Dec. 5, 1950 P. L. MORSE 2,532,819

RHYTHM CYCLE CALCULATOR

Filed April 16, 1946 2 Sheets-Sheet 1

FIG. 1

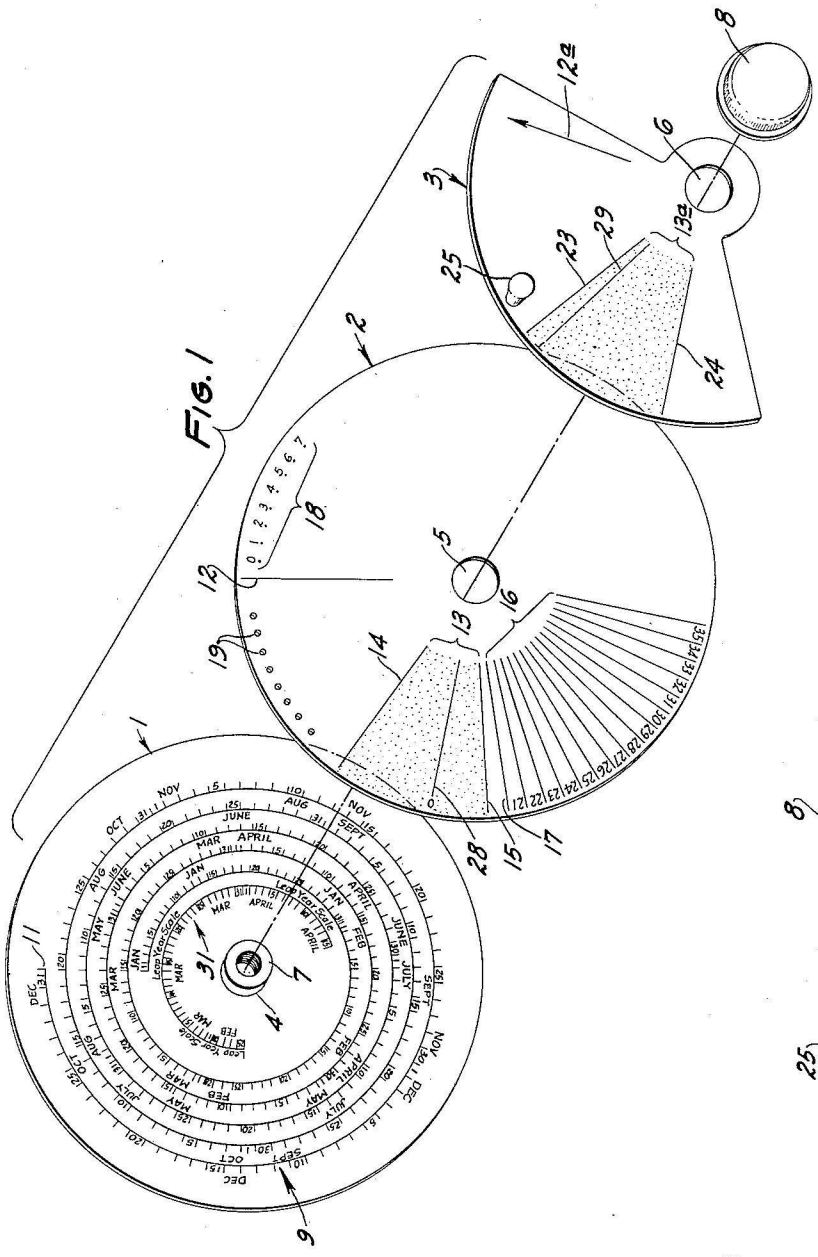
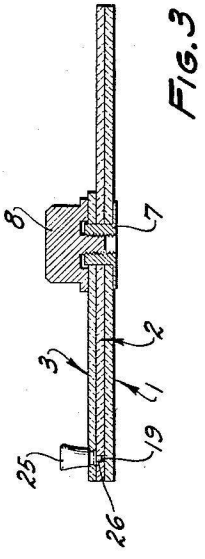


