# United States Patent

**Maue**

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[54] **TIMEPIECE FOR IDENTIFYING TIME BY COLOR**


[72] Inventor: **Marilyn J. Maue,** 20 Melwex Street, Belleville, N.J. 07109



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**Related U.S. Application Data**

[63] Continuation-in-part of Ser. No. 696,940, Jan. 10, 1968, Pat. No. 3,616,643.

[52] **U.S. Cl.** .....**58/126 E,** 58/2, 58/127

[51] **Int. Cl.** .....**G04b 19/00**

[58] **Field of Search** .58/127 R, 126 R, 126 E, 125 R, 58/125 C, 2, 58, 1 R



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*Primary Examiner*—Richard B. Wilkinson
*Assistant Examiner*—Stanley A. Wal



[57] **ABSTRACT**

A timepiece is provided by having a cylindrical color carrying member on which is coded a plurality of distinguishable color areas in uniform sections around its circumference, said color areas representing uniform units of time within a time period; a separate and second plurality of sections displayed on the circumference of the cylindrical member to denote a second period of time; an independent reference indicator means adapted to indicate successively each of the color areas and each of the second plurality of sections; and timepiece driving means to impart relative rotation between said indicator means and said cylindrical color carrying member so that each section of the cylindrical member is indicated successively within the desired time period of a plurality of hours, such as a 12 or 24 hour period. At least one period of time, such as the hours of a day or minutes of one hour, is displayed by distinguishable colors while the second time period is displayed by any convenient means of denoting a division, such as markings, numerals, a separate code of colors which are distinguishable from the first color code, a separate code of distinguishable color patterns, colored or non-colored bodies, etc.


