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[54] **SHAFT ENGAGING KNOB**

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[51] **Int. Cl.²** **A47B 95/02**

[58] **Field of Search** 16/121; 292/353, 349; 403/361, 383, 345; 74/531, 553

[56] **References Cited**

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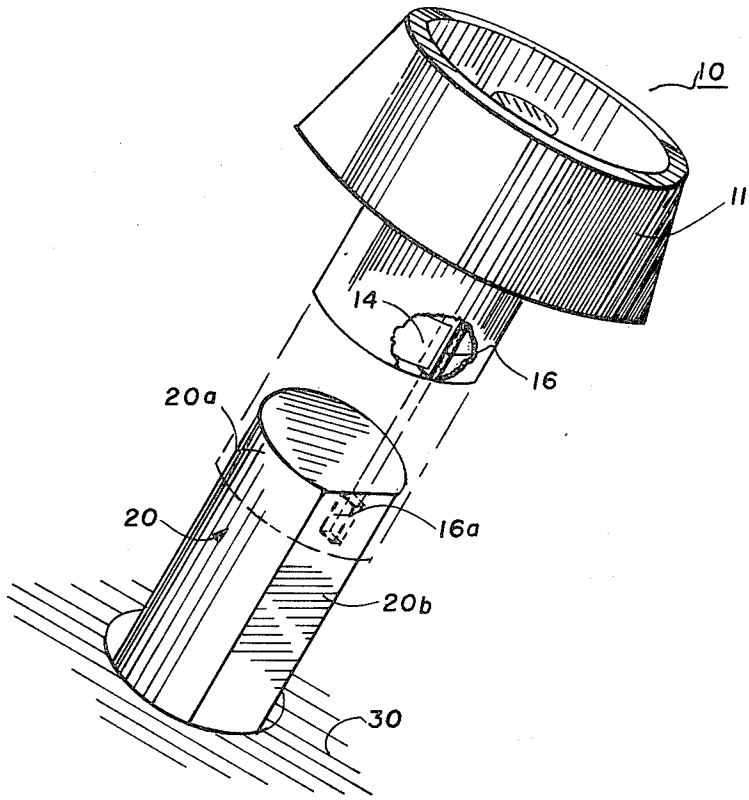
[57] **ABSTRACT**

Disclosed is a knob adapted for nonrotatable engagement with different cross-sectionally configured shafts, the knob having an internal, longitudinally extending cavity for receiving the shaft, a spring disposed within the cavity, and a projection extending into the cavity a sufficient distance, and having a width dimension, to enable the knob to be so coupled.

