

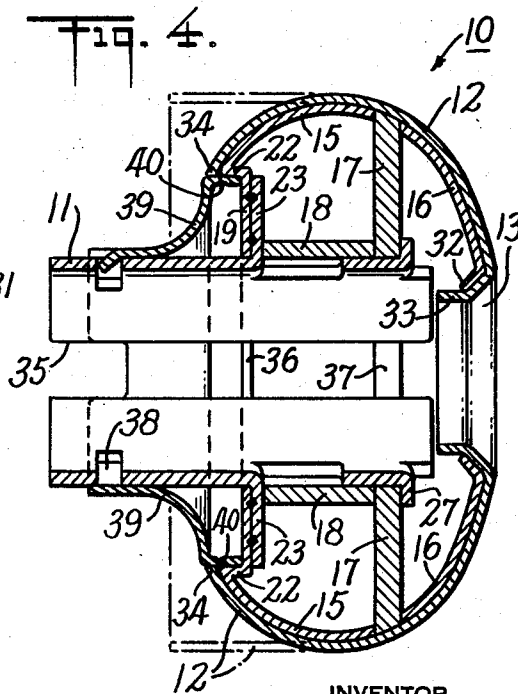
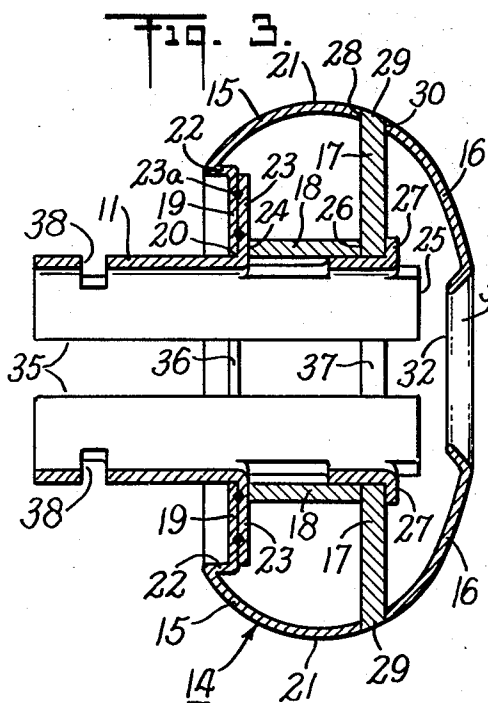
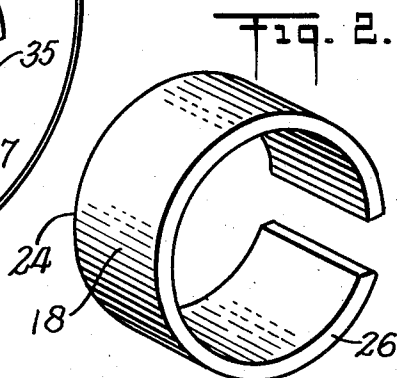
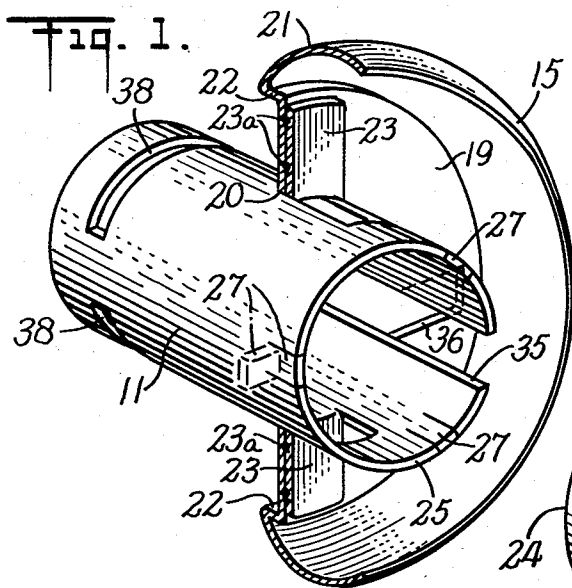
Aug. 19, 1958

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2,848,264

DOOR KNOB STRUCTURE

Filed May 25, 1955



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2,848,264

DOOR KNOB STRUCTURE

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Application May 25, 1955, Serial No. 510,901

9 Claims. (Cl. 292—347)

This invention relates to a door knob structure, and more particularly to an armored door knob.

It is an object of the invention to provide a door knob structure, particularly one in which all or part of the knob construction employs sheet metal from which a seamless knob portion is presented externally, such as secured by die-forming and/or spinning a continuous shell.