**22 Claims, 6 Drawing Figures**

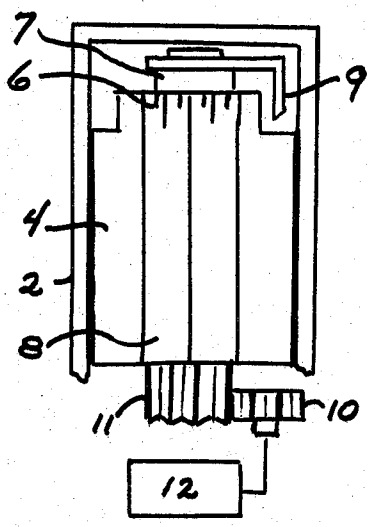


FIG. 1

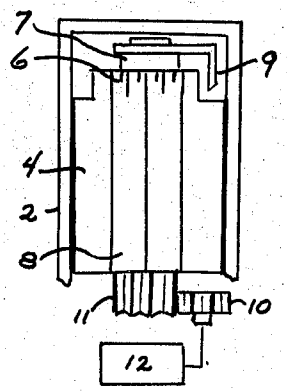



FIG. 2

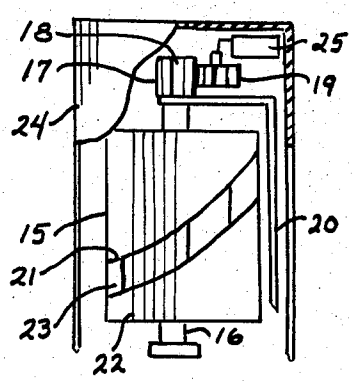



FIG. 3

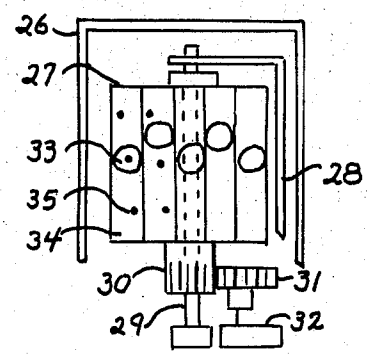



FIG. 4

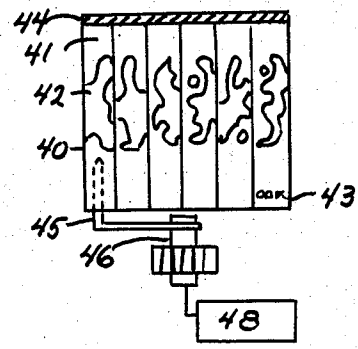



FIG. 5

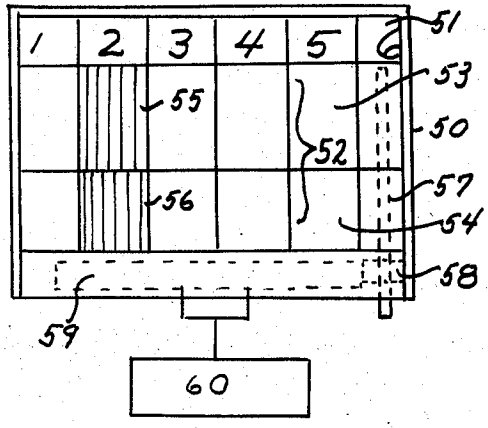
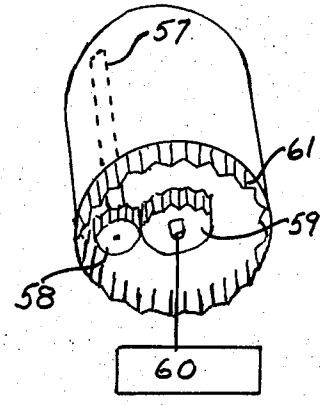



FIG. 5A




INVENTOR.
MARILYN J. MAUE

# TIMEPIECE FOR IDENTIFYING TIME BY COLOR

The present invention relates to timepieces which include a cylindrical color carrying member and separate reference means for the indication of time, and is a continuation-in-part of my prior copending application, Ser. No. 696,940, filed on Jan. 10, 1968, now U.S. Pat. No. 3,616,643.

In my prior copending application, there are disclosed various timepieces in which a cylindrical member carrying distinguishable colored sections, or a reference means carried by a casing enclosing the cylindrical member, is rotated at a uniform rate for successively identifying each colored section of the cylindrical member which, in turn, provides an indication of time. The present application is directed to an aspect of the prior invention in which a separate reference indicator means is mounted so as to indicate each of the color sections of the cylindrical member successively within a predetermined time period, such as for example the hours of a day or the minute intervals of an hour and another time period which is not displayed by distinguishable colors, is indicated by numerals, markings or stones within each section of the distinguishable color areas.

The timepiece of the present invention can be employed as a watch pin, watch fob, wrist watch or can be mounted as a wall clock or positioned on a base as a table clock. A preferred embodiment of the invention includes a transparent casing which encloses at least the reference indicator means as protection against dirt and moisture. The casing may be the cylindrical color carrying member, for example, when the reference indicator means is rotated and enclosed within a hollow cylindrical member, or the casing may be a separate member which encloses the cylindrical member and the reference indicator means and may be extended to also enclose the driving mechanism which is a standard timepiece driving mechanism and which rotates either the reference indicator means or the cylindrical color carrying member.

The invention will be more fully understood from the description of the following drawings which illustrate particular embodiments of the invention but which are not to be construed as limiting to the scope thereof.

FIG. 1 is a partial side elevation which shows a structure wherein the reference indicator means is rotatable and overlays a portion of the display area of a stationary cylindrical color carrying member;

FIG. 2 is a partial side elevation also illustrating a rotatable reference indicator means; however, in this embodiment, the indicator traverses the longitudinal area of each color section in the display area of the cylindrical member;

FIG. 3 is a partial side elevation wherein the reference indicator means is stationary while the cylindrical color carrying member is rotated so as to position each of the color sections successively at the stationary reference means;

FIG. 4 is a partial side elevation illustrating a rotatable reference indicator means enclosed by a hollow, transparent cylindrical color carrying member. In this embodiment, the stationary cylindrical color carrying member is the casing of the assembly and the reference indicator means terminates outside of the display area of the cylindrical member;



FIG. 5 is a partial side elevation which shows a segmented color display area on the surface of the cylindrical color carrying member which is fixedly mounted in the timepiece; and

FIG. 5A is a perspective view illustrating the lower inside circumference of the cylindrical color carrying member shown in FIG. 5.

