May 28, 1957 J. J. MEYER 2,793,899

KNOB CONSTRUCTION

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Fig. 1.

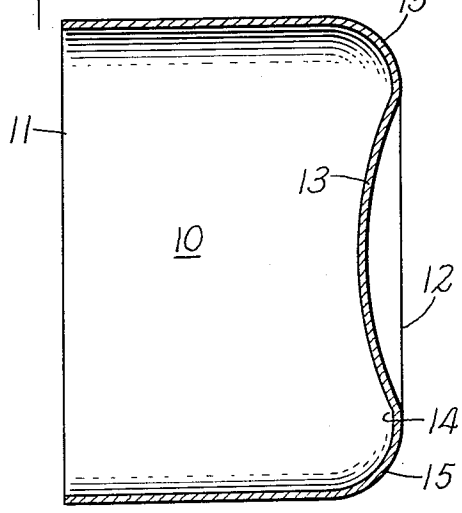


Fig. 2.

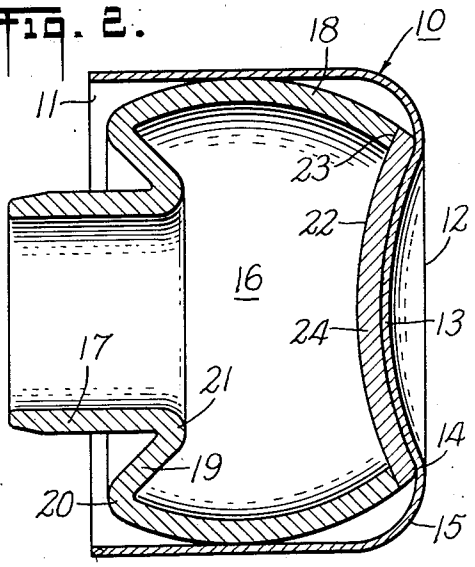


Fig. 3.

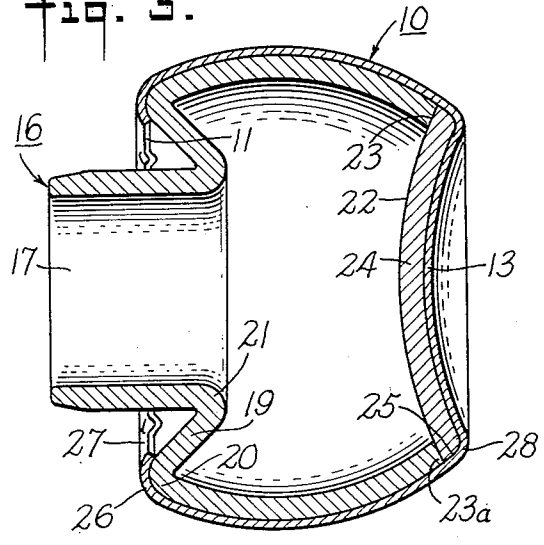
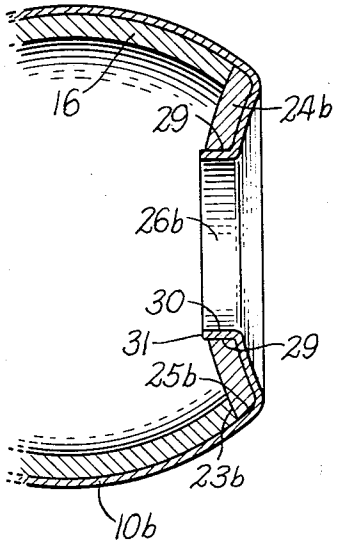


Fig. 4.



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Fig. 5.

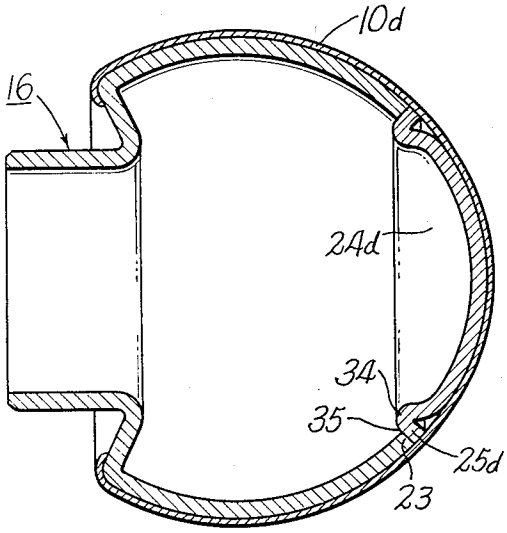


Fig. 6.

