March 3, 1964 R. L. MADRY 3,123,291

RESISTOR COLOR DECODER

Filed May 18, 1962

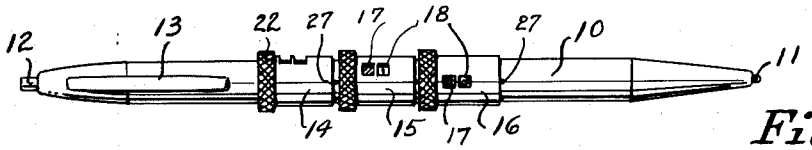


Fig. 8

Fig. 1

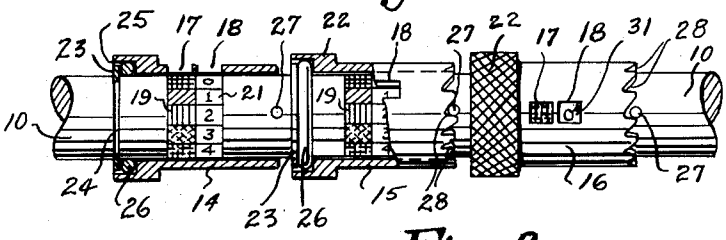


Fig. 2

	19'	21'	31'
Black		0	
Brown		1	0'
Red		2	0^2
Orange		3	0^3
Yellow		4	0^4
Green		5	0^5
Blue		6	0^6
Violet		7	0^7
Gray		8	0^8
White		9	0^9

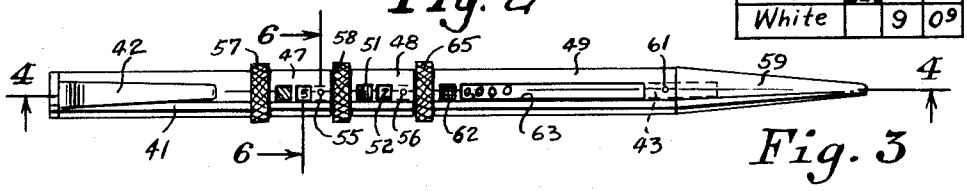


Fig. 3

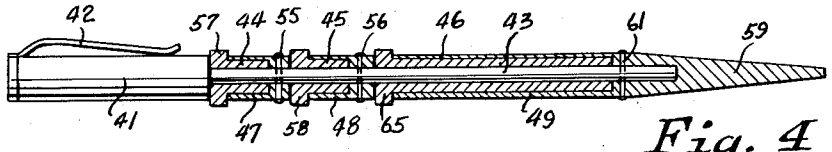


Fig. 4

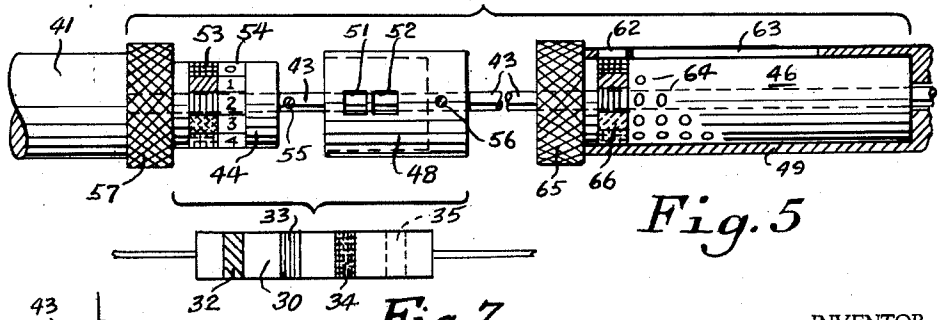


Fig. 5

Fig. 7

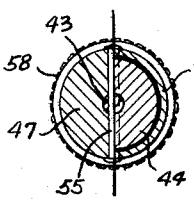


Fig. 6

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United States Patent Office 3,123,291
Patented Mar. 3, 1964

3,123,291

RESISTOR COLOR DECODER

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Filed May 18, 1962, Ser. No. 195,722
2 Claims. (Cl. 235—87)

This invention relates to a resistor color decoder.

It is the principal object of the present invention to provide a simple means for decoding the resistance of resistors from their color markings.

It is another object of the invention to provide a color decoder for readily determining the resistance of resistors from their color markings which is in the form of a pencil or pen that can be carried in the pocket and retained therein by its pencil clip.

It is still another object of the invention to provide a resistor color decoder in the form of a pencil having a plurality of members arranged on the body of the pencil that can be turned thereover and relative to each other to determine the digits and zero multipliers for the different colors on the resistors whereupon the correct resistance in hundreds and thousands can be readily decoded.

It is still another object of the invention to provide a color decoder for resistors said decoder having turnable members on a pencil like body with means for retaining the turnable members in their adjusted positions and locked against displacement while turning the other members to provide independent control of several members to prevent them from slipping.

