

March 28, 1961

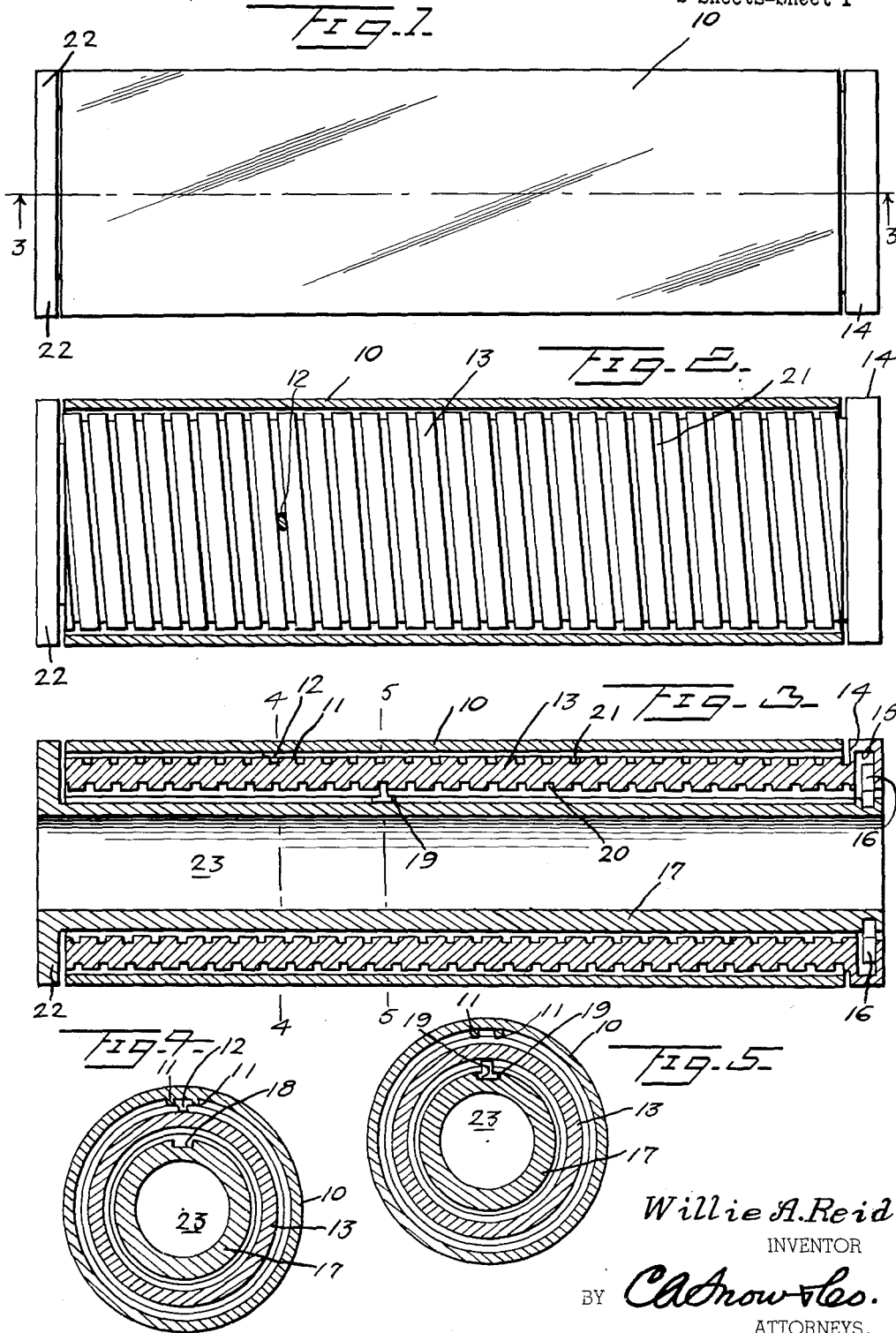
W. A. REID

2,977,044

POCKET CALCULATOR

Filed Oct. 16, 1957

2 Sheets-Sheet 1



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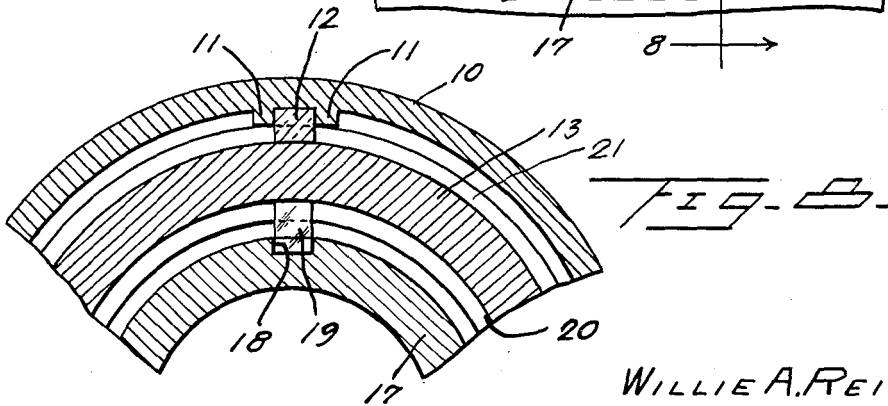
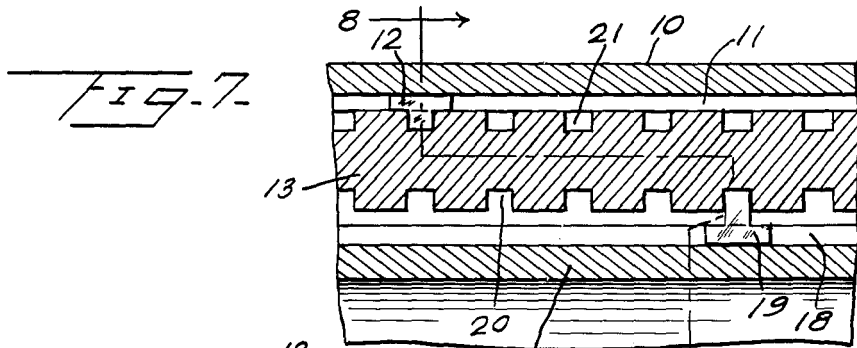
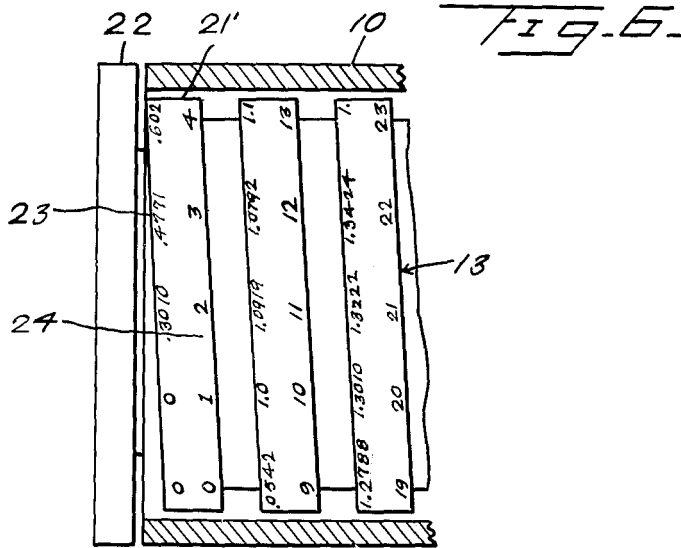
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POCKET CALCULATOR

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2 Sheets-Sheet 2



WILLIE A. REID

INVENTOR

BY *Carroll*

ATTORNEYS.

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2,977,044

POCKET CALCULATOR

Willie A. Reid, South San Francisco, Calif.
(19426 C St., Chowchilla, Calif.)

