

R. P. HERON.

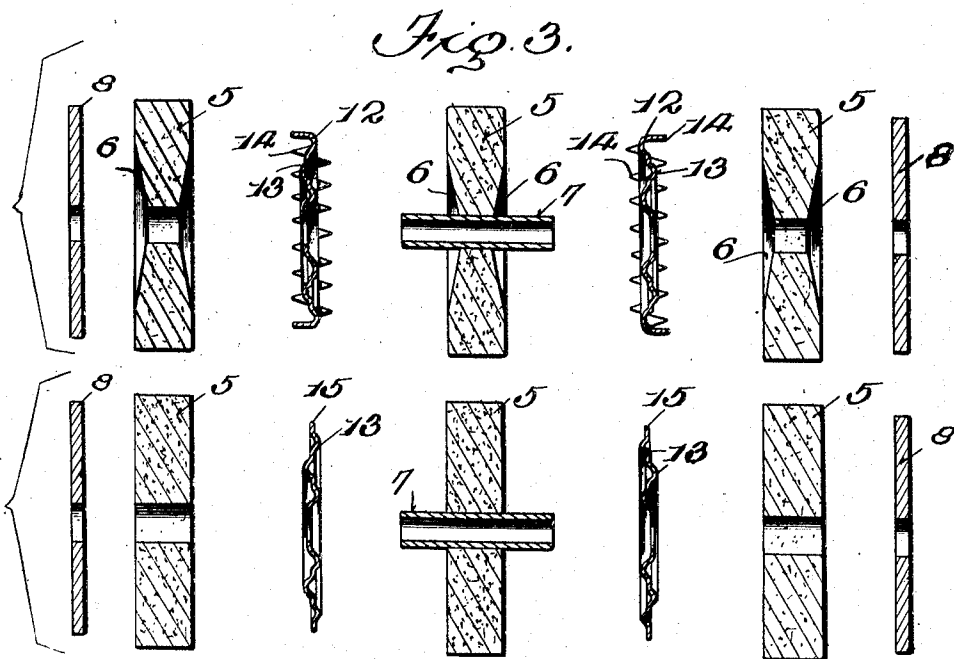
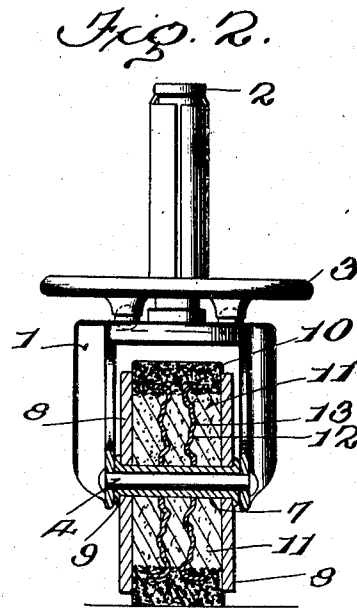
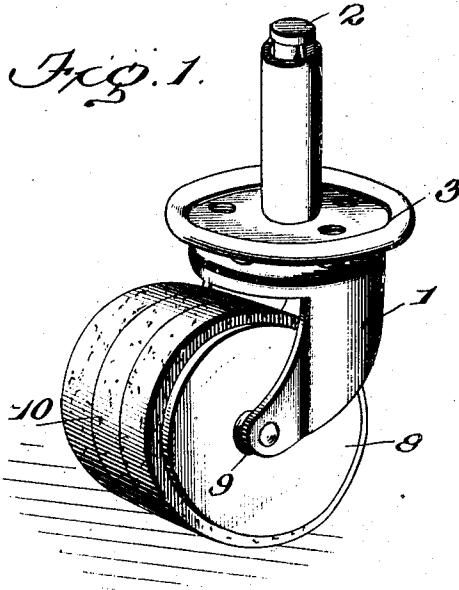
CASTER.

APPLICATION FILED DEC. 29, 1909.

998,511.

Patented July 18, 1911.

2 SHEETS—SHEET 1.



Witnesses

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Fig. 4. Robert P. Heron
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2 SHEETS-SHEET 2.

Fig. 5.