Referring more particularly to the drawings, the timepiece shown in FIG. 1 includes a transparent casing 2, a cylindrical color carrying member 4 which is recessed at one end and which carries three uniformly spaced markings 6 disposed laterally across each color section 8. Color sections 8 are bands longitudinally disposed on the outer surface of the cylinder including the recessed portion. The cylindrical member is fixedly mounted so that its surface which is not depressed abuts the inner wall of the casing. The cylindrical member possesses a bore through its longitudinal axis in which rotatable shaft 7 carrying reference means 9 is positioned in spaced relationship thereto. The reference means is similar to the lance of an ordinary timepiece, except that it is perpendicularly bent to extend over the recessed portion of the cylindrical member so that each color section and each marking of the color sections are positioned below the reference means as it is rotated around the recessed display area of the cylindrical member. Shaft 7, carrying reference means 9 at one end and passing through the bore of the cylinder, is geared at its opposite end 11 to engage gear wheel 10 which, in turn, is connected to standard timepiece driving mechanism 12. In this embodiment, each of the 12 color sections represents one hour of a 12 hour time period. Each marking represents a 15 minute interval of an hour.

It is to be understood that, in the accompanying drawings, the colored area of each color section of the cylinder can be of any shape or pattern and can occupy the entire longitudinal surface of the cylinder or any longitudinal portion thereof. The markings can be uniformly spaced lines, bars, numerals, etc. or stones, pieces of glass or plastic which are positioned diagonally or horizontally across the color sections of the cylinder.

FIG. 2 comprises transparent casing 14 in which cylindrical member 15 is positioned in spaced relation to the inner wall of the casing and is integrally mounted on the base of the casing. The top central portion of the cylinder carries a shaft 16 on which is fitted rotatable sleeve 17 which is geared at 18 to engage gear wheel 19 driven by the hour driving mechanism of a standard timepiece as described in my copending application, Ser. No. 696,940. Reference indicator 20, substantially the same as in FIG. 1, except that it extends almost the entire length of the cylinder, is fixedly mounted on sleeve 17 so that it is caused to make one complete rotation at a uniform rate within the period of 12 hours around the longitudinal surface of the cylinder and within the inner wall of the casing. Casing 14 is joined to opaque, hollow head portion 24 which encloses sleeve 17 and driving mechanism 25. A spiral band 21 is disposed around the surface of cylinder 15 and represents the display area in which the distinguishable colors of uniform color sections 23 are coded. The circumference of the cylinder is longitudinally striated and each color section of the cylinder is divided by 5

lines 22, so that as reference means 20 is rotated around the cylinder and aligned with the color sections and lines of each section, the hour is indicated by the distinguishable color and each 10 minute interval of the hour is indicated by the line traversing each section.

FIG. 3 comprises casing 26 which encloses rotatable cylindrical color carrying member 27 and stationary reference indicator means 28. The reference means, substantially the same as in the preceding figures, is integrally mounted on stationary shaft 29 which passes through sleeve 30 on which cylinder 27 is fixedly secured. The lower portion of sleeve 30 which extends below the cylinder is geared to engage gear wheel 31 which, in turn, is actuated by a standard timepiece driving mechanism 32 which normally drives the hour hand of an ordinary timepiece. In this manner, cylinder 27 is caused to make one complete rotation within each 12 hour period. Twelve substantially circular areas of distinguishable colors 33, representing hours of a 12 hour period, are coded in 12 uniform sections 34 disposed around the circumference of the cylinder. In this embodiment, each section is divided by the lateral placement of three stones 35 which represent 15 minute intervals of the hour. Accordingly, as the cylinder is rotated, the color sections and stones are successively positioned at the reference means for proper indication of the hour and quarter of the hour.

FIG. 4 comprises a hollow, transparent, cylindrical color carrying member 40 on which is coded in uniform sections 41 twelve color areas 42 of varying design, each being of a distinguishable color or color patterns and each representing an hour of a 12 hour period. Around the lower portion of the cylinder, three bodies of distinguishable shape 43 are embedded in the cylinder matrix at each section corresponding to a distinguishable color. Each body represents a quarter of the hour designated by the corresponding color of the section. Cylinder 40 encloses the timepiece movement and is closed by an opaque cover member 44; thus forming the casing of the timepiece. Reference indicator 45 (similar to those described in the preceding figures, except that the tip of means 45 terminates at a point below the area of the distinguishable color patterns), is enclosed by cylinder 40 and is mounted on shaft 46 which, in turn, is integrally secured to the axis of gear wheel 47. Gear wheel 47 is caused to make a complete rotation within the period of one hour by hour driving mechanism 48 of a standard timepiece. Accordingly, reference means 45 is caused to rotate around the inner wall of cylinder 40 and to successively indicate each of the color patterns and bodies of variable shape, thereby designating the hours and quarters of the hour in a 12 hour period.