1 Claim, 4 Drawing Figures



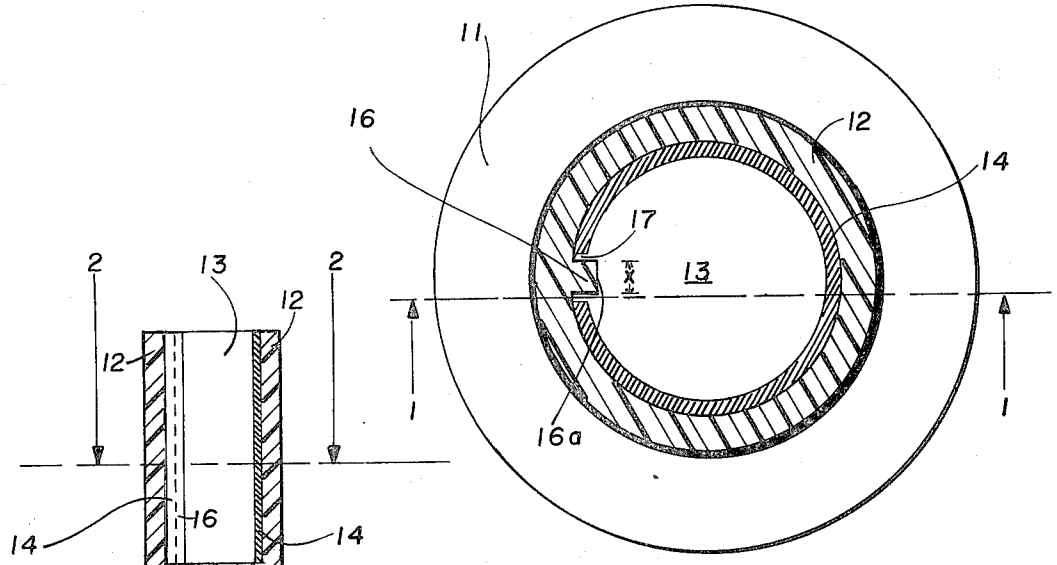


FIG. 2

FIG. 1

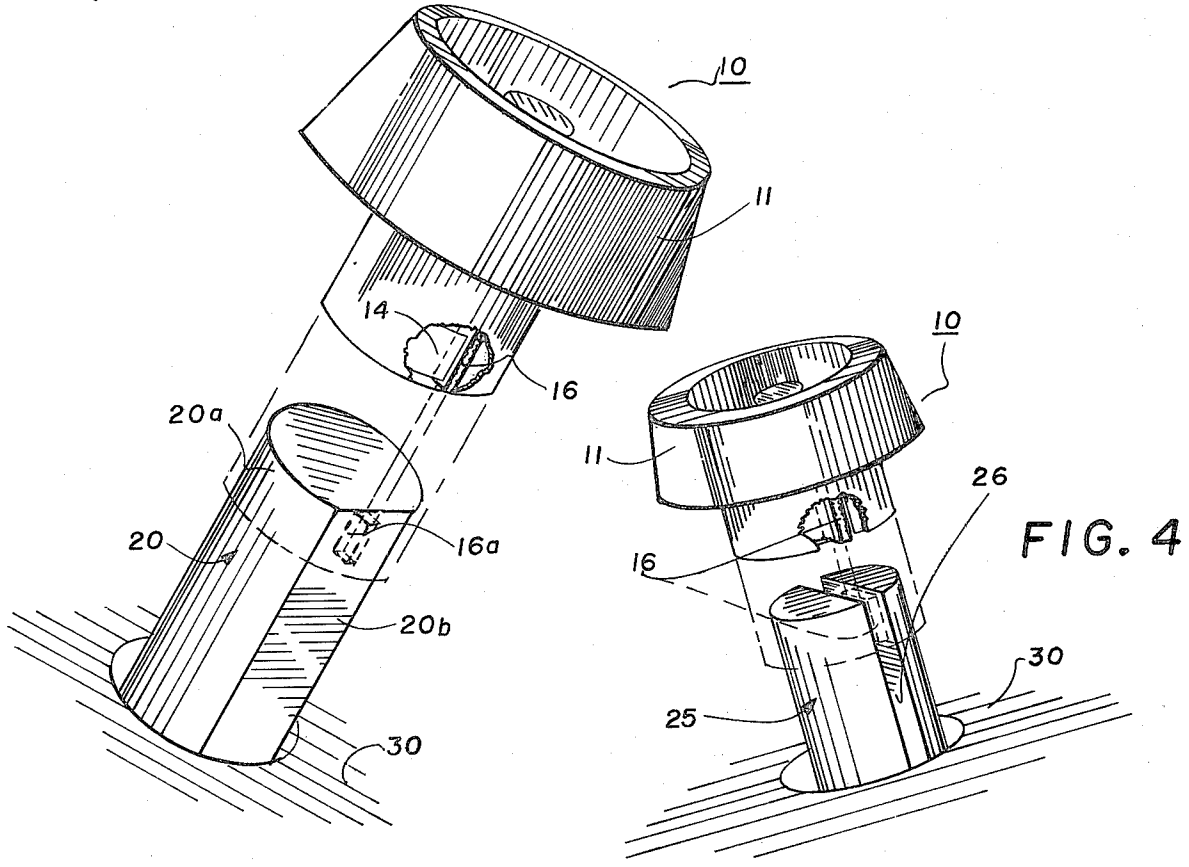


FIG. 3

FIG. 4

SHAFT ENGAGING KNOB

The present invention relates to knobs, and more particularly to knobs adapted for nonrotatable engagement with rotatably mounted shafts.

There are many applications where it is necessary to couple a knob with a rotatably mounted shaft to effect the rotation thereof. For instance, radio receivers have tuning and volume control shafts, the rotation of the knobs coupled thereto effecting the desired operation of the receiver. Since there are many manufacturers of these radios, there are consequently a wide variety of shaft configurations, the most commonly employed being a truncated cylindrical (or D-shaped) configuration and a split or notched cylindrical configuration. As a consequence of this variation in shaft configurations, each knob, up to now, has had to have an internal configuration uniquely adapted for the particular shaft to which it is coupled. Thus, suppliers of knobs have to maintain increased inventory to take into consideration the differently configured shafts.