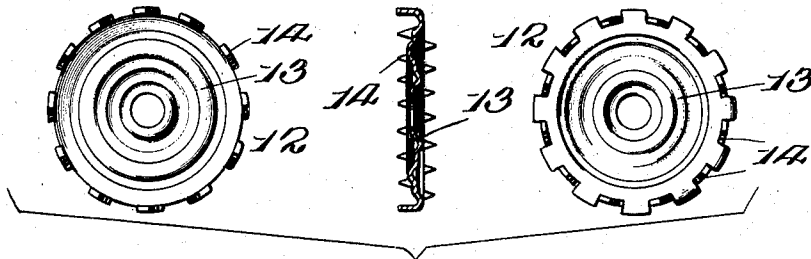


Fig. 6.

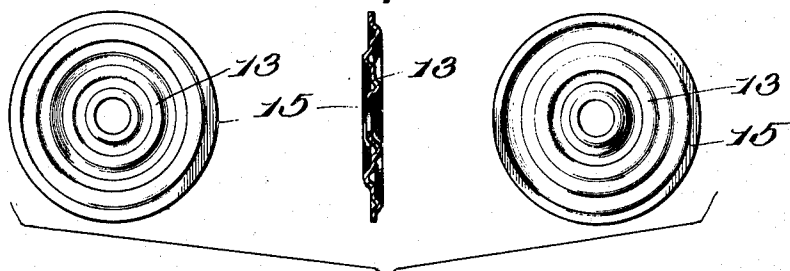


Fig. 7.

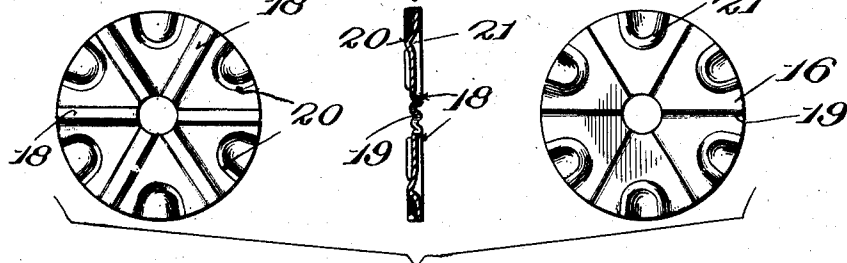
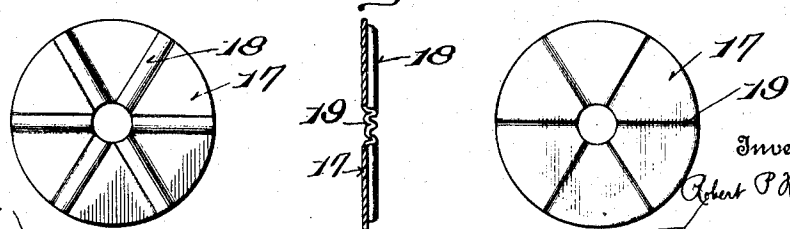


Fig. 8.



Witnesses

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UNITED STATES PATENT OFFICE.

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CASTER.

998,511.

Specification of Letters Patent.

Patented July 18, 1911.

Application filed December 29, 1909. Serial No. 535,414.

To all whom it may concern:

Be it known that I, ROBERT P. HERON, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Casters, of which the following is a specification.

My invention relates to casters and has for its object the provision of a caster having a roller of compressible material, preferably felt, of such construction as to afford a noiseless roller which will not injure the floor and which yet has the high degree of density necessary to endure without deformation the weight which it must support. These objects I attain by my invention, various embodiments of which are set forth herein.

In my caster I may use a roller of the character described in my copending application Ser. No. 520,602, in which felt disks of special form are compressed together to produce a surface of higher density than the part of the roller next within it which I term the backing. In a caster roller, however, both the surface or tread and the backing are of considerable density. The felt disks referred to have their fibers running toward and from the periphery and have depressions in their faces surrounding their center and extending outward therefrom, these depressions being formed by omitting or by cutting out or otherwise removing a part of the felt. The use of such disks makes it possible to secure a tread of a very high degree of density, the structure being obviously such that this portion of the roller is compressed materially before the backing can be compressed at all. The strength of the wheel may however be still further increased by the employment of washers intermediate the disks, and such washers may be employed with disks of the form described or with disks having plane faces. The best results, even where disks having dished faces are employed, I find to be secured by using washers having transverse projections. I prefer to make these washers of sheet metal, preferably of sheet steel stamped, in such a manner as to produce rough or irregular faces and to provide depressions in one face and corresponding projections on the other. It will be obvious