FIG. 5 comprises a hollow, transparent color carrying cylinder 50 which forms the casing and which is divided into twelve numbered sections 51 representing the hours of a 12 hour period. Below each numbered section there appears a corresponding colored display area 52 which consists of two separate portions, namely an upper portion 53 and a lower portion 54, each portion comprised of different colors. Upper portion 53 is uniformly divided into 6 color sections 55 of distinguishable colors, i.e., distinguishable color temperatures of the same or different hues. The boundary of each color area 55 in portion 53 represents a 10 minute interval within the hour. Lower portion 54 is uniformly divided into seven color sections 56 of distinguishable colors which differ from the colors employed in portion 53. The color sections 56 of area 54 are reciprocally positioned with respect to those in area 53, so that the boundaries of the combined color sections of 53 and 54 provide an indication of each 5 minute interval within the hour designated in the numbered section as the sections are aligned with reference means 57 (illustrated by broken lines).

As shown in the accompanying perspective view (FIG. 5A), the lower inside circumference of transparent cylinder 50 is equipped with uniformly spaced teeth 61 or gears. Rotatable rod 57, which is enclosed by cylinder 50, is fixedly mounted on geared rotatable wheel 58 which is a planetary wheel in an epicyclic train of gears. Planetary gear wheel 58 is actuated by gear wheel 59 which, in turn, is driven by hour driving means 60 of a standard timepiece mechanism. Planetary gear wheel 58 is thereby caused to ride along the toothed inner circumference of hollow cylinder 50. Rod 57, carried on planetary wheel 58, revolves continuously as it is rotated around the inner wall of the cylinder indicating each hour corresponding to the number in the numbered section and each interval of the hour corresponding to the color sections.

It will be readily understood that the timepieces of the Figures provide a simplified movement, requiring only the hour movement of a standard timepiece. However, it is apparent that the minute movement of a standard timepiece can be substituted in any of the above drawings when the 12 hour time period is indicated by a separate means having an independent movement and is displayed on the same plane or a different plane as the cylinder, as in my copending application, Ser. No. 167,778, filed July 30, 1971. When the hours are so separately indicated, a standard digital assembly or an ordinary lance and dial assembly, as in a standard timepiece, can be employed in an area separate from the surface of the color cylinder. For example, when 6 color sections are employed in band 21 of FIG. 2 to represent 10 minute intervals, then a standard digital assembly denoting the hour can be separately mounted in the same plane inside a hollow transparent cylinder or in head portion 24 which can be adapted for viewing the hour by a transparent cover or window at the top of the timepiece. Many other modifications and variations of this arrangement will become obvious from this description and disclosure. For example, it will be apparent that in the above embodiments, any standard timepiece driving mechanism which normally controls the movement of the hour hand can be used. Also, any convenient indicating device, such as a wire, an arrow, an illuminated lucite rod, or a bead of light carried at the free end of the indicator may be used.

Although the reference indicator must complete a rotation around the cylinder within the desired time period which comprises a plurality of hours, its path need not be in a straight line. The indicator can be caused to make its rotation in a circuitous manner, e.g., by having the indicator mounted on a lever arm or slidably mounted on the gear wheel which is actuated by standard hour driving means. As an illustration, in FIG. 5, the rod may be slidably mounted on planetary gear wheel 58, i.e. through the axis or through an ec-

centric aperture in wheel **58**, and may be designed to carry a pin adapted to engage a continuous groove around the inner surface of cylinder **50**. The groove may be designed to impart a wave-like or peak-like motion to the rotating rod which floats in the aperture. So many structures are possible which vary or alter the specific embodiments described herein and which will be immediately evident to those skilled in the art, that it is not feasible to illustrate these variations in the disclosure.

Having thus described my invention I claim:

**1.** A timepiece comprising:

a. a timepiece driving mechanism capable of causing a member to make a complete rotation within a time period comprising a plurality of hours;

b. a cylindrical color carrying member having distinguishable color areas coded around its circumference in uniform sections to designate a first time period comprising a period of hours or minute intervals of an hour and having a second, separate plurality of indicia uniformly spaced around its circumference to denote a second time period of hours or minute intervals of an hour so as to separately display a time period of a plurality of hours and a time period of minute intervals of an hour;

c. a separate reference indicator member associated with a circumferential surface of said cylindrical color carrying member; and

d. means connected to said driving mechanism for causing relative rotational movement between said cylindrical color carrying member and said reference indicator member such that each of the distinguishable color areas of the cylindrical color carrying member are successively positioned at said reference indicator member, whereby said reference indicator member indicates a predetermined time interval.

