REPLACEMENT CONTROL KNOB

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Filed: Aug. 22, 1972

Appl. No.: 282,680

U.S. Cl.............. 116/124.2 A, 40/331, 74/553, 116/133

Int. Cl................... G05g 1/10

Field of Search.......... 116/124.1, 124.2, 124.3, 116/133, 124.2 A, 124.4; 74/553; 40/331

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ABSTRACT

A replacement control knob for installation on first and second controls having rotary control stems formed with respective index elements disposed at respective first and second relative rotational positions with respect to respective indicators included on such controls. The knob includes a body formed with a passage for receipt of such stems and including an index key cooperating with the index element to index rotational positioning of the body on such stem. The body is formed with a dial mount and a removable dial is received thereon and is shiftable to first and second clocked positions corresponding with the first and second relative rotational positions of the index elements with respect to the indicators. Retainer means is included on the dial for retaining it on the body in the selected first or second clocked position. Thus, by merely selecting the desired clocked position for the dial as it is mounted on the body, the assembled knob may be utilized interchangeably on either the first or second controls.

13 Claims, 11 Drawing Figures
REPLACEMENT CONTROL KNOB

BACKGROUND OF THE INVENTION

1. Field of the Invention

The replacement control knob of the present invention relates to a knob which may conveniently be utilized interchangeably on numerous different controls having various orientations and which may be assembled to accommodate such various orientations.

2. Description of the Prior Art:

When the controls on electrical or gas heating devices fail, making replacement thereof necessary, it is frequently convenient to replace such controls with a different model control which includes a rotatable control stem having a different orientation than the control stem which was replaced. Consequently, in order to retain the same orientation for the new knob, it has been common practice for repairmen to stock numerous different styles of control knobs and to merely select the particular model of knob which will serve to retain the same relative rotational orientation as that of the knob and control which was replaced. Obviously, such a procedure requires stocking of numerous different models of control knobs and, frequently, the particular knob needed is not available in stock.

Knobs have been proposed which include indicia bearing discs mounted on the front thereof, but such discs are not generally rotatable to various selected clocked positions on the knob, thus making shifting thereof to a predetermined orientation for installation of the knob as a replacement knob impractical. Applicant is aware of the following U. S. patents relating to control knobs and various dials having relative rotational members: U.S. Pat Nos.

1,643,290 G. R. Anderson
2,197,356 G. H. B. West
2,394,939 H. Schmid et al.
2,817,451 J. D. Giles et al.
2,834,316 A. Perez et al.
3,151,599 R. J. Livingston

SUMMARY OF THE INVENTION

The replacement knob of the present invention is characterized by a body formed with a shaft-receiving passage having an index element therein for indexing such body in a predetermined position on such shaft. A removable dial is shiftable between first and second angularly rotated positions and is removably mounted on such body so it can conveniently be shifted to the desired position corresponding with the particular installation in which the knob is to serve as a replacement item.

The objects and advantages of the present invention will become apparent from a consideration of the following detailed description when taken in conjunction with the accompanying drawing.

DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a replacement knob embodying the present invention;
FIGS. 2 and 3 are exploded views of the knob shown in FIG. 1 and depicting the dial included in such knob rotated to first and second angular positions with respect to the body of the knob;
FIG. 4 is a perspective view similar to FIG. 1 but depicting the dial rotated with respect to the body to assume the position shown in FIG. 3;
FIG. 5 is a rear view of the replacement knob shown in FIG. 1;
FIG. 6 is a longitudinal sectional view taken along the line 6--6 of FIG. 5;
FIG. 7 is a detail view, in enlarged scale, taken from the circle designated 7 in FIG. 6;
FIG. 8 is a front view of a control for receipt of the replacement knob shown in FIG. 1;
FIG. 9 is a front view similar to FIG. 8 and depicting the knob shown in FIG. 1 installed on a control;
FIG. 10 is a front view of the knob shown in FIG. 1 and depicting installation thereof with the dial rotated to the position shown in FIGS. 3 and 4; and
FIG. 11 is a front view of the replacement knob shown in FIG. 1 but with a different dial mounted thereon.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The replacement control knob of the present invention includes, generally, a circular body 11 formed with a generally cylindrical rearwardly opening shaft-receiving passage 13 (FIGS. 5 and 6) and formed on one side with a flat choral index surface 15. The dial 11 is flared outwardly at its base to form an annular dial mount, generally designated 17, and removably received on such mount is an annular dial, generally designated 19. The dial 19 is formed with turned back peripheral retainer fingers 21 which frictionally engage the mount 17 to hold the dial 19 in position on the body 11. Thus, the replacement control knob may be conveniently installed on a first control 25 which has a rotary stem 27 formed with a flat choral index surface 29 which, when the stem is in the off position, faces away from an indicator mark 31 which indicates the "Off" position of the control. In such an arrangement, the dial 19 is installed on the body 11 with the "Off" indicia oriented on the opposite side of the axis of such knob body from the side on which the flat index surface 15 (FIG. 5) is located. On the other hand, the replacement knob may be utilized with a control 33 having the "Off" indicator 34 on its top side and its stem 35 formed with the flat index surface 37 facing to one side when such stem is in its off position. For this arrangement, the dial 19 will be rotated with respect to the body 11 90° clockwise from the position shown in FIG. 1 to thus position the "Off" indicia adjacent the Off indicator 32 when the stem 35 is in its off position.