that the form of the depressions and projections may vary and that each face may have both depressions and projections, the washer having parts in various planes. It is apparent also that the number, size, form and relative arrangement of such projections and depressions may be varied widely. It will be clear also that I may employ pointed teeth formed from the substance of the washer in any suitable way. The material of the disks is forced intimately into all depressions of the washers and receives all projecting parts so that the washers are embedded in the disks and so that their irregularities help to sustain the body of the caster against transverse or radial strain. Especially where portions of each face of the washers are displaced sidewise in both directions, the washers act as keys and are an exceedingly effective strengthening means.

The various washers shown illustrate some embodiments of my invention and will no doubt suggest others. As stated these washers may be used with plane faced disks of uniform thickness or with disks having dished faces. Both constructions I find in practice to be eminently satisfactory. The washers are preferably slightly smaller than the end plates, but the relative size of the washers and plates may vary, as may of course also the absolute size of all the elements.

The number of the disks, the number of the washers and the relative width of the disks as well as their peripheral contour may obviously be varied.

In practice I have found it satisfactory to make the aggregate thickness of the felt disks substantially twice that of the body of the finished roller, and I have found it desirable in using three disks to make the center disk somewhat smaller than the other two.

A material which is noiseless and which does not injure the floors is unsized felt. If this be given the power to resist deformation, a thoroughly satisfactory caster results. I have found that my constructions above explained and more fully described herein-after are effective to do this and produce casters which meet the requirements stated. I prefer then to employ unsized felt of considerable hardness even before compression,

sized felt being objectionable for use in a caster because sizing destroys the natural characteristics of the felt which make is useful for this purpose, making it harsh and likely to scratch the floor and subject to deterioration on being exposed to moisture as casters frequently are.

It will be understood that the disks must be compressed together to such an extent that they become practically unitary and present no intermediate spaces either at the periphery or elsewhere, the washers where used being embedded.

My invention consists in a caster, various embodiments of which are illustrated and described herein and in washers therefor of special construction. Its scope will be more clearly apparent from the specification and from the claims appended thereto.

Referring to the drawings: Figure 1 is a perspective view of the complete caster, the lines of contact of adjacent disks being indicated for convenience although these would hardly be visible. Fig. 2 is an elevation showing the wheel and adjacent parts in cross section. Fig. 3 is a cross section showing the various parts of the wheel in unassembled relation, the intermediate washers illustrating the preferred form. Fig. 4 is a similar view showing plane faced disks and washers having concentric corrugations without transverse teeth. Fig. 5 shows the preferred form of washer, the views at the left and right being plan views of the respective sides of the washer, and the view in the middle being a central vertical cross section. Fig. 6 shows three similar views of another form of washer having concentric corrugations. Fig. 7 shows three similar views of another form of washer having ribs of special arrangement on opposite faces and Fig. 8 shows three similar views of a fourth form of washer having radial ribs on one side.

In the figures thus described 1 represents the horn, 2 the pintle, and 3 a socket. The caster wheel is mounted rotatably in the horn 1 in the ordinary way on a pin 4, these parts being shown in Figs. 1 and 2. The body of the wheel consists of disks 5 of compressible material preferably felt. The faces of these disks at and outward from the center are dished or provided with depressions or cut out portions 6 of suitable depth, extent and shape as shown in Fig. 3. A sleeve 7 serves as the support for the disks and retaining plates 8 hold the body of the wheel in place after it has been compressed, the ends of the sleeve being turned over at 9 upon the outer face of the said plates to secure the structure together. Where disks having depressions are employed the tread 10 of the wheel is more dense than the backing therefor which is designated by the reference numeral 11.

The structure above described may be used without intermediate washers. I prefer however to use such washers, and may do so with disks having plane surfaces as shown in Fig. 4, the irregularities in the washers furnishing additional support for the wheel without impairing its other qualities. These washers may be of various kinds, a few of which are illustrated. The washer which I designate herein as the preferred embodiment is illustrated in Figs. 2, 3 and 5. This washer 12 is provided with concentric corrugations 13 on both faces and with transverse teeth 14. It is like the washer 15 shown in Figs. 4 and 6 except that it has its outer edge serrated to form the teeth 14 which are bent transversely, preferably alternately in different directions and which form a substantially continuous periphery.