It is a further object of the invention to provide color decoder for resistors in which the number of zeros that would be added to the digits for a determination of the total digits can be obtained as simply as the prefixed digits are determined.

Other objects of the invention are to provide a color decoder for resistors having the above objects in mind, which is of simple construction, has a minimum number of parts, easy to assemble and inexpensive to manufacture, compact, always ready and handy for use, efficient and effective.

For a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which

FIGURE 1 is a longitudinal view of the decoder pen constructed according to one form of this invention,

FIG. 2 is an enlarged fragmentary longitudinal view of the pen showing the decoding sleeves thereof,

FIG. 3 is a longitudinal view of a color decoder constructed according to another form of the invention in which the full number of zeros are shown,

FIG. 4 is a longitudinal sectional view of the color decoder shown in FIG. 3, as viewed generally on line 4—4 thereof,

FIG. 5 is an enlarged collective and fragmentary view of certain of the parts used in connection with the decoder shown in FIG. 3,

FIG. 6 is an enlarged cross sectional view taken generally on line 6—6 of FIG. 3,

FIG. 7 is a longitudinal view of an axial lead color coded resistor from which the resistance in ohms is to be determined by the present color decoder, and

FIG. 8 is a color chart showing the colors and the corresponding digits therefor.

Referring now to FIGS. 1 and 2, **10** represents a ball point pen having a ball point **11**, a press button **12** to depress and retract the ball point **11** and a pocket clip **13**. This pen has a cylindrical surface upon which there is rotatably placed an arrangement of three sleeves **14**, **15** and **16** which can be turned upon the pen surface and relative to each other. Each of the sleeves is provided with two

longitudinally-aligned and closely spaced windows **17** and **18** that are adapted to overlie respectively the ring of ten different color areas **19** on the pen surface and an adjacent ring **21** of corresponding numerals numbering from zero to nine. Each sleeve has an enlarged diameter knurled portion **22** by which the sleeve can be easily turned. It is held against axial displacement upon the pen in one direction by a flat ring retainer **23** that lies in a groove **24** provided in the pen surface. This retainer lies within an annular recess **25** in the adjacent end of the knurled portion **22** of the sleeve and is adapted to retain a spring ring **26** that presses against the inner face of the annular recess **25** of the sleeve to hold the opposite end of the sleeve against a stop pin **27** extending from the surface of the pen. The opposite end of the sleeve has a series of ten saw tooth notches **28** biased to permit turning of the sleeve in one direction over the pin **27** in order that the sleeve will be held against rotation when it has been adjusted to the color appearing through the window opening that has been taken from a resistor **30**, FIG. 7. Each of the sleeves **14**, **15** and **16** is of similar construction. The last sleeve **16**, however, has its window **18** overlying a ring **31** of zeros with an indication in one corner as to the number of zeros that is to be added to the digits appearing from the windows **18** of the sleeves **14** and **15**.

According to EIA standards the resistance of resistors of the axial lead type shown in FIG. 7 or any other types of resistors are given by color bands on them from which the numerical value resistors in ohms may be determined. There are three bands **32**, **33** and **34** which may be colored respectively red, green and yellow. Also there may be an alternative fourth band **35** that is sometimes used to indicate tolerances and with its absence of any color or white, tolerance is plus or minus twenty percent, with a silver color being used the tolerance is plus or minus ten percent and with a gold color being used the tolerance is plus or minus five percent.

For the first two bands of the resistor **30**, the sleeves **14** and **15** are turned. FIGURE 8 illustrates a chart. It does not purport to show the arrangements of either species as they actually appear on the decoder bodies, but only the relation of the several denominations to each other. Thus, the band **19'** corresponds to the bands **19**; the band **21'** corresponds to the bands **21**; and the band **31'** corresponds to the bands **31**. The colors as best seen from the chart in FIG. 8 represent the digits as follows: black is zero, brown is 1, red is 2, orange is 3, yellow is 4, green is 5, blue is 6, violet is 7, gray is 8 and white is 9. When the first sleeve **14** is turned to the green color of the first band **32**, for example, the digit 5 would appear in the window **18** of the sleeve **14**; when the second sleeve **15** is turned to the red color of the second band **33** of the resistor, the digit **2** will appear. When the third sleeve **16** is turned to the yellow color of the band **34** of the resistor, the zero to the fourth power will appear in the window **18** of the last sleeve **16**. From the fourth band **35** the colors white, silver or gold can be noted and if there is white or no color showing in this band, the indication of the color given above will be noted and as in this case no color showing the tolerance is plus or minus twenty percent. As seen in FIG. 3, the digits 5 and 2 are shown and the number of zeros to be added are four, the resistance of the resistor will be 520,000 ohms. If the resistor **30** has the color bands, green, red and black, and the sleeves **14**, **15** and **16** are turned to these colors, then appear in windows **17** only the digits **52**, and black on referring to the chart of FIGURE 8 means no zero at all, thus the resistance that is determined is only 52 ohms. The decoder can be used in reverse with the settings of the sleeves to the numerals

where the resistance in ohms which is desired in a resistor is known, the color combination appearing on the decoder enables the proper resistor to be quickly selected. In other words a numerical value can be converted to the color code.

