

[54] **FRICTION FIT KNOB**

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[22] Filed: **Dec. 7, 1970**
[21] Appl. No.: **95,691**

[52] U.S. Cl. **292/349, 292/DIG. 38, 287/53 H**
[51] Int. Cl. **E05b 3/00**
[58] Field of Search **292/349, 348, DIG. 38; 70/445;**
16/121-122; 287/53 H, 126

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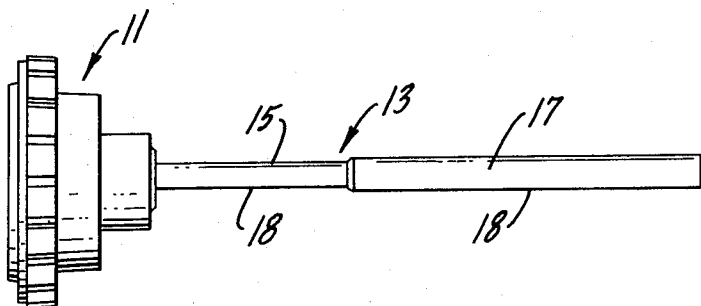
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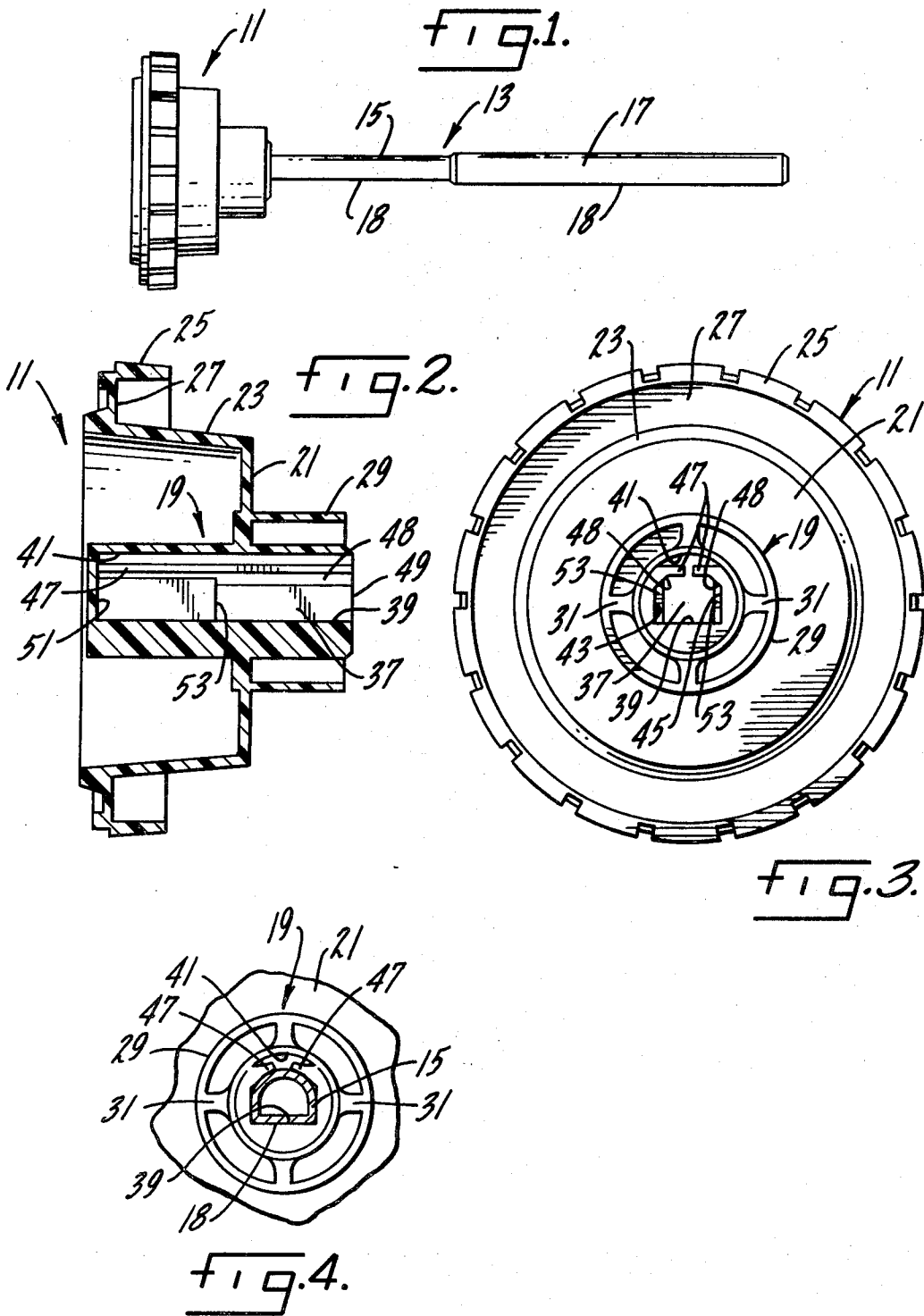
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[57] **ABSTRACT**

A molded knob of the type which fits over the end of a shaft and is held thereto by means of frictional engagement between the knob and the shaft. The knob has a hub with a shaft receiving socket formed therein. The socket is of irregular transverse cross-section and has a flat wall which engages a flat on the shaft. Fingers formed integrally with the hub extend into the socket. The fingers are located on the opposite side of the socket from the flat wall and are deflected in a direction away from the flat wall upon insertion of the shaft to frictionally secure the knob to the shaft. Stop means are formed in the socket to limit the depth of insertion of the shaft. The fingers extend into the socket beyond the stop means to provide flexibility throughout their contact with the shaft.

