Nov. 6, 1962 R. F. SCALO ETAL 3,061,869

CONTROL KNOBS

Filed July 29, 1959

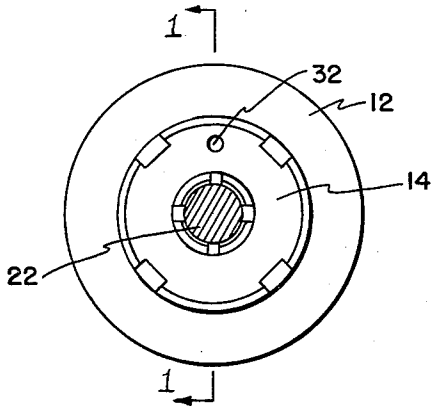


Fig 2

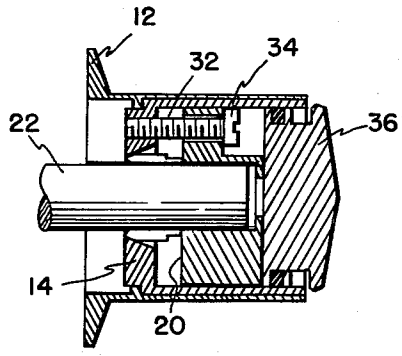


Fig 1

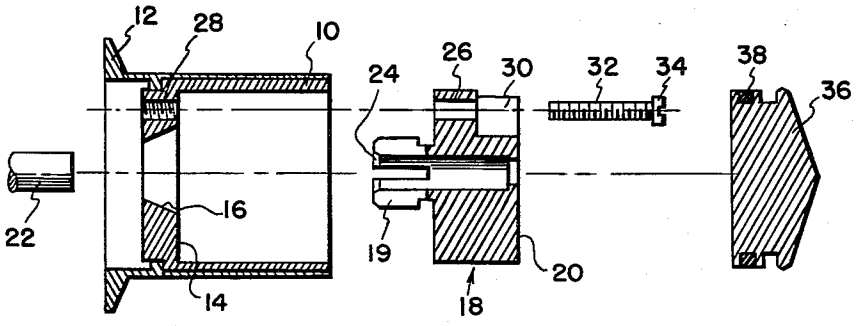


Fig 3

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United States Patent Office

3,061,869
Patented Nov. 6, 1962

3,061,869

CONTROL KNOBS

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Filed July 29, 1959, Ser. No. 830,228
1 Claim. (Cl. 16—121)

This invention relates to control knobs.

The control knobs presently used in electrical and other apparatus have a number of defects. One of the most obvious defects is the fact that such knobs are attached to the controlled shaft in a manner which makes their adjustment difficult without misalignment of the apparatus. As an example, many such knobs utilize a center screw or center nut for tightening the knob onto the shaft. This type of attachment causes inaccuracies as the torque exerted by a screw driver or wrench on a line concentric with the axis of the shaft tends to rotate the shaft. If the operator uses one hand to hold the knob and the other to hold the tightening tool, it will be seen that the risk of movement is still large, especially in the event of slippage. Other types of knobs employ a set screw adjustment whereby a radial screw is tightened against the shaft. This type of fitting often scores the shaft and for best results requires a shaft having at least one flattened side. When a flattened shaft is utilized, the position of the knob circumferentially about the shaft will be seen to be limited. Other disadvantages of the radial set screw are that a relatively long shaft is needed and that accessibility to the screw head is limited.

It is, therefore, a primary object of the present invention to provide a novel control knob which can be tightly affixed to a shaft without causing rotation of the shaft. Other objects are to provide such a knob having a single adjusting screw, capable of attachment to a smooth shaft, readily accessible for adjustment in all positions, easily attachable to a relatively short shaft.