It will be apparent that a fourth sleeve can be used to designate the data taken from the fourth band 35 but since only two or three colors are involved this would unduly add to the expense of constructing the decoder for something that is not too difficult to remember. The color for the tolerances simply could be made as a showing on any one of the sleeves or upon the surface of the pen and made readily available and by this means the tolerance corresponding to the coloring of the fourth band 35 can be readily determined.

The saw tooth notches 28 permit the sleeve to be spun easily to the color and numeral in one direction over the inclined surface of each notch and each axial face will positively prevent the turning of the sleeve in the opposite direction. The round spring 26 acting against the ring retainer 23 of the pen adequately holds the sleeve with its notches against the pin 27 so there is little chance of the sleeve being turned further when it has been turned to the desired color. There is still space upon the pencil and upon the sleeve on which indicia or advertising can be placed.

Referring now particularly to the form of the invention shown in FIGS. 3–6, 41 represents a cylindrical body having pocket clip 42 and an elongated reduced diameter core portion 43 on which turn sleeves 44, 45 and 46 are rotatably mounted. Window sleeves 47, 48 and 49 are fixedly mounted relative to sleeves 44, 45 and 46. Each of the window sleeves 47 and 48 have color and numeral openings 51 and 52, through which rings 53 and 54 of color designations and numbers on the turn sleeves 44 and 45 will appear. The sleeves 47 and 48 are respectively secured to the elongated core 43 of the cylindrical body 41 by respective pins 55 and 56 to hold the turn sleeves 44 and 45 respectively operating thereon against turning and axial displacement. The turn sleeves 44 and 45 respectively have knurled turning portions 57 and 58 to facilitate the turning of these sleeves to the colors of the respective bands 32 and 33 of the resistor 30.

The window sleeve 49 is longer than the sleeves 47 and 48 and has a tapered end portion 59 resembling a pencil point to facilitate the insertion of the decoder into the pocket in which it is to be retained by the clip 42. This sleeve 49 is held against turning and forward displacement by a pin 61 extended through the forward end of the body core 43. This sleeve 49 has a color window 62 corresponding to the windows 51 of the sleeves 47 and 48 and through which colors of the ring 66 on the turn sleeve 46 will appear.

The sleeve 49 has an elongated window opening 63 lying opposite the color window 62 through which zeros 64 will appear. The number of zeros that will appear correspond to the color of the ring 66 on the turn sleeve 46. All of the zeros for the ohms resistance will appear and the resistance for hundreds and thousands will be read directly from this form of the decoder. The elongated turn sleeve 46 has a knurled turning portion 65.

In use this pencil construction is according to the form

of the invention, will be operated and the readings taken in the same manner as above described for the first form of the invention. The sleeves 44, 45 and 46 are turned to the respective colors 32, 33 and 34 appearing on the resistor 30 shown in FIG. 7. Thereafter the reading can be taken from the digit windows 51, 52 and 63 of the window sleeves 47, 48 and 49.

It should now be apparent that there has been provided a simple color decoder for determining the resistances of resistors bearing the standard color bands.

While various changes may be made in the detailed construction, it should be understood that such changes shall be within the spirit and scope of the present invention as hereinafter claimed.

What is claimed is:

1. A color decoding device for determining the resistance of resistors which are coded by a number of colored bands or the like thereon, comprising an elongated cylindrical body, a plurality of turnable sleeves turnably mounted on said body in end-to-end relation, said body having a plurality of pairs of circumferential rings fixed thereon, there being a pair of rings beneath each sleeve, one ring of each pair comprising a circumferential series of different color denominations corresponding to band colors of coded resistors, the other ring of each pair comprising a circumferential series of digits in axial alignment with said color denominations, each sleeve being formed with a pair of axially aligned windows for respectively viewing a single color denomination and a single digit, means for separately turning each sleeve so that the color of the bands of a coded resistor are displayed through the associated windows of said sleeves, and said simultaneously displayed digits forming a number corresponding to the resistance of the resistor in question, and each of said sleeves having at one end thereof a plurality of notches, a pin on the cylindrical body adapted to be received by the notches, spring biasing means reacting between the cylindrical body and each of the sleeves to maintain the notches normally in engagement with the pins and the sleeve in its adjusted position.

2. A color decoding pencil-like device as defined in claim 1, and said spring biasing means including the provision of grooves in the cylindrical body, a retaining ring for each sleeve in each groove, an annular recess in the opposite end of the sleeve from the notches, a round spring ring in the annular recess reacting against the retaining ring and upon the inner end of the annular recess.

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