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5 Claims. (Cl. 235—67)

This invention relates to a pocket calculator, and has as its primary object the provision of a device which is small and compact and which may be readily carried in the pocket, which provides a very accurate means for rapid addition, subtraction, multiplication, and division of numerical quantities.

A further object of the invention is the provision of a device of this character which is extremely accurate, and which may be readily adjusted, to provide a variety of substantially immediate answers to arithmetical problems.

A still further object of the invention is the provision of a device which is characterized by extreme simplicity in construction, and reliability of operation.

Still another object of the invention is the provision of a device of this character provided with a pair of transparent concentric cylinders, with a third concentric cylinder carried interiorly of the other two, and suitable indicia carried by certain of these cylinders, together with slide means movable upon relative rotation of the cylinders to each other, whereby the positioning of the slides movable by one of said cylinders in relation to their associated indicia, may be used to perform mathematical computations.

A further object of this invention is the provision of a device of this character which is sturdy and durable in construction, reliable and efficient in operation, relatively simple and inexpensive to manufacture, simple to utilize.

Still other objects will in part be obvious, and in part be pointed out, and shown in the accompanying drawings, wherein:

Figure 1 is a side elevational view of one form of the device embodying features of the instant invention, the indicia being omitted, and the outer transparent cylinder being shown without its visible underlying components, which will be illustrated more fully in subsequent drawings.

Fig. 2 is a view showing the outer transparent cylinder in section, and showing the outside of the intermediate threaded cylinder.

Fig. 3 is a sectional view, taken substantially along the center line 3—3 of Fig. 1.

Fig. 4 is a sectional view taken substantially along the section line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken substantially along the section line 5—5 of Fig. 3.

Fig. 6 is an enlarged detail view of the left end of the calculator as shown in Fig. 1, with the outer cylinder broken away to show the indicia on the intermediate cylinder.

Fig. 7 is an enlarged fragmentary detail view showing parts of the three cylinders illustrated in Fig. 2 on an enlarged scale; and

Fig. 8 is a detail sectional view taken on the section line 8—8 of Fig. 7.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Having reference now to the drawings in detail, there is shown at 10 a transparent outer cylinder, which is

provided on its inner side with a pair of parallel ridges 11—11 forming a spline, as best shown in Figs. 4 and 5, which spline provides a guide for a transparent T-shaped slide 12, having a hair line at the center thereof. Mounted concentrically within the outer cylinder 10 there is an intermediate cylinder 13, which is also transparent, and is helically threaded both exteriorly and interiorly. The inner threads on this intermediate cylinder 13 are designated by reference numeral 20 and the outer threads by the reference numeral 21. One end of the intermediate cylinder 13 has an enlarged head 14, which extends beyond the end of the outer cylinder 10, in order that the intermediate cylinder 13 may be rotated relative to the outer cylinder 10.

Interiorly, the head 14 contains an annular groove 15, for a retaining ring 16, which is carried by an inner cylinder 17.

The slide 12 guided by the spline 11 is adapted to be engaged by the outer threads 21 of the intermediate cylinder 13, whereby rotation of the head 14 will occasion relative movement of the slide 12 along the length of the outer cylinder 10.

The inner cylinder 17 also has therein a slot or channel 18, in which a slide or key 19 is mounted, which latter is adapted to be engaged by the inner threads 20 of the intermediate cylinder 13. The guideway 18 is normally aligned with the spline 11, so that the two slides 12 and 19 are normally in position to be read along the same line of sight.

The end of inner cylinder 17 opposite the flange 16 carries a circular head 22, which corresponds in diameter to the outer diameter of the sleeve 10.

The slide 19 also carries a hair line, which may be correlated with suitable indicia on either the number 13 or the inner cylinder 17.

The inner cylinder 17 may be open at either or both ends, in order to provide space for data-carrying sheets, or similar articles.