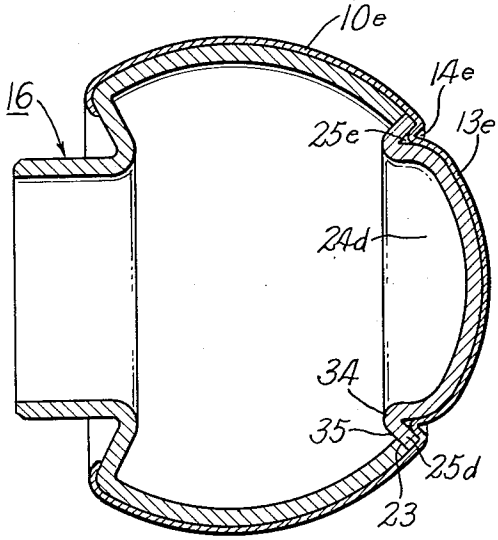


Fig. 7.

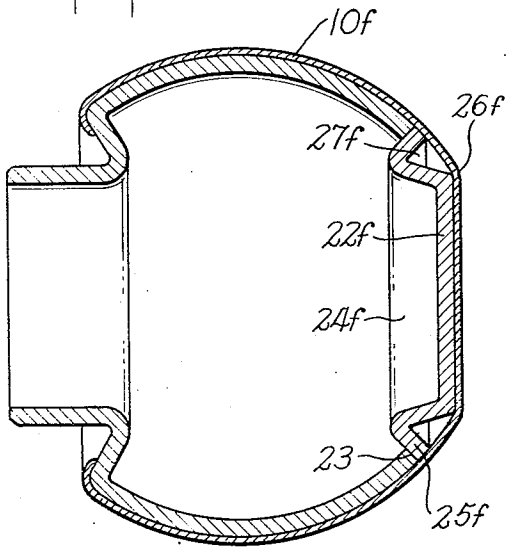
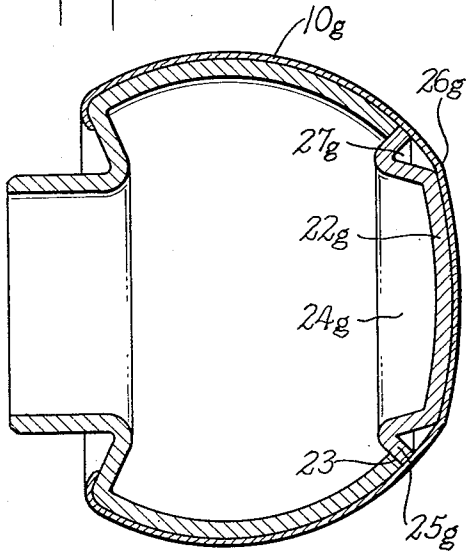


Fig. 8.



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KNOB CONSTRUCTION

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Application March 21, 1956, Serial No. 573,020

8 Claims. (Cl. 292—347)

This invention relates to knob constructions, more particularly to sheet metal knobs.

My invention is concerned with the provision of door knobs, particularly of the type employed in cylindrical locks and has for its object effecting economies in producing such knobs by employing a core of sheet metal tubing which integrates a shank portion and knob portion, and ornamental sheathing of more decorative material, such as sheet brass, bronze, aluminum. More specifically, my invention deals with the provision of a door knob in which a core of relatively heavy gauge sheet iron or steel is employed to provide an integral construction of a shank portion and a knob portion as secured from open-ended tubing, and to sheath such a structure with a thin, decorative sheathing, such as thin gauge sheet brass, aluminum which is capable of being spun and formed around the core, whereby high economies are effected.

Known to me is the provision of procedures for forming door knobs of composite components in which base materials such as cast iron or other inexpensive metal has united to its surface, brass, silver or similar material. Such castings require costly finishing operations such as turning and the like.