FIG. 3



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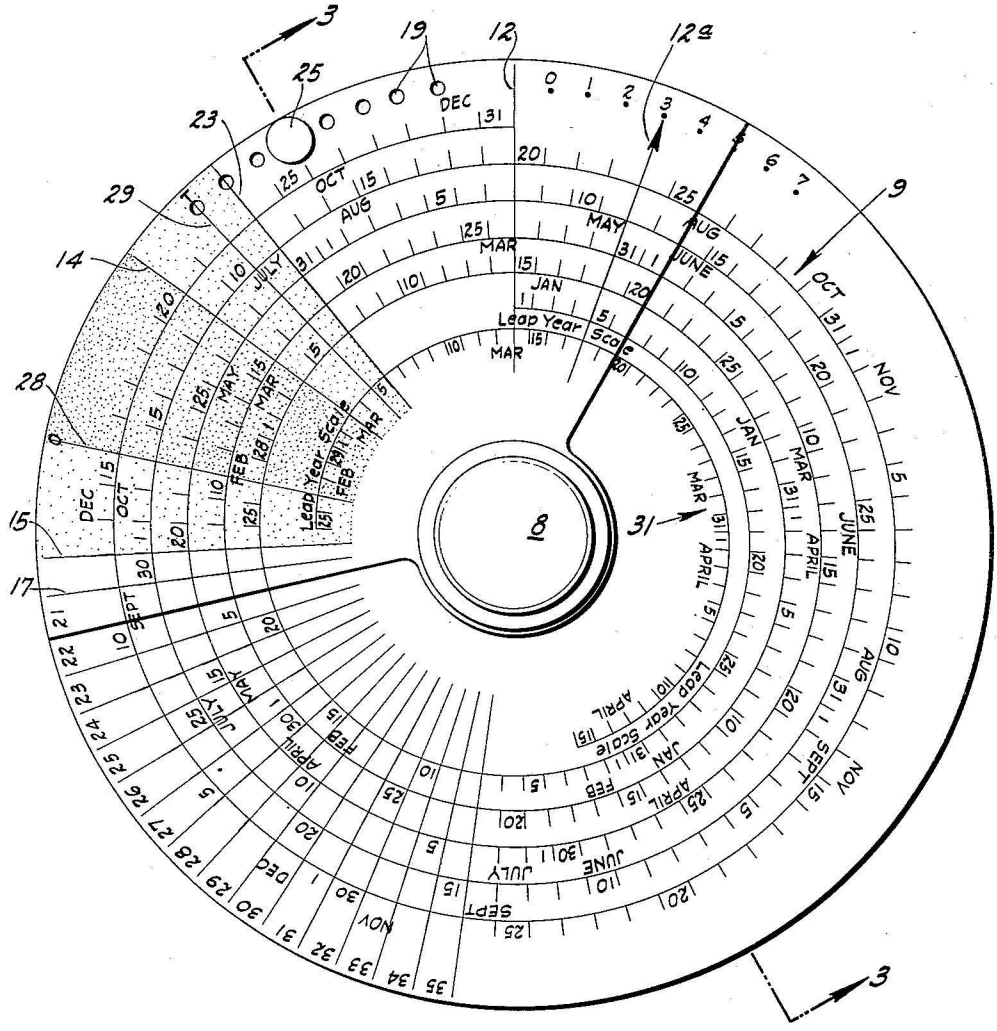

FIG. 2

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RHYTHM CYCLE CALCULATOR

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8 Claims. (Cl. 235—67)

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This invention relates to a calculator, and more particularly to a calculator for determining the fertile and infertile periods of women occurring during their menstrual cycles.

The rhythm system of birth control has been well established by the medical profession (see for example "Birth Control" by Thurston S. Welton, 1943, published by Walter J. Black, Inc.) and depends upon the following three scientific facts:

1. Ovulation of a female occurs only within a period of twelve to sixteen days preceding the start of her next menstrual period, this period of ovulation being independent of the length of time of menstrual flow and the length of the menstrual cycle.

2. The ovum can be fertilized only within twenty-four hours following ovulation.

3. The ovum can be fertilized only by spermatozoa not older than seventy-two hours.

It therefore follows that fertilization of the ovum can take place only as a result of coitus taking place some time within an interval of eight days lying between the eleventh and nineteenth days preceding the start of the next subsequent menstruation. For ready reference this interval will be referred to hereinafter as the "conception period."