Various manufacturers of gas and electrical heating controls use different styles of controls and install such controls in various orientations on their equipment, but the size and shape of the control stems 27 and 35 are somewhat standard. Such control stems are frequently formed with the flat index surfaces 29 and 37 and, consequently, are referred to as "D" stems. It is desirable in the replacement of such controls to maintain the same general orientation for the replacement control knob to thus eliminate the necessity of the operator familiarizing himself with a new orientation for such control knob and eliminating the necessity of relocating any indicator mark such as 31 or 34 inscribed on the equipment housing.

The knob body 11 is conveniently made of Bak-O-Lite and is formed with a central frustum shaped post 41 having axial finger-grasp ribs 43 disposed about the periphery thereof at 45° intervals. Alternate ones of the
gripping ribs 43 have outwardly tapered locating ribs 45 formed at the base thereof.

The knob body 11 flares outwardly at its base to form a plate-like structure formed with an annular outwardly facing support surface 47 defining the dial mount 17. The support surface 47 is surrounded by an annular groove 49, the outer wall of such groove being formed by a ring shaped flange 51 which projects axially outwardly to terminate in an end 53 which projects back beyond the dial support surface 47 a distance approximately equal to the thickness of the dial 19 to thus protect such dial against accidental dislodgement by contact with the edge thereof. The base of the knob body 15 is formed with a through knock-out hole 54 which terminates in the support surface 47 so access can be had to the back side of the dial 19 to dislodge it from the mount 17.

The dial 19 is conveniently formed of aluminum sheet material and is formed in its interior with locating grooves 57 spaced apart at 90° intervals and which receive the locating ribs 45 to positively locate the angular position of such dial with respect to the body 11.

The peripheral outer edge of the dial 19 is turned back slightly to form a rearwardly projecting skirt 59 and the retainer fingers 21 are in the form of tabs projecting axially from such skirt and are dimpled slightly outwardly at 61 to form a smooth, rounded surface for frictionally engaging the interior of the peripheral flange 51 as shown in FIG. 7 and to prevent the free ends of such legs from gouging the flange 51.

The replacement knob shown in the preferred embodiment is intended for use on a commercial oven and includes indicia thereon indicating temperature increments of 50° from 100° to 550°, with an “Off” designation being centered between the 100° and 550° designations. Conveniently, such indicia is silkscreened on the dial.

Referring to FIG. 8, many controls 31 include a mounting plate 65 surrounding the stems 27 for receipt of an annular bezel, generally designated 67, and bearing the “Off” indicator 31. The bezel 67 is formed integrally with receiving slots 69 disposed at 90° spacings and a pair of mounting screws 71 and 73 are provided for mounting such bezel to the mounting plate 65 thus enabling the indicator 31 to be oriented at 90° increments.

In operation, a repairman may carry a number of different controls 25 and 33 in his shop or truck for convenient replacement of malfunctioning controls included on various equipment such as ovens, heaters and coffee urns. The particular equipment being repaired may include an indicator mark similar to the indicator mark 31 on the housing thereof and, in such instances, it is desirable to orient the dial 19 with respect to the body 11 to register the “Off” designation with such indicator when the stem 27 is in its off position. On the other hand, many controls include a mounting plate 65 including threaded bores for receipt of mounting screws 71 and 73, and such plate may conveniently have the bezel 67 included in the knob of present invention mounted thereon with the indicator mark 31 located at the desired clocked position.

Assuming the replacement knob is to be installed on a control 25 which is mounted in the upright position as shown in FIG. 1 and having the indicator mark 31 disposed opposite the direction faced by the chordal index surface 29 when the “D” stem 27 is in its off position, the dial 19 will likewise be oriented on the knob body 11 with its “Off” indicia disposed opposite the chordal surface 15 (FIG. 5) formed in the stem-receiving passage 13. This is accomplished by inserting a tool, such as a pick, through the knock-out hole 54 to dislodge the dial 19 from the mount 17 and rotating such dial to the desired position relative to the body 11. It will be appreciated that since the locating ribs 45 provide for installation of the dial 19 at only angular positions located 90° from one another, such dial will positively be placed in the right orientation with respect to the body 11 by only a rough approximation on the part of the repairman. If the dial 19 is clocked one way or the other from the desired position by an amount less than 90°, the interior of such dial will contact the locating ribs 45 to prevent such dial from nesting securely within the mount 15 as shown in FIG. 6. However, when the dial is properly clocked with respect to the body 11, the locating notches 57 will serve to receive the locating ribs 45 to allow nesting of such dial thus indicating proper location.

When the dial 19 is moved into its nested position shown in FIG. 6, the dimples 61 (FIG. 7) in the retaining legs 21 will engage the interior wall of the peripheral flange 51 to urge the free extremities of such legs slightly inwardly and permitting the outward force provided by the resiliency of such legs to hold such dimples frictionally against the wall of such flange to maintain the dial 19 firmly in position.