It is therefore a principal object of the present invention to provide a new and improved knob adapted for nonrotatable engagement with a rotatably mounted shaft.

It is another object of the present invention to provide a knob having an internal configuration adapted to interchangeably engage with shafts having different cross-sectional configurations.

It is an even still further object of the invention to provide a knob adapted for nonrotatable interchangeable engagement with shafts having a truncated cylindrical configuration as well as shafts of the notched or split type.

In accordance with these and other objects, the present invention is directed to a knob adapted for nonrotatable engagement with a rotatably mounted shaft, the knob having an internal, longitudinally extending cavity for receiving the shaft, and a projection extending into the cavity a sufficient distance, and having a width dimension, to enable the knob to nonrotatably engage different cross-sectionally configured shafts.

Additional features, as well as further objects and advantages of the invention, will become more readily understood from the following detailed description to be read in conjunction with the attached drawings, in which like numerals refer to like or similar parts, and in which:

FIG. 1 is a view in longitudinal section of a preferred embodiment of the knob of the invention, taken along the section line 1—1 of FIG. 2;

FIG. 2 is a sectional view taken along the line 2—2 of FIG. 1;

FIG. 3 is an isometric view illustrating the engagement of the knob of the present invention with a rotatably mounted shaft of one cross-sectional configuration, a portion of the view of the knob illustrated as being broken away to provide a clear view of certain features thereof; and

FIG. 4 is an isometric view illustrating the engagement of the knob of the present invention with a rotatably mounted shaft of a different cross-sectional configuration than that of FIG. 3, a portion of the view of the knob illustrated as being broken away to provide a clear view of certain features thereof.

The drawings are not necessarily to scale and in some instances have portions which have been exaggerated to more clearly illustrate features of the present invention.

Referring initially to FIGS. 1 and 2, a preferred embodiment of the shaft engaging knob of the present invention is broadly depicted by the reference numeral 10. Accordingly, the knob comprises a main body including a conventional finger engaging portion 11 and a longitudinally, circumferentially extending wall portion 12. The exterior of the knob 10 may be of any desired shape or appearance, and is not critical to the present invention, one such shape being depicted for convenience in the drawings.

The wall portion 12 surrounds, and defines thereby, a longitudinally extending socket or cavity 13 adapted to slideably receive a shaft, as subsequently described. Mounted within the cavity 13 adjacent the inner surface of the wall portion 12 is a resilient or spring-like sleeve 14 adapted to resiliently engage the so-inserted shaft.

As a unique feature of the present invention, a projection 16, extending from and preferably molded with, the wall portion 12 extends through a cleft 17 of the resilient sleeve or ring 14 into the cavity 13. The projection 16 is desirably, although not critically, of a generally rectangular configuration extending the entire longitudinal dimension of the cavity 13. As subsequently described, the projection 16 extends into the cavity 13 a sufficient distance, and has a width "x", which enables the knob to nonrotatably grip shafts having the cross-sectional characteristics respectively depicted in, and in the manner now described with respect to, FIGS. 3 and 4.

Specifically, and with initial reference to FIG. 3, a shaft 20 is depicted having a truncated cylindrical, or generally D-shaped, configuration. The shaft 20 may be, for example, the conventional tuning shaft of a radio receiver and is rotatably mounted (by means not shown) through an opening in a receiver housing 30. When the knob 10 is slideably received by, and has its cavity 13 impressed upon, the end of the shaft 20, the spring or sleeve 14 firmly engages the periphery of the cylindrical surface 20*a* of the shaft, and face 16*a* of the projection 16 engages the flat surface portion 20*b* thereof. As a consequence thereof, the knob 10 is prevented from rotation with respect to the shaft 20, and rotation of the knob results in the consequent rotation of the rotatably mounted shaft.

The knob 10 can also nonrotatably engage, and effect the rotation of, a rotatably mounted shaft having a configuration the same or similar to the shaft 25 depicted in FIG. 4. As before, the shaft 25 can be rotatably mounted within an opening in the housing 30, the shaft in this instance having a generally cylindrical configuration with a diametrically extending split or notch 26 therein. In this case, when the knob 10 has its cavity 13 impressed upon the end of the shaft 25 (the resilient collar 14 engaging the periphery of the shaft), the projection 16 (which has a width "x" slightly less than the width of the notch 26) is inserted into, and held by, the notch 26. As a consequence of this mating engagement, rotation of the knob 10 results in the consequent rotation of the shaft 25.