Since there is a variation from month to month in the menstrual cycle of many normal women, it is impossible to predict the first day of the next succeeding menstruation. It therefore becomes necessary to include with the conception period of any particular female, the maximum number of days which her menstrual period is known to vary. For example, if a female has a menstrual cycle varying from twenty-eight to thirty days, per possible maximum conception period would be ten days rather than the eight days of a female who has a regular menstrual cycle. The first possible day of her conception period would then occur nineteen days preceding her next menstruation calculated on the basis of her shortest menstrual cycle, and the last possible day of her conception period would end on the eleventh day preceding her next menstruation calculated on the basis of her longest menstrual cycle.

In general the object of this invention is the provision of a calculator based on the above biological phenomenon for determining the conception period of any woman, the interval of time within this period during which coitus is most likely to result in conception, and the possible start of the next menses and the duration of the next menstrual cycle.

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More specifically, the object of this invention is the provision of a calculator of the character described including a calendar disk, a transparent disk superposed on the calendar disk and provided with a menstrual cycle scale and a conception period sector, and a transparent cycle variation sector superposed on the menstrual cycle disk, these members being arranged for rotation relative to each other and means being provided for securing the menstrual cycle variation sector in various predetermined positions relative to the transparent disk.

The invention possesses other advantageous features, some of which with the foregoing will be set forth at length in the following description where that form of the invention which has been selected for illustration in the drawings accompanying and forming a part of the present specification is outlined in full. In said drawings, one form of the invention is shown, but it is to be understood that it is not limited to such form, since the invention as set forth in the claims may be embodied in a plurality of forms.

Referring to the drawings:

Fig. 1 is an exploded view of a calculator embodying the objects of my invention.

Fig. 2 is a top plan view of the calculator shown in Fig. 1.

Fig. 3 is a section taken on the line 3—3 of Fig. 2.

The calculator shown in these various figures includes a calendar or date disk 1 which may be either opaque or transparent, a transparent menstrual cycle and conception disk 2, and a transparent menstrual cycle variation and conception sector 3. Obviously the sector 3 can be replaced with a full disk, and a sector can replace the disk 2.

The members 1, 2 and 3 are provided respectively with central holes 4, 5 and 6 for the reception of a nut 7 about which the three disks are arranged to rotate. Threaded to the nut 7 is a knurled-headed screw 8 for clamping the three disks together in various predetermined angular positions relative to each other.

The calendar or date disk 1 is provided with a spiral calendar 9 covering the 365 days of the year and originating and terminating on a common reference line 11 so as to be continuous. As shown in Figs. 1 and 2, the respective days of the year are subtended by angles of equal degrees, the progression of the calendar being in a clockwise direction.

Indicated on the disk 2 is a radial reference line 12 and a first conception sector 13 bounded by a radial line 14 located eleven days in a counterclockwise direction away from the reference line 12 and by a radial line 15 located in a counterclockwise direction eight days away from the radial line 14. Preferably the sector 13 is lightly stained with any suitable color such as a transparent green so as to make it readily distinguishable from the remaining portion of the disk. Also formed on the disk 2 is a menstrual cycle sector 16 formed by sixteen radial lines, each line being spaced from the next succeeding line through an angle equal to the angle subtending each day on the calendar disk 1. Since the marginal radial line 17 of the sector 16 is located twenty full days away from the reference line 12 (measured in a counterclockwise direction) it will be seen that the successive fifteen spaces defined by the sixteen equally spaced radial lines successively represent the twenty-first through thirty-fifth days measured from the reference line 12. It will therefore be apparent that the menstrual cycle sector 16 covers all of the probable menstrual cycles to which a woman may be subject.

Also provided on the disk 2 is a menstrual cycle variation scale 18 including a plurality of equally spaced dots numbered consecutively from 0 to 7 inclusive, the spacing between each dot being equivalent to the angle subtending each day on the calendar 9, and the zero dot being located one day clockwise from the reference line 12. Punched in the disk 2 are eight holes 19 having the same spacing as the dots of the scale 18 and the function of which will be presently described.