Known to me is the provision of door knobs in which a plurality of shell members are inter-nested and joined to a shank, with the parts spun in relation to each other, particularly where generally conforming inner and outer shells are interconnected, which in some instances include arranging the closed section of one shell adjacent the open portion of another shell, or conformingly spinning an outer shell over an inner substantially congruent shell. Such structures leave much to be desired in that substantial portions of the shells with respect to the axial shank are left unsupported, particularly when subjected to the rigorous final treatments of spinning, shaping, and the chemical, thermal and, in instances, electro-chemical finishing operations, to decorate the knob structure, thus placing a limitation upon the shape of the knob and the nature of the materials which may be employed for assembling the knob structure.

In accordance with my invention, it is an object thereof to provide an armored knob which may be made of a more or less seamless outer shell, coupled by spinning or otherwise forming such outer shell to an inner supporting framework, of which a shank piece is a part, the structure lending itself to the use of a wide variety of sheet materials, or combinations thereof, to secure a rugged assembly.

More particularly, it is an object of my invention to provide an armored knob in which an outer shell is spun about a skeleton inner assembly, permitting of a wide choice of materials which may be combined, without sacrificing accuracy of relation of the shank with respect to the knob, where this may be used in a cylindrical door knob assembly, to mount a key controlled lock and without material restriction on the use of thermal and electro-chemical processes for finishing the knob structure.

Still more particularly, it is an object of my invention to provide a knob structure in which a shank piece has initially assembled with it a skeleton frame work of supporting elements in which the shank piece and outer shell supporting elements are intimately united to each other to provide a rugged support for the outer shell in the finishing operations thereof, and to resist the stresses in finishing and use, with a wide variety of sheet metals and other materials which may be employed.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, I make reference to the accompanying drawing forming a part hereof, in which—

Figure 1 is a fragmentary perspective view of a knob segment;

Figure 2 is a perspective view of a detail;

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Figure 3 is a longitudinal section of the assembly of the elements shown in Figures 1 and 2;

Figure 4 is a longitudinal section of the completely formed knob structure.

Making reference to the drawing, I will describe my invention in connection with a knob structure 10, having a shank piece 11 of generally cylindrical or tubular outline, arranged to be mounted upon or joined to or form a part of a spindle of a cylindrical door lock. The shank piece is arranged to carry the outer ornamental shell 12 which may optionally be closed at its extreme axial portion 13. In the illustration, the outer shell 12 is intended to receive and support a key actuated tumbler lock assembly and is formed with a tumbler lock opening.

The shank piece 11 in turn carries the inner supporting skeleton 14 consisting of an inner partial shell 15, an endwise partial shell 16, an annular bracing disk 17 and a spacer sleeve 18. In the formation of the supporting skeleton 14, the inner shell 15 includes a died-out partially ovoid piece including an axial radially directed flange in the form of a disk 19, perforated to envelope the shank piece 11 at its central portion 20 to provide a snug or driving fit, the peripheral portion 21 being arcuately shaped and joined to the disk portion 19 by an offset 22. The disk portion 19 is sleeved over the shank piece 11 until it abuts a plurality of lugs 23, struck up from the shank piece 11. In the illustration, two diametrically positioned lugs 23 are shown. Additional radially spaced lugs may be added, as found desirable.

The disk portion 19 and lugs 23 are arranged to extend in parallelism and a union of the lugs and disk may be effected by spot welding 23a, although brazing, riveting and similar uniting means may be employed. Thereupon, the spacer sleeve 18 is sleeved over the outer portion of the shank piece 11 to abut the lugs 23 at its end 24. With the sleeve 18 in position, the annular bracing disk 17 is mounted upon the free end 25 of the shank piece 11, to abut the end 26 of the sleeve 18. The assembly is then joined by staking the edges of the shank piece 11 or by striking up locking tongues 27 radially into contact with the disk 17 at its outer face.

With the structure described, the inner partial shell 21 has its edge 28 brought co-terminous with the peripheral edge 29 of the bracing disk 17. To this assembly is fitted the endwise partial shell 16, to bring its edge 30 to inter-fit the peripheral edge 29 of the bracing disk 17.

The endwise partial shell 16 may be completely closed at its central portion. In the illustration it is made with an inwardly directed flange 31, having an annular lip 32.

With the parts as described, the skeleton framework 14 is inserted in an outer shell 12, whose general dimensions in an intermediate stage are shown in dotted lines in Figure 4. Where the knob structure is intended to support a key actuated pin tumbler or like assembly, the shell 12 is formed initially with an inwardly directed rim 33, over which the annular lip 32 and the outer partial shell may be sleeved. Thereupon the shell 12 is spun into conforming position so that the edge 34 is brought into enveloping position over the offset 22 and intimately draws the outer shell into conforming frictional engagement with the periphery of the inner shell 14, the bracing disk 17 and the endwise partial shell 16, integrating the outer shell and the supporting skeleton frame.

