# United States Patent

**Komiyama**

[15] **3,683,614**

[45] **Aug. 15, 1972**


[54] **DAY CALENDAR TIMEPIECE WITH MULTIPLE LANGUAGE DISPLAYS**


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[22] Filed: **July 21, 1970**

[21] Appl. No.: **56,828**

[30] **Foreign Application Priority Data**

July 23, 1969 Japan .....44/69824

[52] **U.S. Cl.**.....**58/58,** 58/5

[51] **Int. Cl.**.....**G04b 19/24**

[58] **Field of Search**.....58/5, 58, 63, 73



[56] **References Cited**

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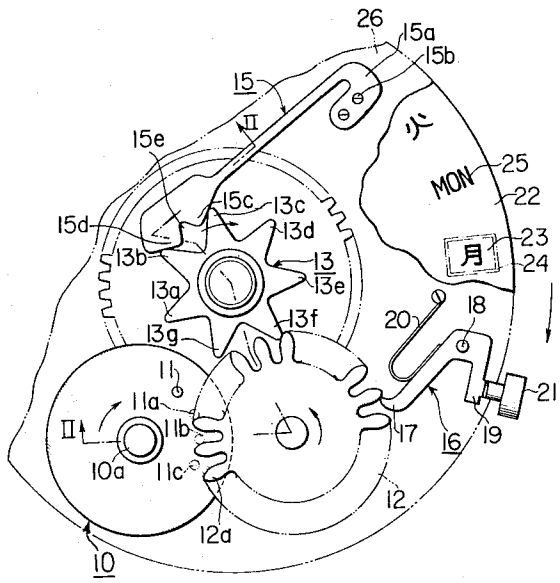
[57] **ABSTRACT**

The day dial of a calendar timepiece is provided with a plurality of language designations for each day. The jumper lever operating in in conjunction with the day star wheel is provided with two teeth have a circular pitch one half the circular pitch of the teeth on the day star wheel. A manual selection device is provided to shift the relative position of the jumper lever teeth relative to the teeth on the day star wheel thereby shifting the day dial to display a selected language.