Known to me also is the provision of knobs by enveloping a mandrel with a cup-shaped shell which is spun to assume the shape of the mandrel. Such operation is limited to smoothly outlined convex surfaces and relatively heavy gauge sheeting of the enveloping material to secure a bulbous or spheroidal outline, and requires the use of a separately formed costly shank, finished to receive and to be incorporated in the composite structure. The resultant assembly is incapable of providing special shapes, particularly those having shallow or sharp re-entrant angles desirable in producing highly aesthetic shapes.

Accordingly, it is an object of my invention to provide a door knob in which a shank portion and a bulbous portion are integrally joined and formed from tubular stock, open at its opposite ends, and made of base metal, such as cold rolled steel or like malleable sheeting, having a skin of decorative sheet material, conforming to an edge face portion having decorative re-entrant angles, making possible the use of inexpensive decorative sheeting without sacrificing ruggedness, thereby effecting substantial economies in producing these items.

Still more particularly it is an object of my invention to provide a door knob in which the stress receiving body and shank are integrally formed from relatively tubular stock of base sheet metal such as sheet iron, steel of heavy stock formed into simple shapes, with a seat for holding an independently outlining decorative supporting disk which may be held on the seat to outline thereon shapes having re-entrant angles of decorative outline employing thin sheets which respond readily to more complex shaping operations without sacrificing ruggedness.

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 hereon, in which

Figure 1 is a longitudinal, sectional view of a decorative component entering into the production of a knob in accordance with my innvention;

Figure 2 is a partially assembled view of the same, with a core in accordance with my invention;

Figure 3 is a longitudinal, sectional view of the assembly;

Figures 4 to 8 are fragmentary sectional views of different embodiments.

Making reference to the drawing, one element in the preliminary formation of a knob in accordance with my invention resides in the provision of a cup-shaped blank **10** which is generally cylindrical, having a mouth portion **11** and a closed end **12**, preliminarily shaped with a concave front facing surface **13**, peripherally merging into gradual re-entrant folds **14** at the corners **15**. This cup may be made of thin sheeting, such as brass, in the gauge of the magnitude ranging from .015 to .050. Sheeting of this gauge would ordinarily be inadequate to form a door knob or to withstand spinning operations to interpose adjacent the forward face abrupt re-entrant angles to outline an ornamental design.

According to my invention, I first provide a core **16** of steel, initially tubularly formed and including a shank portion **17**, a bulbous portion **18**, integrally joined by a flange **19** forming opposed re-entrant folds **20** and **21** at acute angles. A facing engaging edge **22** provides a rim outlining a slightly dished supporting seat **23**, upon which may be centered by concentricity a concave reinforcing disk **24**. This disk is made of metal of at least the same relative thickness as the core **16**. Co-terminous with the seat **23**, with the parts so assembled, the cup-shaped envelope is brought into covering position, as shown in Figure 2, nesting the initially formed concave front facing surface portion **13** within the concave face of the disk **24**.

In this position, the assembly may be spun to shape the cup-shaped envelope **10** into close contact, conforming to the core **16** adjacent the sharp corner outlined by the perimeter **25** of the disk **24** and the extreme edges of the seat **23** outlining a shoulder **23***a*.

Rearwardly, the edge **11** is spun into enveloping position about the fold **20**, to provide the finished corner fold **26**, leaving a skirt portion **27** enclosed within the fold **21**, the skirt being thereby shielded by the overhang to one side of the fold **26**.

By the foregoing operation, no special care need be exercised in forming the ornamental re-entrant angle or corner **28**, whether notched or smoothly merging, as shown in the preferred example in the corner **28**. No special integration by soldering, brazing or welding need be effected between the disk **24** and body **16**, as the seat **23** centers the disk **24** during the spinning operation, making the enveloping and conforming operations possible by simple spinning action, notwithstanding the fragile nature of the sheeting of which the cup-shaped member **10** is made. The leading edge of the corner **28** of the shell is rigidly supported with sheets of the gauge within the range specified.