The replacement knob may then be fitted over the control stem 27 and the “Off” position of the dial 19 will properly registered with respect to the indicator mark 31.

If, in the repair of another oven, a repairman discovers that the control 33 (FIGS. 4 and 10) mounted therein is of the type that has the indicator mark 34 rotated 90° from the direction faced by the index surface 37 of the “D” stem 35, the dial 19 can be dislodged from the mount 17 by inserting a pick through the knock-out hole 54 and such dial may be reinstalled on the body 11 at an orientation rotated 90° clockwise from the position shown in FIG. 1 to thereby provide for the “Off” designation on such dial being disposed 90° from the direction faced by the index surface 15 in the stem passage 13. Installation of the knob over the control stem 35 will thus result in knob orientation with which the operator has become familiar. The replacement knob shown in FIG. 11 is similar to the knob shown in FIG. 1 except that it includes a different dial 91 mounted on the body 11 and including indicia thereon reading 60, 100, 150, 200° and 250°F for different applications than that for the knob shown in FIG. 1. It will be appreciated that the dial may include temperature readings in degrees centigrade for use in other applications or any other desired indicia for applications in which the knob body 11 may be used.

From the foregoing, it will be apparent that the replacement control knob of the present invention provides a convenient and inexpensive means for fitting a control knob interchangeably on different controls which are oriented at different positions and which are associated with different relative positions of an indicator mark. The assembly of the knob to accomplish this function is relatively foolproof and substantially reduces the inventory that must be stocked by a repairman in order to repair different pieces of equipment having different types of controls thereon.
What is claimed is:

1. A replacement control knob for use with first and second controls having rotary control stems formed with respective index elements disposed at first and second relative rotational positions with respect to respective indicators included on such controls when said stems are in predetermined set positions, said knob comprising:
   a. a body formed with a passage for receipt of the stems;
   b. a key in said passage for engaging the index elements to index said body relative to said stems;
   c. a dial mount on said body;
   d. a dial removably mounted on said mount and including indicia registrable with said indicators and shiftable to first and second clocked positions on said mount corresponding with the first and second relative rotational positions of the respective index elements with respect to the indicators;
   e. retainer means on said dial for removably retaining said dial on said mount in said first and second clocked position whereby said dial may be mounted on said body in said first clocked position to align said indicia with the indicator on said first control when said knob is mounted thereon and said first stem is in said predetermined set position and, alternatively, said dial may be mounted on said body in said second clocked position to align said indicia with the indicator on said second control element when said knob is mounted thereon and said second stem is in said predetermined set position.

2. A replacement control knob as set forth in claim 1 that includes:
   a. locator rib means on said knob and first and second locator groove means on said dial for receiving said rib means when said dial is in said respective first and second rotational positions with respect to said key.

3. A replacement control knob as set forth in claim 1 wherein:
   a. said mount is formed with a peripheral flange for surrounding said dial and projecting therebeyond to guard said dial against accidental dislodgement.

4. A replacement control knob as set forth in claim 1 wherein:
   a. said body is formed with a central post having an enlarged in cross section base forming said mount and a through knock-out hole; and
   b. said dial overlies said base whereby the underside of said dial is accessible through said hole for removal of said dial.

5. A replacement control knob as set forth in claim 1 wherein:
   a. said body is formed with a peripheral channel; and
   b. said retainer includes resilient fingers projecting from said dial for frictional engagement with the wall of said channel.

6. A replacement control knob as set forth in claim 1 wherein:
   a. said body is circular and includes locator rib means; and
   b. said dial means is circular and includes locator groove means disposed every 90° thereabout for selective receipt of said rib means whereby said dial may be fitted on said body at relative rotational orientations of 90°.

7. A replacement control knob as set forth in claim 1 wherein:
   a. said body is formed with a frustum conically shaped post and an enlarged-in-diameter base formed with a peripheral flange; and
   b. said dial is ring-shaped and closely fits between the base of said post and said flange.

8. A replacement control knob as set forth in claim 1 wherein:
   a. said mount is formed with an annular recess defining a dial support surface;
   b. said dial is recessed within said recess to be protected against accidental dislodgement.

9. A replacement control knob as set forth in claim 1 that includes:
   a. a bezel surrounding said knob body and including said indicator thereon;
   b. means for removably mounting said bezel on said controls in various angular positions.

10. A replacement control knob as set forth in claim 2 wherein:
    a. said body is formed with a central cylindrically shaped post having said rib means formed on the arcuate wall thereof; and
    b. said dial is ring-shaped with said groove means formed in the interior thereof.

11. A replacement control knob as set forth in claim 5 wherein:
    a. said resilient fingers are formed with outwardly dimpled projections for engaging said wall of said groove.

12. A replacement control knob as set forth in claim 7 that includes:
    a. axial locator rib means on said post;
    b. first and second internal groove means on the interior of said dial and engageable with said groove means when said dial is in said respective first and second rotational positions.

13. A replacement control knob as set forth in claim 1 that includes:
    a. a second dial including second indicia thereon for selective registration with said indicators.

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