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MICROMETER WITH ADJUSTABLE BARREL SLEEVE

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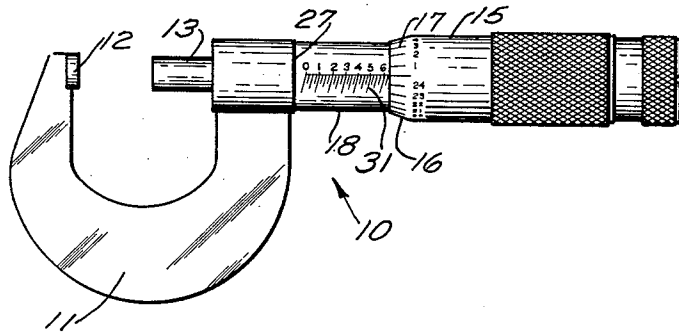


FIG. 1

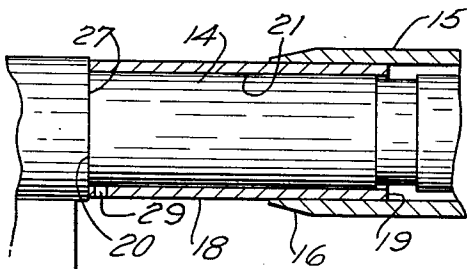


FIG. 2

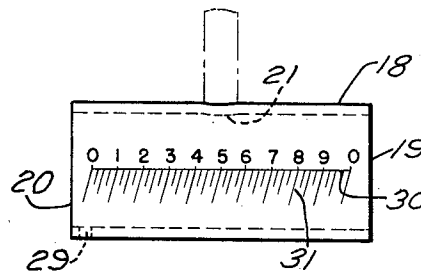


FIG. 3

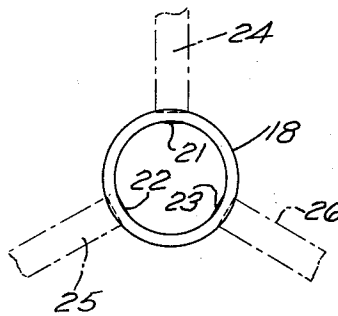


FIG. 4



FIG. 5

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MICROMETER WITH ADJUSTABLE BARREL SLEEVE

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This invention relates to a micrometer.

In the use of a micrometer measurement is obtained by the distance between an anvil and the end of a spindle which is rotated to move toward and from the anvil. These two parts, during their engagement of the article to be measured, are usually moved along the part to be measured with some frictional engagement, and in time the engaging surfaces wear and some adjustment is needed for compensating for the amount of wear. Such compensation has taken various forms, such for instance as the adjustment of the anvil, while in other cases the calibrated indicia markings have been adjusted. In this invention the adjustment is made by the movement of the calibrated markings.

One of the objects of this invention is to provide a sleeve on the barrel part of the micrometer with indicating or marking indicia carried on this sleeve with a means to adjust the sleeve to compensate for wear of the engaging surfaces of the micrometer.

Another object of this invention is to provide a sleeve which will frictionally engage the barrel in such a way that its outer surface will maintain concentricity.

Another object of the invention is to provide for a frictional engagement while leaving the ends of the sleeve truly circular for easy assembling of the sleeve on the barrel.

Another object of the invention is to provide an arrangement for frictional engagement between the sleeve and the barrel which will maintain the sleeve centralized with reference to the barrel.

Another object of the invention is to provide a frictional engagement between the sleeve and the barrel in such manner that they may be readily controlled in manufacturing operations.

Another object of the invention is to provide a frictional fit of the sleeve on the barrel sufficiently secure so that ordinary movement of the thimble or other operations of the micrometer will not cause any change in the relative position of the sleeve and barrel although allowing the sleeve to be intentionally adjusted on the barrel by the use of a particular tool.

