or stud 17 canted and having a shoulder 18 against which the shell 19 is seated, the stud 17 being secured eccentrically in the shell 19, as will be seen from Figures 5 and 6, and the rotative element 20 is secured in the shell 19 and can have easy rotation insured by suitable ball bearings 21. This structure also provides for a canting of the roller transversely to the plane of eccentricity. In other words, the axis of rotation of the roller is not parallel with the axis of the stem, and is also not parallel with the plane passing through the axis of rotation of the stem and through the eccentric position of the roller relative to such stem.

In Figures 7 and 8 I show a still further modified form in which the stem 15 and the shoulder 18 act to hold one member 22 of a ball race, the other member 23 co-operating with the member 22 to hold the series of balls 24 so that the member 23 can rotate, and the wearing or outside plate 25 is turned over at its edges to enclose and hold together such ball races and bearing lightly enough on the member 22 to provide for the rotation of the part 25. In this construction the stud 17 on the end of the stem 15 is canted and is secured eccentrically in the member 22 so that the above described functioning and relative position of the parts is accomplished.

In Figure 9 I show one type of improved caster embodying my invention which is adapted for heavy furniture, the leg 26 of the piece of furniture being supported by the stem 27 which has a stud 28 eccentrically mounted thereon similar to the structure shown in Figures 1 and 2, and having a disk 29 with grooves to receive the balls 30, which balls bear in suitable races provided in the roller 32, this providing a substantially flat caster, and when, in the case of large pieces of furniture, such as pianos, the apron or shield 33 is placed in position on the bottom of the legs, the caster is practically invisible to the casual observer.

It will be noticed too in all these structures that a considerable area of substantially flat surface bears on the floor, and there is practically no tracking or impressions made in the floor by furniture at rest or furniture being moved, since the substantially flat roller rotates in a plane slightly inclined to a plane perpendicular to the axis of the stem which supports the roller in the leg of the piece of furniture.

In some pieces of furniture, such as pull-out beds and the like, there is no necessity for swiveling the caster; in other words, there is a straight path pursued by the article of furniture, and for this type I may employ the caster shown in Figure 10, in which the rotating element 10 is held in an inclined position so that the plane of rotation of the element 10 is slightly inclined to the horizontal, and in the form shown the manner of supporting the rotatable element is embodied in a stem 34 which is arranged in the mounting 35 in the form of a sleeve secured to the leg of the piece of furniture. It will be evident from this that when this caster is mounted with its stem 34 inclined out of the plane of movement of the furniture, the rotatable element will always be held in a position where it will rotate when the furniture is moved.

In Figure 11 I show a compact form of caster designed for heavier articles of furniture, in which the rotatable element 10 supports, by means of the roller bearings 36, the plate 37 which is suitably secured by suitable means, such as the screws 38, to the bottom of the leg of the piece of furniture. The stud 39 is arranged eccentrically on the plate 37 within the ball bearings 36, and that part of the plate 37 which is supported by the balls 36 and which acts as a bearing for the stud 39, is inclined slightly to the horizontal so as to give the required rotative bearing to the caster.

In Figure 13 I illustrate a modified form in which the rotatable element 10 supports roller bearings 40 on the plate 41, the central part of this plate 41 being inclined slightly and receiving the stud 42 of the rotatable element 10, the swiveled action being provided by ball bearings 43, these ball bearings including the retaining part 44 of the plate 41 and the retaining part 45 of the base trimming or plate 46 which has its outer end crimped, as at 47, so as to hold the device on such elements as the hollow leg 48 of a brass bed or similar article of furniture, the whole forming a substantially flat support for the furniture.

It will be evident that many modifications and structural changes can be made in casters of this type without departing from the scope of the invention.

I claim:

1. A caster comprising a rotatable element, and means for mounting said element on an article so that when the article is moved the element rotates in a plane slightly inclined relative to the surface on which it rotates.

2. A caster comprising a disk with a rounded face, a stem on which the disk is rotatably secured, the parts being disposed so that the disk rotates in a plane slightly inclined to a plane perpendicular to the axis of the stem.

3. A caster comprising a stem with an eccentrically arranged roller, the roller bearing substantially flat and canted so as to rotate in a plane slightly inclined to a plane perpendicular to the axis of the stem.

4. A caster comprising a rotatable element of substantially flat form with a rounded face, and rotatable means for securing the rotatable element to the leg of a

piece of furniture so that the element rotates in a plane slightly inclined relative to the horizontal, and the axis of rotation of the element is eccentric to the axis of rotation of said means.

5. A caster comprising a stem having a substantially flat head thereon, and a bearing for said stem, said bearing being so disposed on an article supported by the caster that when the stem and head rotate the plane of rotation of the head is slightly inclined relative to the surface on which it rotates.

In testimony that I claim the foregoing, I have hereto set my hand, this 7th day of September, 1921.

JEAN F. WOLFS.

BEST AVAILABLE COPY

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,421,647, granted July 4, 1922, upon the application of Jean F. Wolfs, of Newark, New Jersey, for an improvement in "Casters," an error appears in the printed specification requiring correction as follows: Page 2, lines 123 and 124, claim 3, for the word "bearing" read *being;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of August, A. D., 1922.

[SEAL.]

KARL FENNING,

Acting Commissioner of Patents.