**4 Claims, 3 Drawing Figures**



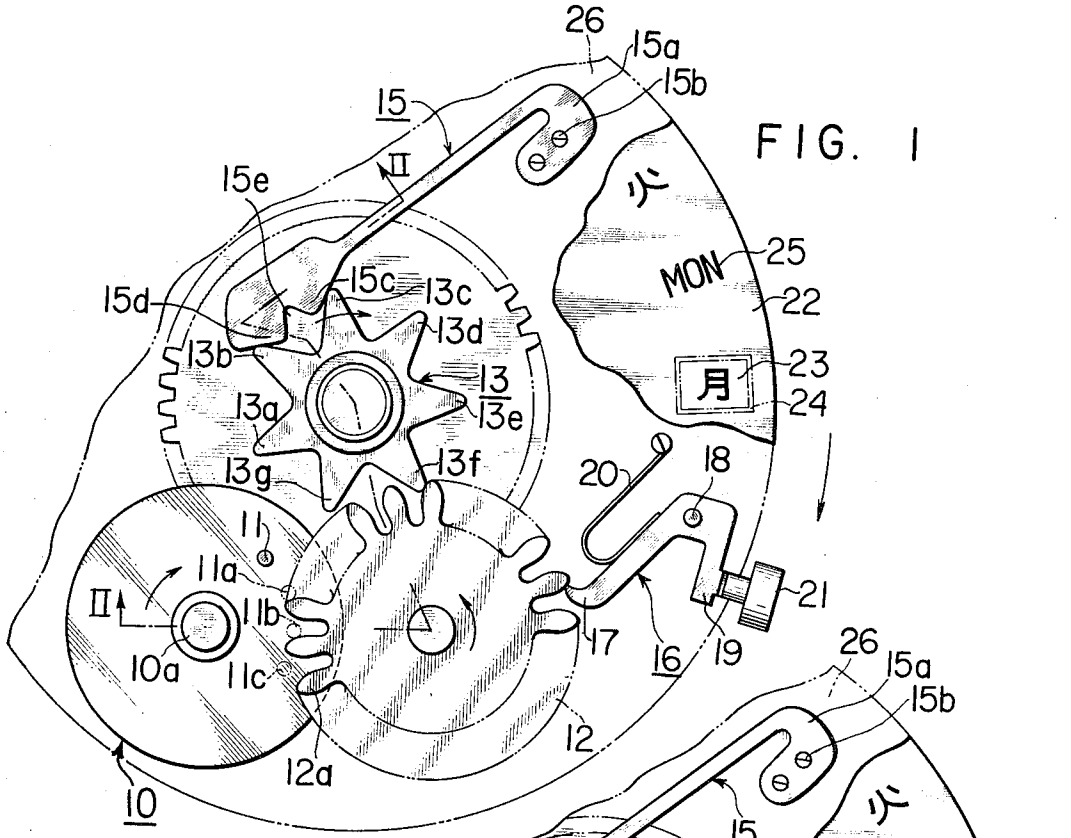



FIG. 1

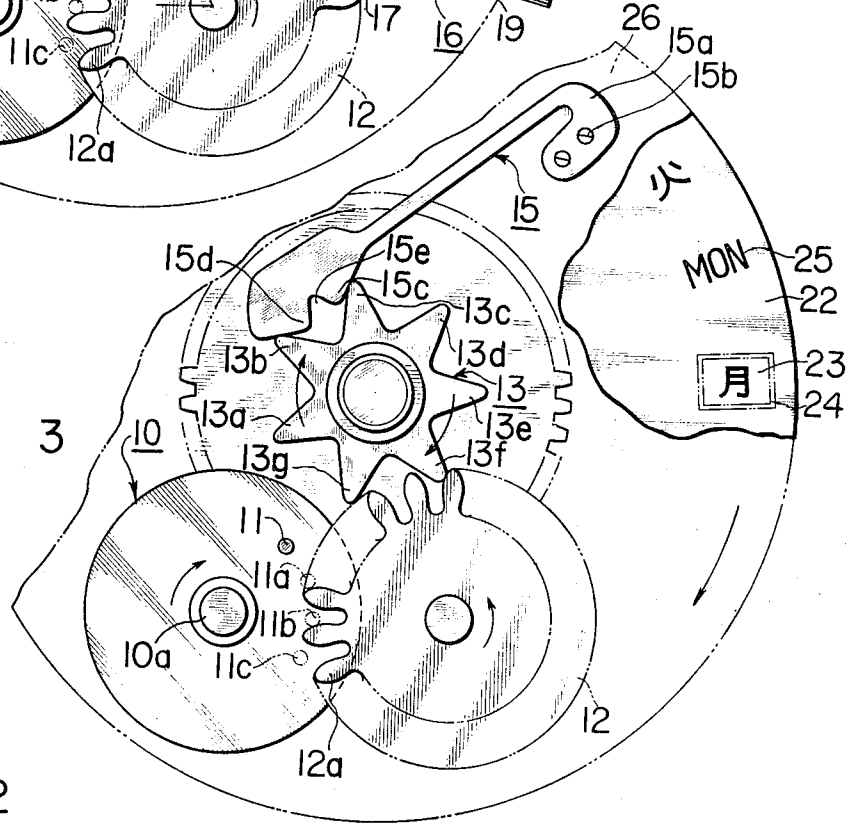
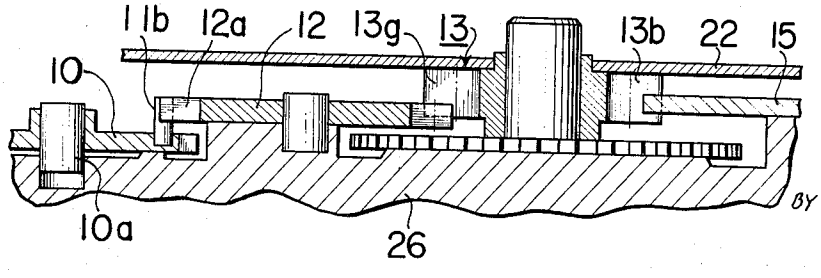



FIG. 3

FIG. 2

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# DAY CALENDAR TIMEPIECE WITH MULTIPLE LANGUAGE DISPLAYS

This invention relates generally with a day calendar timepiece. More specifically, it relates to improvements in and relating to the day calendar display mechanism of that kind of timepiece.

Conventional day calendar display mechanism represents a series of days expressed only with a sole language, for instance, English, French, German, Spanish, Japanese or the like.

Therefore, when timepieces are sold in several countries, the day calendar displays must be expressed in the respectively different languages. It means naturally a considerable drawback for timepiece manufacturers, as well as the consumers.

It is therefore a main object to provide a day calendar display mechanism for use with the calendar timepieces, capable of obviating substantially the aforementioned drawback.

More specifically, the object of the invention resides in the provision of an improved day calendar display mechanism bearing several series of calendar displays expressed in several languages and any one of these different language displays can be brought into its practical usage at the will of the timepiece wearer.