While I have shown and described the formation of a knob or handgripping assembly in which the forward end of the tubular core **16** has seated thereon a self-centering concave reinforcing disk of continuous outline, I may, where it is found desirable, alter this to provide a knob which is arranged to carry a key operated assembly or a push button dogging assembly. This, I effect by providing the forward end with a bearing outlining aperture. For this purpose making reference to Figure 4, I may provide the core **16** with a concave disk **24***b* whose axial portion has a boring or circular cutout **29**. This boring or

cutout corresponds substantially to the diameter of a key-operated tumbler assembly. The peripheral edge **25***b* of this disk is aligned substantially with the edge of the core. The convex face is seated upon the dished seat **23***b* to self-center the concave surface of the disk **24***b* thereon. In this position the cup shaped blank **10***b* may be spun into position to conform to the core and seated reinforcing disk in the manner previously described, except that the axial portion of the cup shaped blank is spun inwardly to provide the flange **26***b* and form a facing **30** of the sheeting material for the wall defining the cutout **29**. The peripheral edge **31** may be spun around the inner wall of the cutout of the disk **24***b* further to lock the relatively thin sheeting into engaging position.

As in the prior embodiments, the edge **23***b* of the core **16** forms a self-centering dished seat to permit simple spinning operations to be carried over this reinforcing disk without special interlocking or integration of the disk and core to resist the pressure and force spinning operation in applying the enveloping sheeting of which the cup shaped envelope **10** is constituted.

While I have described and illustrated a knob construction in which the forward end comprises a concave reinforcing disk in that the peripheral edges afford a self-centering surface cooperating with the dished seat to hold the reinforcing disk in seated position without special integration, I may retain some of the benefits of my invention by so forming only the peripheral edge of the reinforcing disk with the dished or self-centering seat and alter the balance of the disk in accordance with some desired ornamental contour. For this purpose I refer to Figures 5 to 8.

In Figure 5, the core **16** is formed as in the first embodiment to provide at its forward edge a dished seat **23** on the extreme, leading edge. The disk **24***d* in this embodiment is convexly formed. Peripherally the edge of the disk **24***d* is formed with an outwardly turned flange **25***d* by outwardly bending the periphery along the folded edge **34** thereby presenting a tapering flange **35** conforming substantially to the seat **23** while bringing the free edge **25***d* substantially coterminous with the outer face of the core **16** in the fully wedged position.

In this form of construction, substantially all of the benefits of the self-centering features previously described are provided to permit the spinning of the sheeting with the thin gauge ornamental sheeting in a manner previously described retaining nonetheless an almost complete spheroidal outline.

With the embodiment illustrated in Figure 5, further ornamental effects may be carried out as illustrated in Figure 6, wherein the cup shaped sheeting **10***e* may be spun at its forward end **13***e* to shape the sheeting of which the cup shaped member **10***e* is made to provide a ring portion **14***e*, spinning the same about the flange **25***d* and into the internal annulus or groove **25***e*. Here again, the general frusto-conically shaped centering flange **25***d*, bearing against the dished seat **23**, wedges the flange **24***d* upon its seat, to resist the spinning stresses, including such as may be involved in forming the indented ring portion **14***e*.

In Figures 7 and 8, the principle of construction more specifically shown in Figures 5 and 6 is further illustrated wherein the disks **24***f* and **24***g*, respectively, are each formed with facing edges **22***f* and **22***g*. In the former, a flat continuous face is illustrated; in the latter, a slight crowning is effected on the central area, each disposed or shaped from the general spheroidal configuration of the main body of the knob outline.

In these forms, the flanges **25***f* and **25***g*, respectively, are arranged with respect to the facing portions **22***f* and **22***g*, defined by the annular edges **26***f* and **26***g* to outline a deep droove or internal annulus **27***f* and **27***g*, not only to increase the area of the frusto-conic section but to provide a more elastic or resilient overhang, thereby more intimately and frictionally wedging the flanges **25***f* and **25***g* of each of the dished seats **23**. The spinning operation of the thin, ornamental sheeting **10***f* and **10***g* from the corresponding cup-shaped blank may proceed as in the prior embodiments.