The sector 3 is provided with a reference line 12*a* and with a conception sector 13*a* bounded by radial lines 23 and 24. The radial line 23 is spaced a distance equal to twelve days counterclockwise from the reference line 12*a*, and the radial line 24 is spaced a distance of eight days counterclockwise from the radial line 23. It will therefore be seen that when the reference line 12*a* of the sector 3 is placed directly over the zero dot of the scale 18 the conception sector 13*a* will lie over and be in exact registration with the conception sector 13 of the disk 2. This setting of the sector 3 and disk 2 is used only in cases where there is no variation in the menstrual cycle. In cases where such a variation does occur, the reference line 12*a* is positioned so as to lie over that particular dot of the variation scale 18 indicated by the number representing the maximum number of days over which the menstrual cycle has been found to vary. If, for example, a woman knows that her cycle can vary by as much as three days, the reference line 12*a* is positioned over dot Number 3. However, care must be exercised in determining the extent to which any woman's cycle may vary. Secured to the sector 3 is a knob 25 provided with an inwardly or downwardly protruding pin 26 arranged to be received in any one of the holes 19. The pin 26 therefore serves to lock the sector 3 in various selected angular positions relative to the disk 2 with the reference line 12*a* in registration with any one of the dots 0 to 7 inclusive of the scale 18. Since the sector 3 as well as the disks 1 and 2 are preferably made of plastic, the adjustment of the pin 26 into any one of the holes 19 can be accomplished by merely springing the sector 3 upwardly, rotating it, and then permitting the pin to drop into the desired hole. The pin 26 should be so located that when the sector 3 is superposed over the disk 2 about their common axis with the reference line 12*a* one day clockwise from the reference line 12, the pin 26 will be seated within the first of the holes 19.

The ovulation period is the period of greatest fertility, and this period must lie between the twelfth day preceding the start of the next menstruation calculated on the basis of the female's longest cycle and the sixteenth day preceding the start of her next menstruation calculated on the basis of her shortest cycle. To enable this highly fertile period to be readily determined, the disk 2 is provided with a radial line 28 sixteen days from the reference line 12, and the sector 3 is provided with a radial line 29 thirteen days away from the reference line 12*a*. The four-day ovulation period will then lie somewhere within the sector defined by the radial lines 28 and 29.

The dates on the calendar disk lying between lines 12 and 12*a* represent the interval during which the next succeeding menstruation will start if pregnancy has not resulted.

To make my calculator applicable on leap year, the disk 1 is provided with a leap year calendar 31 covering the period between February 25 and April 15. February 25, 26, 27 and 28 of this calendar are in radial alignment with the corresponding days of the main calendar 9, the remaining days being offset by one day in view of the fact that on leap year February has twenty-nine rather than twenty-eight days.

To use the calculator above described, the female in question determines from past history the greatest variation in the length of her menstrual cycle. Assuming that this variation is three days, the reference line 12*a* of the sector 3 is aligned with the number 3 of the menstrual cycle variation scale 18. The pin 26 is then permitted to fall within the hole 19 with which it registers so as to lock the disk 2 and sector 3 in this predetermined selected position.

Assuming that the shortest menstrual cycle of the female in question is twenty-nine days and that her menstrual period has started on December 3, the disk 2 and sector 3 are rotated in unison until that radial space of the menstrual cycle sector 16 corresponding to the twenty-nine days falls over December 3 on the calendar 9. The total area covered by the fertility sectors 13 and 13*a* will then line on December 13 through December 23, as shown in Fig. 2, and indicates the so-called fertility period. If coitus occurs during this period it is possible for fertilization of the ovum to take place. Coitus occurring during this menstrual cycle at any time other than the conception period will be ineffective to cause fertilization. The calendar dates December 16 through December 22, lying between lines 28 and 29, represent the optimum time for conception. The calendar dates January 1 through January 4, lying between lines 12 and 12*a*, represent the interval of time during which the next subsequent menstruation will begin if pregnancy has not resulted.

During leap year when the current menstrual cycle includes February 29, all dates from and including February 29 to the end of the current cycle are read on calendar 31.

As above stated, the menstrual cycle variation scale 18 starts one day clockwise from the reference line 12. In effect this adds one day to the maximum menstrual cycle and compensates for any possible error which may be made in com-

puting the length of the menstrual cycle. Normally the length of the cycle is determined by simply counting the days between the starting days of two consecutive menstrual periods. However, this method of determining the cycle is not necessarily correct. Assume, for example, that the first menstruation occurs on June 21 at 2:00 a. m. and the next succeeding menstruation occurs on July 21 at 11:00 p. m. This would seem to indicate a thirty-day menstrual cycle. Actually the elapsed time between the two menstruations is thirty days and twenty-one hours, or approximately thirty-one days.