With these and other objects in view, the invention consists of certain novel features of construction as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

FIG. 1 is an elevation of the micrometer;

FIG. 2 is a fragmental sectional view showing the sleeve;

FIG. 3 is an elevation of the sleeve alone showing in dotted lines an inwardly deflected portion;

FIG. 4 is an end view of the sleeve showing the deflection at three different locations on the sleeve; and

FIG. 5 is a plan view of a spanner wrench for turning the sleeve.

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In proceeding with this invention, we have provided a sleeve which has a rather close fit with but will be slidable on the barrel of the micrometer. In order to provide a secure frictional fit of this sleeve on the barrel, we have deflected at three locations portions of the sleeve so that they will extend inwardly with a permanent fit and equally spaced circumferentially around the sleeve, thus leaving the ends of the sleeve cylindrical and providing such a slight deflection on this sleeve that when its surface is finished and polished, no deflection is noticeable to the naked eye. These deflections occur about midway between the ends of the sleeve.

With reference to the drawings, 10 designates generally a micrometer having a frame 11 which carries an anvil 12 at one end while a spindle 13 extends through the barrel 14 and is manipulated by the thimble 15 for movement toward and from the anvil 12. The thimble 15 is bevelled at its edge 16 and carries indicia markings 17 usually spaced in twenty-five equal parts about the circumference of this bevelled portion of the thimble. The sleeve 18 embraces the barrel 14 and carries indicia 31 with which the indicia of the thimble register to indicate the spacing between the end of the spindle and the anvil 12.

This sleeve 18 is not axially split but is continuously circular in cross section and has a rather close fit with the barrel 14 and about midway between its ends 19 and 20, it is deflected to provide inwardly extending bulges as at 21 in a plurality of locations preferably equally spaced circumferentially about the sleeve. In this particular case the deflections providing inward bulges which are three in number 21, 22 and 23 are pressed inwardly at 120° apart (see FIG. 4) by three tools 24, 25 and 26 so as to provide somewhat rounded surfaces as seen in FIG. 3 projecting inwardly from a true cylinder which may be sized rather accurately by the use of a mandrel located within the sleeve at the time of this inward pressure. The stock of the sleeve will be such that the bulges will take a permanent set or deformation and will be of such as to provide a circumferential size normally less than the size of the barrel so that they will press firmly on the barrel and yet the barrel may be easily inserted into the truly cylindrical end 20 of the sleeve and then as the end of the barrel reaches the location of the inward bulges 21, 22 and 23, the sleeve may be forced by some pressure onto the barrel so as to abut the shoulder 27 which is between the barrel and the frame. This forcing will slightly move outwardly the bulged portions so that the inherent tension in the stock will firmly press against the barrel and hold the sleeve firmly on the barrel against any movement such as might occur by reason of the manipulation of the thimble or other handling of the micrometer. However, the frictional gripping between the sleeve and the barrel will be such that a spanner wrench such as shown in FIG. 5 may have a prong 28 inserted in a hole 29 in the sleeve adjacent the shoulder 27 and then by applying manual force on this spanner wrench, the sleeve may be rotated so that the line 30 may be adjusted to the zero line of indicia 17 at a point where the spindle and anvil engage under various wearing conditions.

We claim:

1. In a micrometer, a barrel, a sleeve carrying marking indicia and having a continuously circular cross section and of an interior size relative to said barrel to close-

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ly embrace yet slide on the barrel, said sleeve being permanently deflected inwardly at a plurality of equally circumferentially spaced locations providing bulges, the circumferential size of which bulges being less than the size of the barrel, the stock of the sleeve at said bulges being resilient and flexed when the sleeve is in position on the barrel so that the resilience of the stock at said bulges causes the bulges to press against said barrel to normally frictionally hold the sleeve against movement on the barrel and yet provide for rotary movement of the sleeve on the barrel by an applied force whereby to adjust the marking indicia carried by the sleeve.

2. In a micrometer as in claim 1 wherein the inward

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bulges are located spaced from the ends of the sleeve and the ends of the sleeve are cylindrical.

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