In general, it will thus be observed that by the construction described relatively heavy gauge sheet iron or steel tubing, open at its opposite ends, may be shaped preliminarily to provide an integral shank portion and a bulbous handgripping portion of general spheroidal outline, and by shaping the free forward end thereof to constrict it, a dished seat or conic section is outlined. This shape of the forward end as described serves to form a supporting shoulder into which or in relation to which a reinforcing disk may be positioned to receive such reinforcing disk with highly desirable results in the further handling to form a laminated construction and lock assembly. The positioning of the disk in this manner causes a centering of this member which, under pressure, particularly in the spinning of a cup of thin, ornamental sheeting, more intimately wedges the reinforcing disk into position to resist the stresses of spinning and shaping, without entailing costly integrating operations to join the disk to the main body of the core or require costly jigs or dies to make the spinning operation possible. Likewise the same core may be used alternately with differently shaped disks and disks which may be used to support a key tumbler or push button assembly and effect great economies in manufacturing assemblies.

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

1. A knob construction for locks or the like comprising a substantially tubular core shaped into an integral shank supporting portion at one end and a substantially spheroidal handgripping portion at the other end, an open edge of the latter outlining a seat angularly rearwardly extended to the axis and shank portion of the core, a closure disk means for said spheroidal portion having a self-centering peripheral edge engaging said seat and cooperating under pressure to be retained axially on said seat and an encasing envelope for said shell and disk to encase the core and disk.

2. A knob construction for locks or the like having a handgripping portion comprising a substantially tubular core of rigid sheet iron shaped into a bulbous handgripping shell portion, terminating in a reduced edge outlining an opening having a dished seat formed across the edge thickness of said sheet, a reinforcing disk as a closure for said opening having a self-centering edge centered on said seat and a cup shaped envelope of thin sheet metal spun into conforming contour of said shell and said disk.

3. A knob construction for locks or the like having a handgripping portion and a shank portion connected to each other and comprising a tubular core of sheet iron extended from the shank and outlining a substantially spheroidal handgripping portion, a small zone of which defining an axially extended cutout, the thickness of the sheet at such cutout outlining a seat which is dished, a reinforcing closure disk for said cutout having a peripheral portion conformingly outlined to said seat and arranged to be wedged on said seat under pressure of encasing an ornamental thin gauged sheet metal envelope about said portion and disk.

4. A knob construction for locks or the like having a handgripping portion and a shank portion connected to each other and comprising a tubular core of sheet iron extended from the shank and outlining a substantially spheroidal handgripping portion, a small zone of which defining an axially extended cutout, the thickness of the sheet at such cutout outlining a seat which is dished, a reinforcing closure disk for said cutout having a peripheral portion conformingly outlined, by a flange

bent on said disk, to said sheet and arranged to be wedged on said seat under pressure of encasing an ornamental thin gauged sheet metal envelope about said portion and disk.

5. A knob construction for locks or the like having a handgripping portion and a shank portion connected to each other and comprising a tubular core of sheet iron extended from the shank and outlining a substantially spheroidal handgripping portion, a small zone of which defining an axially extended cutout, the thickness of the sheet at such cutout outlining a seat which is dished, a reinforcing closure disk for said cutout having a peripheral portion conformingly outlined, by a resilient flange outwardly bent on said disk, to said seat and arranged to be wedged on said seat under pressure of encasing an ornamental thin gauged sheet metal envelope about said portion and disk.

6. A laminated knob construction for locks or the like having a handgripping portion comprising a shell of sheet metal comprising a spheroidal handgripping portion, a segmented zone of which outlines a cutout forwardly on the said portion and a dished seat across the thickness of the shell, a closure disk, a peripheral

edge portion of which is coterminous with the edges of the spheroidal portion outlining the said segmented portion of said handgripping portion and includes a seat contacting edge axially centering the disk and a concentric depressed portion on said disk, and an integral enveloping cup centered by said depressed portion and spun into position encasing said shell and disk.

7. A laminated knob construction for locks or the like in accordance with claim 6, wherein said shell is a tubular sheet iron having an integral shank portion outlining a reentrant acute angle fold, into which edges said enveloping cup is extended.

8. A laminated knob construction for locks or the like in accordance with claim 6, wherein said closure disk has a peripheral flange conforming to said seat and said envelope is spun to conform to said flange.

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