3 Claims, 4 Drawing Figures





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FRICTION FIT KNOB

SUMMARY OF THE INVENTION

This invention is concerned with a knob which fits over the end of a shaft and is held thereto by frictional engagement and more particularly with such a knob that is molded in one piece.

An object of this invention is a knob which will fit over and frictionally engage the end of a shaft without the need for springs, separate wedges or fasteners.

Another object is a molded one piece knob that will maintain a secure friction fit on a shaft.

Another object is a knob which is relatively simple and inexpensive to mold.

Other objects may be found in the following specification, claims and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is illustrated more or less diagrammatically in the following drawings wherein:

FIG. 1 is a side elevational view of a knob of this invention mounted on a hollow shaft;

FIG. 2 is an enlarged longitudinal cross-sectional view taken through the knob of FIG. 1;

FIG. 3 is a rear elevational view of the knob of FIG. 2; and

FIG. 4 is an enlarged partial rear elevational view of the knob and shaft of FIG. 1 showing the shaft inserted in the socket with the deflection of the fingers exaggerated for clarity of illustration.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 of the drawings shows a molded knob 11 embodying the novel features of this invention mounted on a hollow tubular shaft 13. As shown in the drawings, the shaft may be made in two sections, 15 and 17, one of which telescopes into the other. The shaft sections are customarily made of a metal tubing such as aluminum and are of generally circular cross-section with flats 18.

The knob 11 is molded from a thermoplastic material such as nylon. The knob includes a hub 19. Integrally connected to the hub 19 is a radially extending wall 21. A sloping cylindrical wall 23 is integrally attached to the radial wall 21. An outer flange 25 is connected to the cylindrical wall 23 by a radially extending annular wall 27. The portion of the hub 19 which is located rearwardly, that is to the right as viewed in FIGS. 1 and 2, of the radial wall 21 is surrounded by a cylindrical wall 29. Radial ribs 31 connect the cylindrical wall 29 and the hub 19.

The hub 19, which is generally cylindrical in shape, has a shaft receiving socket 37 formed therein. The socket is of irregular transverse cross-section with a flat wall 39 on one side thereof. The other side of the socket has an arcuate wall 41. Opposite flat walls 43 and 45 complete the socket. Extending out of the flat walls 43 and 45 and projecting toward each other are generally identical fingers 47. The fingers are of generally rectangular cross-section, are aligned with each other and terminate short of each other. Sloped walls 48 are located between the fingers and the flat walls 43 and 45. The fingers 47 extend longitudinally from the opening 49 at the entrance of the socket to the bottom thereof where they merge

with the bottom wall 51 of the socket. Shaft engaging stops 53 are positioned in the socket between the entrance opening 49 and the bottom 51.

The use, operation and function of this invention are as follows:

When the shaft 17 is inserted into the socket 37 of the knob 11, it must be positioned with the flat portion 18 of the shaft section 15 in contact with the flat wall 39 of the socket. Because of dimensioning of the socket and the shaft section 15, the shaft can only be inserted when oriented in this manner. Upon insertion of the shaft section 15, the fingers 47 of the hub 19 are bent radially outwardly and away from the flat wall 39. The inherent resilience and flexibility of the fingers will exert sufficient force on the shaft section 15 to securely hold it in position. The forces exerted by the knob against the shaft section 15 due to turning of the knob are exerted against the flat wall 18 of the shaft section by the flat wall 39 of the socket. Therefore, the fingers 47 are not affected or weakened by the normal turning forces exerted against the knob. Thus, the design of the knob hub of this invention provides a tight fit between the knob 11 and the shaft 13 which resists loosening without resorting to the use of springs, fasteners or wedging devices.

Flexibility of the fingers 47 is obtained even though they connect to the bottom wall 51 of the socket by molding the fingers so that they extend into the socket beyond the area of contact of the fingers with the shaft 13. This is accomplished through the provisions of the stops 53 which limit the depth of insertion of the shaft into the socket 37. This feature provides flexibility without requiring the ends of the fingers at the bottom of the socket to be spaced from the wall 51. Consequently, the construction of the core pin which is used to mold the socket portion of the knob is greatly simplified.

Whereas, the preferred form of the invention has been shown and described it should be understood that there are many modifications, substitutions and alterations which may be made without departing from the fundamental theme of this invention. Therefore, the scope of the invention should be limited only by the following claims.

I claim:

1. A molded knob of the type which frictionally engages and slips over the end of a shaft,
a hub formed as part of said knob,
a shaft receiving socket formed in said hub,
said socket being of irregular transverse cross-section and having a flat wall adapted to engage a flat on said shaft, and
elongated fingers formed as part of said hub and extending into said socket on the opposite side of said socket from said flat wall,
said fingers extending toward and in alignment with each other and being laterally deflectable in a direction away from said flat wall upon insertion of said shaft into said socket.

2. The knob of claim 1 further characterized in that shaft engaging stop means are provided in said socket to limit the depth of insertion of said shaft into said socket and said fingers extend into said socket beyond said stop means.

3. The knob of claim 1 further characterized in that said fingers are generally rectangular in cross-section and are positioned to extend parallel to said flat wall.

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