From the foregoing, the operation of the device should now be readily apparent. The inner and outer cylinders 17 and 10, respectively, are normally stationary relative to each other, while the internally and externally threaded intermediate cylinder 13 is rotatable relative to both. Upon holding of the outer cylinder 10, and the disc 22, the enlarged head 14 may be rotated, to rotate the intermediate cylinder 13 and, by virtue of the threaded engagement previously described, move the slide 12 to any desired position.

Correspondingly, by holding the outer cylinder 10 and the head 14 simultaneously, rotation of the disc 22 on the inner cylinder 17 will cause corresponding movement of the slide 19 to any desired location.

The threads of the intermediate cylinder 13 may, of course, be of any desired pitch, but it has been found that four turns per inch are desirable. The calibrations or indicia may also take any desired form, and in a preferred embodiment of the invention have the logarithms of numbers placed on the left side 23 of the thread 21 of the intermediate cylinder 13. A zero is placed as near the disc 22 as possible and the first logarithm is placed one millimeter from the zero and thereafter they are spaced one millimeter apart continuing in a clockwise direction around the intermediate cylinder 13.

The real numbers are placed on the right side 24 of the thread 21 and directly opposite their respective logarithms, as clearly shown in Fig. 6 of the drawings.

In the use and operation of the device, when it is desired to add certain numbers, the enlarged head 14 is held and the disc 22 is rotated until the hair line on the slide 19 is positioned at the zero indicia.

Then the intermediate cylinder 13 and inner cylinder 17 are held simultaneously against rotation, while the transparent cylinder 10 is rotated until the hair line on the slide 12 is positioned at the number to which another number is to be added.

The outer transparent cylinder 10 and the disc 22 are simultaneously held, until the hair line on the slide 19 is at the second number. The figure under the hair line on the slide 12 will then indicate the sum.

In subtracting with the calculator, the hair line on slide 19 is positioned at zero and the hair line on slide 12 is moved over the minuend. Then, with the outer transparent cylinder 10 and the inner cylinder 17 held against rotation, the enlarged head 14 is rotated until the hair line on the slide 19 is at the subtrahend. The difference will be indicated under the hair line on the slide 19.

In the above mentioned operations, the logarithmic numbers will be used for multiplying and dividing, while the real numbers are used in addition and subtraction.

From the foregoing, it will now be seen that there is herein provided an improved pocket calculator, which accomplishes all of the objects of this invention, and others, and one having many advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made in the embodiment hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative and not in a limiting sense.

What I claim as my invention is:

1. In a pocket calculator of the class described, the combination of a transparent outer cylinder having internal longitudinally positioned ridges therein forming a guide spline, an intermediate transparent cylinder threaded externally and internally having pairs of parallel rows of indicia around its outer circumference with each pair comprised by a series of real numbers and a series of aligned logarithmic numbers positioned within the outer cylinder, an indicating slide movable in the guide spline on the outer cylinder and engaged between the external threads on the intermediate cylinder, an inner cylinder having a longitudinally positioned guide in its external surface positioned within the intermediate cylinder, a second slide positioned in said guide in the inner cylinder and engaged between the internal threads on the intermediate cylinder, and means for rotating each of said cylinders relatively to the others to translate the relative positions of said slides and move the latter into aligned positions with said rows of indicia.

2. In a pocket calculator of the class described, the combination of a transparent outer cylinder having internal longitudinally positioned ridges therein forming a guide spline, an intermediate transparent cylinder threaded externally and internally having pairs of parallel rows of indicia around its outer circumference with each pair comprised by a series of real numbers and a series of logarithmic numbers positioned within the first cylinder, an indicating slide movable in the guide spline on the outer cylinder and engaged between the external threads on the intermediate cylinder, an inner cylinder having a longitudinally positioned guide in its external surface positioned within said intermediate cylinder, a second slide positioned in said guide in the inner cylinder and engaged between the internal threads on the intermediate cylinder, an enlarged head on said intermediate cylinder positioned beyond one end of the outer cylinder for rotating the intermediate cylinder relatively to the outer cylinder to translate the second slide with respect to the first slide and align said second slide with said rows of indicia, and a disc on said inner cylinder positioned beyond the other end of the outer cylinder for rotating the said inner cylinder relatively to the outer and intermediate cylinders to translate the first slide with respect to the second slide and align said first slide with said rows of indicia.