Full support is found for all segments of the outer shell 12, to provide rugged reinforcement throughout the entire spinning operation and in use, and permitting ovoid cross-sectional contours of various degrees from elliptical to spherical, with assurance of supplying full support in all sections in accordance with the shapes which may be found desirable.

In the illustration, where the knob structure is intended for use with a key operated tumbler assembly, the shank

piece 11 is preliminarily formed with a slot 35 in alignment with a slot 36 formed in the flange 19, to receive the driver pin casing of a pin tumbler lock assembly, and for this purpose the bracing disk 17 may likewise be formed with a slot 37. The shank piece 11 may be formed with latch receiving cutouts 38 to effect keying between it and the spindle. Upon completion of the knob assembly, a knob bottom piece 39 is snapped into position, to close the socket formed by the offset 22 and surrounding the annular edge 34, there being provided detent protrusions 40 frictionally to fit within the offset to hold the knob bottom piece 39 in position adjacent the edge 34.

By the construction described, rigid integration of the skeleton framework 14 and the shank piece 11 is effected substantially throughout the entire length of the shank piece 11. All portions of the outer shell may be given predetermined contour without danger of warping, collapsing or distortion, particularly where materials of different reactivity to thermal and electro-chemical or like changes are employed, and particularly where one or more of the component elements may utilize aluminum for the ornamental reactivity of this material in various known ornamenting treatments.

Furthermore, the spherical support at all major peripheral areas provides reinforcement and true axial positioning of the knob portions to each other, to assure long life and accurate assembly.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

1. A door knob structure comprising a shank piece carrying an outer shell member, said shank piece having a skeleton frame comprising contiguously positioned annular members spaced along the length of said shank piece from and about the peripheries of which the outer shell is circumferentially supportingly shaped, the combination including radial distortion resisting means at the contiguous junction of said annular members.

2. A door knob structure comprising a shank piece section and an outer shell member, said shank piece section having a skeleton frame comprising annular bracing members, one being spaced adjacent one end of the shank piece section and the other being spaced at an intermediate position, interlocking lugs on said shank piece section and one of said bracing members to provide radial distortion resisting means about the peripheries of which the outer shell is circumferentially spun conformingly.

3. A door knob structure comprising, in combination, a tubular shank piece section, said shank piece section having mounted thereon a skeleton frame of an inner partial shell member, and an endwise partial shell member to each side of an annular bracing disk member, lugs struck from said shank piece section coupled to the inner partial shell member and an outer shell conformingly spun about said inner partial shell member, the periphery of said bracing disk member, and endwise partial shell member.

4. A door knob structure comprising a shank piece, an inner shell having a flange mounted to encircle said shank piece at an intermediate portion thereof, lugs extended from said shank piece and united to said flange, a spacer sleeve on said shank piece, interposed between such flange and a disk abutting said sleeve adjacent the

opposite end of said shank piece and an outer shell member conformingly spun about said inner shell and the periphery of said disk.

5. A knob structure comprising a shank piece as an axially extended member having mounted thereon transversely thereto an inner shell member, an endwise partial shell member, one of which members being sleeved at a position spaced from both ends of said shank piece, the other of which members being sleeved adjacent the end of said shank piece, coupling means between said shank piece and one of said members and an outer shell conformingly spun to and over the circumferential surfaces of both of said shell members.

6. A door knob structure comprising a tubular shank piece, lugs struck up from said shank piece at a portion intermediate its opposite ends, a skeleton frame comprising an inner shell having a flange, a bracing disk mounted to encircle said shank piece, a spacer sleeve interposed between said lugs and bracing disk on said shank piece including means to hold said disk in sleeve abutting position by means extended from an end of said shank piece, and an outer shell member conformingly spun to and over the peripheral portions of the disk and of said skeleton frame to encase the same.

7. A door knob structure comprising a shank piece having extending lugs and carrying an outer shell member, said shank piece having a skeleton frame comprising an inner partial shell member having a flange affixed to said lug members, a bracing disk sleeved over said shank piece and arranged to abut said inner partial shell member on the periphery thereof, a spacer sleeve mounted on said shank piece to abut, at one end, said lug members, and at the other end to abut said bracing disk, an endwise partial shell member arranged peripherally to abut said bracing disk, said outer shell member being conformingly spun about the periphery of said skeleton frame.

8. In a door knob structure wherein a shank piece is arranged to carry an outer shell member peripherally spun over a skeleton frame, a skeleton frame comprising a plurality of annular partial shell members, each of said shell members including at least one radially extending bracing disk adjacent an end thereof, the peripheries of said partial shell members being in abutting position, with a face of said disk and coterminous therewith.

9. A door knob structure in accordance with claim 8 wherein a sleeve is interposed on said shank piece in a position between said partial shell members over said shank piece abutting said bracing disk at one edge and being adjacent a second bracing disk at the other end.

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