It is thus observed that a knob has been provided which has an internal shaft engaging portion which enables the knob to be interchangeably coupled with more than one cross-sectional type of shaft while still being

restrained from relative rotation with respect to the shaft itself.

Various modifications to the disclosed embodiment, as well as alternate embodiments, of the present invention may become apparent to one skilled in the art without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A knob adapted for non-rotatable and interchangeable engagement with a first rotatably mounted shaft having a D-shaped end cross-section defined by a circular portion terminating in a flat chordal segment as well as a second rotatably mounted shaft having an end cross-section defined by two semicircular portions separated by a diametrically extending notch, said knob comprising:

a. a circumferentially extending wall defining a centrally disposed longitudinally extending cavity for respectively receiving said first and second rotatably mounted shafts, said circumferentially extending wall having an end cross-section defined by an entirely circular shaped surface portion solely interrupted by a projection of said wall portion extending into said cavity, said projection having a flat face thereof; and

b. a circular spring having its major portion adjacent to, and conforming to the shape of, the circular shaped surface portion of said circumferentially extending wall, said spring further having end portions terminating adjacent said projection;

c. said first rotatably mounted shaft, when received within said cavity, having its circular portion resiliently engaged by said spring along its entire circumference, the flat chordal segment being engaged by the flat face of said projection;

d. said second rotatably mounted shaft, when received within said cavity, having its two semicircular portions entirely surrounded by the circular shaped surface portion of said circumferentially extending wall and resiliently engaged by said spring along the entire circumference of said semicircular portions with the projection extending into said notch.

2. A knob adapted for non-rotatable and interchangeable engagement with a first rotatably mounted shaft having a D-shaped end cross-section defined by a circular portion terminating in a flat chordal segment as well as a second rotatably mounted shaft having an end cross-section defined by two semicircular portions separated by a diametrically extending notch, said knob comprising:

a. a circumferentially extending wall defining a centrally disposed longitudinally extending cavity for respectively receiving said first and second rotatably mounted shafts, said circumferentially extending wall having an end cross-section defined by an entirely circular shaped surface portion solely interrupted by a projection of said wall portion extending into said cavity, said projection having a flat face thereof; and

b. resilient means disposed at the interface of the circular shaped surface portion of said circumferentially extending wall and said cavity;

c. said first rotatably mounted shaft, when received within said cavity, having its circular portion resiliently engaged by said resilient means along its circumference, the flat chordal segment being engaged by the flat face of said projection;

d. said second rotatably mounted shaft, when received within said cavity, having its two semicircular portions entirely surrounded by the circular shaped surface portion of said circumferentially extending wall and resiliently engaged by said resilient means along the circumference of said semicircular portions with the projection extending into said notch.

3. A knob adapted for interchangeable and non-rotatable engagement with first and second types of tuning and volume control shafts of radio receivers, the said first type of shaft having an end cross-section of truncated cylindrical configuration and the said second type of shaft having a notched cylindrical configuration, said knob comprising:

a. a first finger engaging portion; and

b. a second shaft engaging portion joined with said first finger engaging portion, said second shaft engaging portion comprising a circumferentially extending wall portion defining a centrally disposed longitudinally extending cavity adapted for slidably receiving the end of either said first or second type of shaft, said circumferentially extending wall portion having an end cross-section defined by an entirely circular shaped surface portion solely interrupted by a projection of said wall portion extending into said cavity, said projection having a flat face thereof;

c. the end of said first type of shaft of truncated cylindrical configuration, when received within said cavity, having its cylindrical portion completely surrounded by the circular shaped portion of said circumferentially extending wall portion, the truncated segment of said first type shaft being engaged by the flat face of said projection, whereby said knob is restrained from rotation with respect to said first type shaft;

d. the end of said second type of shaft of notched cylindrical configuration, when received within said cavity, having its cylindrical portion completely surrounded by the circular shaped portion of said circumferentially extending wall portion, the said projection extending into the notch of said second type shaft, whereby said knob is restrained from rotation with respect to said second type shaft.

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