According to the present invention, the above objects are attained by providing a control knob having an internal body member which includes a sleeve split at one end for radial resilience. The sleeve is adapted to accommodate a shaft and on the split end has a first shoulder. A second shoulder is provided on the unsplit portion of the sleeve in spaced axial relationship from the first shoulder. An external body member is adapted to enclose the internal body member and has, on its internal surface, a third shoulder. The third shoulder is adapted to engage the first shoulder of the internal body member. Screw means are then provided in engaging relationship between the third shoulder of the external body member and the shoulder of the internal body member and radially offset from the longitudinal axes thereof.

The above aspects of the invention will appear more clearly from the following description of a typical embodiment with reference to the attached drawings in which:

FIG. 1 is a cross sectional elevational view of a knob according to the present invention taken along the line 1—1 of FIG. 2;

FIG. 2 is a bottom view of the knob shown in FIG. 1; and

FIG. 3 is an exploded view of the knob shown in FIG. 1.

The knob assembly shown in FIGS. 1–3 has a knob body **10** which may be constructed of any suitable material such as metal. The body member shown is enclosed in an outer skirt member **12**. The skirt member **12** is not a necessary part of the invention but is adapted to provide the external shape and appearance desired. Body **10** is characterized by a shoulder section **14** which has a tapered surface **16**. Inner body **18** comprises essentially a sleeve **24** which is adapted to receive the controlled shaft **22**. Sleeve **24** is split to form radially resilient sections **19**. In the embodiment illustrated, there are four slits provided and there are, therefore, four resilient sections **19**. Inner body element **18** is further characterized by shoulder **20** which slides longitudinally in external body member **10**. Shoulder **20** contains a hole **26** which is untapped and is aligned with a somewhat similar hole **28** in body element **10**. Hole **28**, however, is tapped. Shoulder **20** contains a cut-out portion **30**. The screw **32** extends longitudinally parallel to the major axis of the control knob through holes **26** and **28**. The screw slides loosely in hole **26** but is threaded into hole **28**. The head **34** of screw **32** is contained in recess **30**. A cap **36** is provided for the purpose of enclosing the knob end. This cap may be provided with a compressible washer **38** of rubber, plastic or similar material for retaining the cap in the knob body.

The operation of this knob will be more completely understood by reference to FIG. 1. The knob is slipped over the controlled shaft **22** and placed in any desired longitudinal and circumferential position on the shaft. Screw **32** may then be tightened into threaded hole **28**. As screw **32** is tightened, inner body element **18** is forced inward so that resilient sections **19** are actuated by tapered surface **16** and squeezed against the surface of shaft **22**. It will be noted that in the foregoing operation the screw driver or other driving element employed was offset from the major axis of the control shaft itself so that no torque was exerted which would cause the knob or the shaft to rotate. It will be apparent that the apparatus of the invention is a novel and useful control knob having many uses in industrial control applications.

It is to be understood that the above disclosure is for purposes of illustration only and is not intended to be construed in a limiting sense.

We claim:

A control knob comprising an internal body member comprising a substantially cylindrical sleeve split at one end for radial resilience and adapted to accommodate the end of a shaft, each of the radially resilient sections so formed having on its external surface a circumferential tapered shoulder having a thickness increasing with axial distance from the split end, and a second circumferential shoulder on the unsplit portion of said sleeve in spaced axial relationship from each of said tapered shoulders, said second shoulder defining a single unthreaded hole parallel to the longitudinal axis of said sleeve and displaced therefrom a distance equal to at least the largest radius of said tapered shoulders; a substantially cylindrical external body member adapted to enclose said internal body member, in slidable relationship with the second shoulder thereof, and having at the shaft-receiving end of its internal surface a single circumferential third

shoulder having an internally tapered surface adapted to fit the shoulders of said resilient sections, said third shoulder defining a tapped hole in axial alignment with the hole defined by said second shoulder, the non-shaft-receiving end of said external body member extending beyond and substantially completely enclosing said internal body member; single screw means having a head larger than the untapped hole and a shank passing through said untapped hole and in threaded engagement with said tapped hole; and removable cap means positionable over the open end of said external body member.

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