**2.** The timepiece as recited in claim **1** wherein the member rotated by the means connected to said driving means makes a complete rotation within the period of 12 hours.

**3.** The timepiece as recited in claim **1** wherein the member rotated by the means connected to said driving mechanism makes a complete rotation within the period of 24 hours.

**4.** The timepiece as recited in claim **1** wherein the reference indicator member is rotated around a circumferential surface of a stationary cylindrical color carrying member.

**5.** The timepiece as recited in claim **1** wherein the cylindrical color carrying member is rotated and the reference indicator member is stationary.

**6.** The timepiece as recited in claim **1** wherein the cylindrical color carrying member is opaque and the reference indicator member overlays the outside circumferential surface of the cylinder.

**7.** The timepiece as recited in claim **1** wherein the cylindrical color carrying member is transparent.

**8.** The timepiece as recited in claim **1** wherein the cylindrical color carrying member and the reference indicator member are enclosed by a transparent casing.

**9.** The timepiece as recited in claim **1** wherein the reference indicator member is enclosed by a transparent, hollow cylindrical color carrying member.

**10.** The timepiece as recited in claim **1** wherein said second time period is represented by numerals and the first time period is represented by distinguishable colors.

**11.** The timepiece as recited in claim **1** wherein said first time period is represented by bands of distinguishable colors and the second time period, representing minute intervals of an hour, is represented by markings which divide each of the bands into a plurality of sections.

**12.** The time piece as recited in claim **1** wherein said first time period is represented by distinguishable colors in an area around the circumference and the second time period is represented on a separate circumferential area of the cylindrical color carrying member.

**13.** The timepiece as recited in claim **1** wherein a 12 hour period is represented by the distinguishable colors in an area around the circumference of the cylindrical color carrying member and minute intervals of one hour are represented in at least a portion of the same circumferential area of the cylindrical color carrying member.

**14.** The timepiece as recited in claim **13** wherein the minute intervals are represented by gem stones uniformly spaced across the sections containing the distinguishable colors.

**15.** The timepiece as recited in claim **13** wherein the minute intervals are represented by distinctive markings or patterns which are uniformly spaced across the sections containing the distinguishable colors.

**16.** The timepiece as recited in claim **1** wherein the upper portion of the cylindrical color carrying member is recessed, the sections of distinguishable colors and the second plurality of sections are displayed in said recessed portion and said reference indicator extends over the recessed portion of the cylindrical member.

**17.** The timepiece as recited in claim **1** wherein said first time period is represented by a plurality of separated areas on the circumference of the cylindrical member, each separated area of the time period contains a distinctive code of distinguishable colors and the second time period is represented by a plurality of sections displayed in a separate area on the circumference of the cylindrical member.

**18.** The timepiece as recited in claim **17** wherein at least one code of distinguishable colors is comprised of different color temperatures of the same hue.

**19.** The timepiece as recited in claim **1** wherein the lower outer circumferential surface of said cylindrical color carrying member is geared to engage a gear wheel which is connected to the timepiece driving mechanism and wherein said reference indicator member is mounted on said gear wheel at the axis thereof, so that the cylindrical color carrying member is rotated while the reference indicator member is stationary.

**20.** The timepiece as recited in claim **1** wherein the reference indicator member is enclosed by the cylindrical color carrying member, the cylindrical color carrying member is transparent and is equipped at the lower portion of its inner circumferential surface with gear teeth, said reference indicator member is mounted on a geared planetary wheel which is driven by a gear wheel connected to said driving mechanism in an epicyclic

train, thereby causing the planetary wheel and reference indicator member to be rotated around the inner circumference of the cylindrical color carrying member.

21. The timepiece as recited in claim 20 wherein the reference indicator member is a rod which is integrally mounted on said planetary wheel so that the rod revolves continuously as it is rotated around the circumferential inner surface of the cylindrical color carrying member.



22. The timepiece as recited in claim 19 wherein the inner circumferential surface of said cylindrical color carrying member contains a continuous channel, said reference indicator member floats in an aperture in the planetary wheel, the free end of said reference indicator member carries a pin which engages said channel on the inner circumferential surface of the cylindrical color carrying member and follows the path of said channel.

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