I claim:

1. A calculator of the character described comprising: a calendar in which the days and months of the year are indicated on a continuous date scale originating and terminating on a common line; first and second transparencies overlying said normal calendar coaxially therewith and arranged for relative rotation with respect to each other and to said calendar, each transparency being provided with a fertility reference line and with means for indicating the normal conception period of a woman, said period covering eight days and originating nineteen days measured from said fertility reference line in a direction reverse from said date scale; a menstrual cycle scale provided on said first transparency, said scale originating from the fertility reference line of said first transparency and extending in a direction reverse to said date scale and including the minimum and maximum menstrual cycles to which women are normally subject; and a menstrual cycle variation scale provided on one of said transparencies and including the maximum number of days over which the menstrual cycle of women normally varies.

2. A calculator of the character described comprising: a normal calendar in which the days and months of the year are indicated on a continuous date scale originating and terminating on a common line; first and second transparencies overlying said calendar coaxially therewith and arranged for relative rotation with respect to each other and to said calendar, each transparency being provided with a fertility reference line and with means for indicating the normal conception period of a woman, said period covering eight days and originating nineteen days measured from said fertility reference line in a direction reverse from said date scale; a menstrual cycle scale provided on said first transparency, said scale originating from the fertility reference line of said first transparency and extending in a direction reverse to said date scale and including the minimum and maximum menstrual cycles to which women are normally subject; a menstrual cycle variation scale provided on said first transparency, said latter scale originating on the fertility reference line of said latter transparency and extending in the same direction as said date scale and including the maximum number of days over which the menstrual cycle of women normally varies; and means for locking said transparencies in any predetermined adjusted position.

3. A calculator such as defined in claim 1 wherein said normal calendar is provided with a supplemental leap year calendar covering the period from February 29 through at least April 11, and wherein February 29 of the supplemental leap year calendar is in alignment with March 1 of the normal calendar.

4. A calculator of the character described comprising: a disk on which is indicated a continuous normal annual calendar originating and terminating on a common radial reference line; first and second transparencies overlying said disk and arranged for relative rotation with respect to each other and with respect to said disk about a common axis; a menstrual cycle reference line and identical fertility sectors indicated on each of said transparencies; and a menstrual cycle variation scale provided on one of said transparencies.

5. A device of the character described in claim 4 wherein said disk is provided with a supplemental leap year calendar covering the period from February 29 to April 11 and wherein February 29 of said leap year calendar is in alignment with March 1 of said normal calendar.

6. A calculator of the character described comprising: a disk on which is indicated a continuous annual calendar originating and terminating on a common radial reference line; first and second transparent sectors overlying said disk coaxially therewith and arranged for relative rotation with respect thereto; a menstrual cycle reference line and identical fertility sectors indicated on each of said first and second sectors; a menstrual cycle variation scale provided on one of said first and second sectors; and means for locking said first and second sectors in any predetermined angular relation with respect to each other.

7. A calculator of the character described comprising: a calendar disk in which the days and months of the year are indicated on a continuous date scale originating and terminating on a common radial line; first and second transparencies overlying said normal calendar disk and arranged for relative rotation with respect to each other and to said calendar disk about the axis thereof, each transparency being provided with a fertility reference line and with a sector subtending the normal conception period of a woman, said period covering eight days and originating nineteen days measured from said fertility reference line in a direction reverse from said date scale; an ovulation date line indicated on each of said sectors and so located thereon that when said sectors are superposed they will subtend the ovulation period of four days; a menstrual cycle scale provided on said first transparency, said scale originating from the fertility reference line of said first transparency and extending in a direction reverse to said date scale and including the minimum and maximum menstrual cycles to which women are normally subject; and a menstrual cycle variation scale provided on one of said transparencies and including the maximum number of days over which the menstrual cycle of women normally varies.

8. A calculator of the character described comprising: a normal calendar in which the days and months of the year are indicated on a continuous date scale originating and terminating on a common line; a transparency overlying said normal calendar and arranged for rotation with respect thereto; a fertility reference line and a conception period zone indicated on said transparency, said zone covering a period of eight days originating nineteen days measured from said fertility reference line in a direction reverse of that of said date scale; a menstrual cycle scale provided on said transparency, said scale originating from said fertility reference line and extending in a direction reverse to that of said date scale; and a supplemental leap year calendar as-

sociated with said normal calendar, the 29th of February of said leap year calendar being in alignment with March 1 of said continuous date scale, and said leap year calendar including the maximum number of days normally found in women's menstrual cycles.

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