It is a further object of the invention to provide an improved day calendar display mechanism of the kind and nature above referred to which represents a simple design, yet being highly reliable and durable in its structure and function.

These and further objects, features and advantages of the invention will become more apparent in the following detailed description of several preferred embodiments of the invention by reference to the accompanying drawings.

FIG. 1 is a plan view of a first embodiment of the invention.

FIG. 2 is a section of the mechanism shown in FIG. 1, the section being taken substantially along a section line I—I′ shown therein.

FIG. 3 is a similar view to FIG. 1, illustrating a second embodiment of the invention.

Referring now to the accompanying drawings, more specifically FIGS. 1 and 2 thereof, numeral **10** represents a conventional day feed gear which is rotatably mounted on a conventional plate **26** of a timepiece movement, not specifically shown, and arranged as conventionally to perform a complete revolution for **24** hours by being reducingly driven from a conventional hour- or cannon wheel, not shown. A single pin **11** is fixedly mounted on the gear wheel **10**. Numerals **11***a* – **11***c* represent successive positions of this pin **11**. Numeral **12** represents a conventional day dial driving wheel which is rotatably mounted on the plate **26** and engages with a day star wheel **13** having seven star projections or teeth **13***a*–**13***g* which is rotatably mounted on a conventional hour or cannon wheel.

Numeral **22** represents only a part of a conventional day dial bearing thereon a alternately combined series of day calendar displays expressed in Japanese and English and fixedly attached to the day star wheel **13**, although the attaching means has been omitted for its very popularity and for simplification of the drawing.

The pin is so designed and arranged that it may engage with the teeth, being represented only by a single



and common numeral **12***a*, the wheel **12** being fed two tooth pitches for a complete revolution of the wheel **11**.

A jumper lever **15** is fixedly mounted at its root end **15***a* by means of two fixing screws **15***b* on the plate **26** and designed and arranged to cooperate with the star wheel **13**, as conventionally. This jumper lever **15** is, however, formed at its free end with a pair of substantially triangular engageable projections **15***c* and **15***d*, a lateral recess or groove **15***e* being formed therebetween. The circular pitch of these projections **15***c* and **15***d* is one half the pitch of the star wheel teeth **13***a*–**13**. Each step of the successive engagements of the jumper lever with the star wheel is thus performed by a half of the tooth pitch of the star wheel.

Day correction lever **16** is pivotably mounted at **18** on the plate **26**, the tip end **17** of the lever engaging with the teeth of wheel **12** and the opposite or root end **19** being kept in pressure contact with an operating button **21** which is arranged slidable in the radial direction of the plate **26**. For assuring said pressure engagement, there is provided a leaf spring **20** as shown, acting as a return spring for the lever **16**. By the provision of this return spring, the lever **16** is urged resiliently to turn in counter clock-wise direction in FIG. **1**.

Numeral **24** represents imaginally the position of a conventional display window formed in the conventional dial plate, not shown, of the timepiece movement for allowing to see the occasionally displayed day display therethrough by the timepiece wearer. In the position shown in FIG. **1**, the display corresponds to "Getsu" which is an abbreviation of "Getsuyo" corresponding to "Monday" in English.

The operation of the first embodiment of the invention so far shown and described is as follows:

In the case of the regular time-indicating operation of the timepiece movement, the pin **11** on the day feed gear **10** will shift from **11***a* through **11***b* to **11***c*, thus the day dial drive gear **12** being advanced two teeth, as was referred to hereinabove. By this operation, the day star wheel **13** will be advanced just one pitch. For this purpose, the wheel **12** is formed with **14** teeth. When it is assumed that a day calendar dial **25** carries thereon a combined and alternate series of Japanese and English day calendar representations as partly shown in FIG. **1** and one of the Japanese day calendar such as "Getsu" is seen through the viewing window, then the next or advanced calendar viewable therethrough will be "Ka" which corresponds to "Tuesday" when translated in English.

When it is desired to convert the day calendar display from Japanese to English, it is sufficient to push in the button **21**. In this way, the tip end **17** of day correction lever **16** will advance the drive wheel **12** just one tooth so that the star wheel **13** is shifted to a new position half pitch shifted from the foregoing one. This newly set portion of the star wheel is provisionally fixed by the specifically designed jumper lever **15**. Therefore, the day calendar displays viewable through the window **24** will be changed from the Japanese to the English. After such calendar converting operation, the pushed-in button **21** will return to the original position by virtue of the provision of return spring **20**. The time-indicating operation will be carried out in the same manner as before.