3. In a pocket calculator of the class described, the combination of a transparent outer cylinder having internal longitudinally positioned ridges therein forming a guide spline, an intermediate transparent cylinder threaded externally and internally having pairs of parallel rows of indicia around its outer circumference with each pair comprised by a series of real numbers and a series of longitudinally aligned logarithmic numbers positioned within the first cylinder, an indicating slide movable in the guide spline on the outer cylinder and engaged between the external threads on the intermediate cylinder, an inner cylinder having a longitudinally positioned guide in its external surface positioned within said intermediate cylinder, a second slide positioned in said guide in the inner cylinder and engaged between the internal threads on the intermediate cylinder, an enlarged head having a diameter approximately equal to that of the outer cylinder on said intermediate cylinder positioned beyond and adjacent one end of the outer cylinder for rotating the intermediate cylinder relatively to the outer cylinder to translate the second slide with respect to the first slide and align said second slide with said rows of indicia, and a disc also having a diameter approximately equal to that of the outer cylinder on said inner cylinder positioned beyond and adjacent the other end of the outer cylinder for rotating the said inner cylinder relatively to the outer and intermediate cylinders to translate the first slide with respect to the second slide and align said first slide with said rows of indicia.

4. In a pocket calculator of the class described, the combination of a transparent outer cylinder having internal longitudinally positioned ridges therein forming a guide spline, an intermediate transparent cylinder threaded externally and internally having pairs of parallel rows of indicia around its outer circumference with each pair comprised by a series of real numbers and a series of longitudinally aligned logarithmic numbers positioned within the first cylinder, a transparent indicating slide having a hair line therein positioned in said guide in the inner cylinder and engaged between the internal threads on the intermediate cylinder, an enlarged head having a diameter approximately equal to that of the outer cylinder on said intermediate cylinder positioned beyond and adjacent one end of the outer cylinder for rotating the intermediate cylinder relatively to the outer cylinder to translate the second slide with respect to the first slide and align the hair line on said second slide with said rows of indicia, and a disc also having a diameter approximately equal to that of the outer cylinder on said inner cylinder positioned beyond and adjacent the other end of the outer cylinder for rotating said inner cylinder relatively to the outer and intermediate cylinders to translate the first slide with respect to the second slide and align the hair line on said first slide with said rows of indicia.

5. In a pocket calculator of the class described, the combination of a transparent outer cylinder having internal longitudinal ridges therein forming a guide spline, an intermediate transparent cylinder threaded externally and internally having pairs of parallel rows of indicia around its outer circumference with each pair comprised by a series of real numbers and a series of aligned logarithmic numbers positioned within the first cylinder, an indicating slide movable in the guide spline on the outer cylinder and engaged between the external threads on the intermediate cylinder, an inner cylinder having a central bore serving as a receptacle for carrying associated data sheets or the like and having a longitudinally positioned guide in its external surface positioned within said intermediate cylinder, a second slide positioned in said guide in the inner cylinder and engaged between the internal threads on the intermediate cylinder, an enlarged head having a diameter approximately equal to that of the outer cylinder on said intermediate cylinder positioned beyond and adjacent one end of the outer cylinder for rotating the intermediate cylinder relatively to the

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outer cylinder to translate the second slide with respect to the first slide and align said second slide with said rows of indicia, and a disc also having a diameter approximately equal to that of the outer cylinder on said inner cylinder positioned beyond and adjacent the other end of the outer cylinder for rotating the said inner cylinder relatively to the outer and intermediate cylinders to translate the first slide with respect to the second slide and align said first slide with said rows of indicia.

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