The other two forms of washers 16 and 17, illustrated respectively in Figs. 7 and 8, have radial ribs or ridges 18 on one face with corresponding grooves or depressions 19 in the other. These ridges are so arranged as to form between them wedges so that the tendency of the material is to wedge between them and thereby to be supported. The washer 16 has in addition to the said grooves and depressions ribs 20 and grooves 21 forming what are substantially U's or V's in form and having an action substantially similar to that of the other ribs referred to. The ribs may be on one or on both sides.

The elements making up the wheel of the caster are shown unassembled in Figs. 3 and 4. They are assembled and compressed into the complete caster wheel in any suitable power press. During compression lateral expansion is suitably guarded against by the provision of a press chamber of the proper shape having unyielding walls, and any tendency of the end plates to embed themselves in the end disks may be prevented by providing each end of the press chamber with an annular ring surrounding the end plate and terminating in the plane of its inner face or preferably in a bevel beyond said face toward the disks. As stated I use unsized felt and I do not find it necessary to use water, sizing or any other liquid but prefer to compress the disks while dry. After the wheel has been formed in this manner it is a thoroughly good caster and may be used without finishing, but its rather rough and unfinished appearance is unattractive to the eye. It is therefore preferably treated by any of the methods commonly employed for treating raw felt surfaces and raw surfaces of other compressible materials so as to eliminate any inequalities, insure perfect uniformity in the contour of the wheel, and improve its appearance.

Between the center of the washer and its periphery lies the "body" of the washer, and it is in this portion of the face of the

washer that the projections roughening the same are, with the exception of the peripheral teeth, at least in part located.

What I claim as my invention is:

1. A caster having a horn and pintle, and a wheel rotatably mounted in said horn and comprising a dense felt body highly compressed and forming a compressed backing and a compressed annular tread surrounding it, said felt extending continuously from the backing into the surrounding annular tread, and said annular tread being more highly compressed than said backing, retaining plates for said body, and means for securing the plates in place.
2. A caster having a horn and pintle, and a wheel having a dense body, rotatably mounted in said horn and comprising a plurality of felt disks highly compressed and forming a compressed backing and a compressed annular tread surrounding it, said felt extending continuously from the backing into the surrounding annular tread, and said annular tread being more highly compressed than said backing, retaining plates, and means for securing the plates in place.
3. A caster having a horn and pintle, and a wheel rotatably mounted in said horn and comprising a sleeve, plates on said sleeve, and felt disks on the sleeve between said plates having parts of their faces surrounding the center cut away at and continuously outward therefrom, the disks being compressed together and being retained in place by the plates.
4. A caster having a horn and pintle, and a wheel rotatably mounted in the horn and having a dense body of compressible material, a sheet metal washer within said body of but slightly less diameter than said body and having faces roughened by projections lying at least in part on the body of the

washer between the center and the periphery thereof, said washer being embedded in said body, and retaining plates for the body.

5. A caster having a horn and pintle, and a wheel rotatably mounted in the horn and comprising a plurality of felt disks, one or more sheet metal washers intermediate said disks and having concentric corrugations, these elements being compressed together to embed the faces of the washers in the material of the disks thus highly compressed, and retaining plates for the dense body thus formed.

6. A caster having a horn and pintle, and a wheel rotatably mounted in the horn and comprising a plurality of felt disks, one or more sheet metal washers of but slightly less diameter than said disks intermediate said disks having indentations in one face and corresponding projections on the other and having transverse teeth adjacent its periphery, these elements being compressed together to embed the faces of the washers in the material of the disks thus highly compressed, and retaining plates for the dense body thus formed.

7. A caster having a horn and pintle, and a wheel rotatably mounted in the horn comprising a plurality of felt disks and intermediate sheet metal washers having a diameter but slightly less than that of the felt disks, having projections from their faces at varying distances from their centers and embedded in said felt disks, and retaining plates.

Signed by me at Syracuse, New York, this 29th day of October 1909.

ROBERT P. HERON.

Witnesses:

RAE E. KAPLAN,
FRANK R. LEMROL.