Next, referring to FIG. 3, the second embodiment of the invention will be described. In FIG. 3, all the same or similar constituents have been represented by the respective same reference numerals as before, irrespective of minor configurational and functional differences.

In the present embodiment, the operating button **21** has been dispensed with. The desired calendar display conversion is carried into effect by such operation that the day feed wheel **10** is turned in a reciprocating manner so as to shift the pin **11** from **11***a* to **11***c* and then back to **11***a*. The relative arrangement of said pin **11** to the drive wheel **12** is as before so that the latter is fed two teeth for a complete revolution of the gear **10**.

When it is desired to convert, for instance, Japanese day calendar to English one, the timepiece wearer manipulates the conventional winding stem, not shown, to advance the gear **10** so as to advance in clockwise direction in FIG. 3 the pin **11** from the position **11***a* to a new one **11***b*, thus the star wheel **13** being rotated just a half tooth pitch thereof. In this way, the Japanese calendar is replaced by the English calendar.

Then, the timepiece wearer manipulates the winding stem in the reverse direction, so as to rotate the gear **10** in counter clockwise direction in FIG. 3 from the position **11***b* to that shown at **11***a*. In this way, the star wheel **13** may be rotated in counter clockwise direction in a corresponding way, when the tooth backlash on the wheel **12** has been selected more loosely than the conventional value and the slopes on the projections **15***a* and **15***b* on jumper lever **15** have been selected more gentle than before, the desired operation can be attained without inviting a disorder engagement of the jumper projections. In this way, the pin **11** is returned to the position **11***a*. Thence, the day calendar displays will be viewable through the window **24** and in English in place of Japanese version, as the timepiece operates as usual.

It is naturally possible to introduce three or more different languages in the day calendar representations instead of two as was referred to above. In this case, the number of teeth on the day calendar dial must be increased correspondingly. In addition, the number of the jumper projections must be increased to the number of the different kinds of calendar languages. The relative pitch of these jumper projections must be decreased so as to provisionally positioning the star wheel at *n* - different for each specific day calendar position of the star wheel, if *n* be the number of the different calendar languages.

In practice, however, it is suffice to adopt the *n* being equal to 3.

From the foregoing, it will be clear that according to the novel teachings suggested by the present invention, several different kinds of languages can be employed in the day calendar representation and the timepiece wearer can select any one of them at his will and in an easy and highly convenient way.

The number of teeth on the star wheel must not be modified in any case of the foregoing several embodiments and modifications. Therefore, the timepiece manufacturer can manufacture a large number of a unified style of the star wheel-and-calendar dial-combination. Only necessary procedure to be taken at the side of the manufacturer is to print differently selected calendar representations with conveniently adopted several languages familiar to the timepiece consumers.

It can be therefore said that the present invention provides a considerable progress in the art.

The embodiments of the invention in which as exclusive property or privilege is claimed are as follows:

**1.** In a display mechanism of a day calendar timepiece comprising a day feed gear, a day dial driving wheel, and a day star wheel mechanically connected one after another, a jumper lever resiliently cooperating with said star wheel and a day calendar dial fixedly mounted on said star wheel, said star wheel being formed on its periphery with seven teeth, the improvements comprising *n* - different day calendar representations, *n* being preferably the number of different languages employed, and *n* - successive jumper projections formed on said jumper lever for cooperation with said star wheel for positioning said star wheel at *n* - different positions for each of 7 day calendar displays.

**2.** The mechanism as set forth in claim **1**, further comprising a control push button slidably mounted on the conventional plate of a timepiece movement, a lever pivotably mounted on said plate and arranged to cooperate with said button and said driving wheel, and a return spring acting upon said lever, for converting the calendar display from one already selected one to another newly selected one by advancing said star wheel relative to said jumper a fraction of the star wheel tooth pitch equal to 1/n.

**3.** The mechanism as claimed in claim **1**, characterized by that said day dial driving wheel is formed with seven times *n* teeth on its periphery.

**4.** The mechanism as claimed in claim **3**, characterized by that said dial feed gear is provided with a pin adapted for engagement with said driving wheel.

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# UNITED STATES PATENT OFFICE
# CERTIFICATE OF CORRECTION

Patent No. 3,683,614 Dated August 15, 1972

Inventor(s) Katsuhiko Komiyama

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In The Heading:

The name of the Assignee was omitted. Should read:

--Assignee: Citizen Watch Co., Ltd. , Tokyo, Japan--

Signed and sealed this 13th day of March 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334

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