(12) UK Patent Application (19) GB (11) 2 367 385 (13) A

(43) Date of A Publication 03.04.2002

(21) Application No 0023451.8

(22) Date of Filing 25.09.2000

(71) Applicant(s)
Protein Limited
(Incorporated in the United Kingdom)
53 Great Eastern Street, LONDON, EC2A 3HP,
United Kingdom

(72) Inventor(s)
William Rowe

(74) Agent and/or Address for Service
Withers & Rogers
Goldings House, 2 Hays Lane, LONDON, SE1 2HW,
United Kingdom

(51) INT CL[7]
G04B 19/00

(52) UK CL (Edition T)
G3T TA4B2

(56) Documents Cited

GB 2281420 A	GB 2275353 A
GB 2259160 A	GB 2202972 A
GB 2186400 A	GB 1567514 A
EP 0492027 A1	WO 99/57614 A1
CH 000613587 A	DE 029704001 U
DE 029621215 U	DE 019535885 A
DE 003142478 A	JP 610207980 A
US 5636185 A	US 5289301 A
US 5228013 A	US 3854279 A

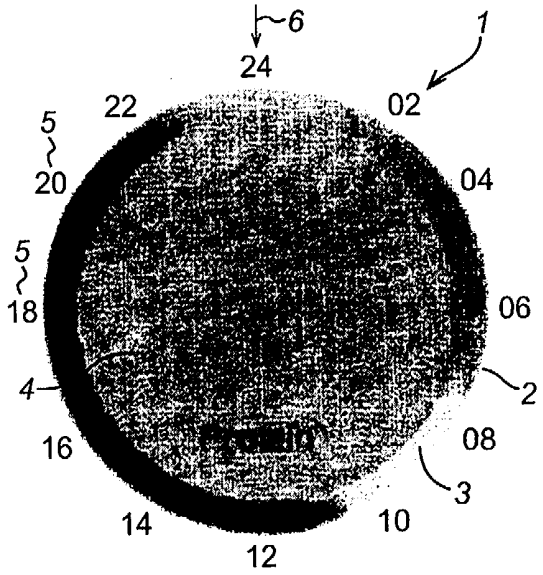
(58) Field of Search
UK CL (Edition S) **G3T TA4B1 TA4B2 TA4B3 TA4B4A TA4B4B TA4B5 TRA**
INT CL[7] **G04B 19/00 19/04 19/34 45/00**
ONLINE: WPI, EPODOC, JAPIO.

(54) Abstract Title
Clock

(57) A clock has a first region 3 of gradually changing visual characteristics e.g. colour or hue and a second region 4 in which the visual characteristics can be changed over time so that the time can be indicated where the visual characteristics match e.g. at point 6. Preferably, a time scale 5 is also provided. The clock can also indicate e.g. the lunar cycle or have a global positioning device so that the time can be adjusted automatically. The clock can be circular, as shown or linear (Figs 5-8). It can be mechanical with a bevel which rotates or be part of a display e.g. on a computer. In the later case, the clock, or each colour can be linked to a piece of software or a web page to open them when clicked on.

FIG.1

Daily 24 hour Protein Chromo
showing mid-night



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

GB 2 367 385 A

FIG. 1

Daily 24 hour Protein Chromo
showing mid-night

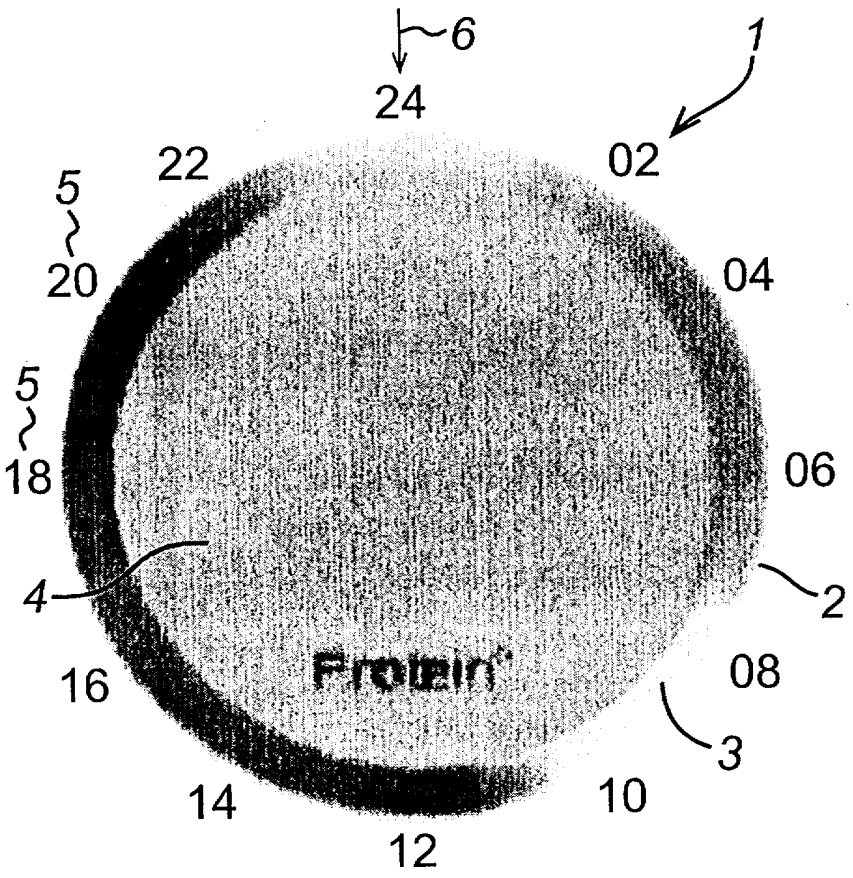
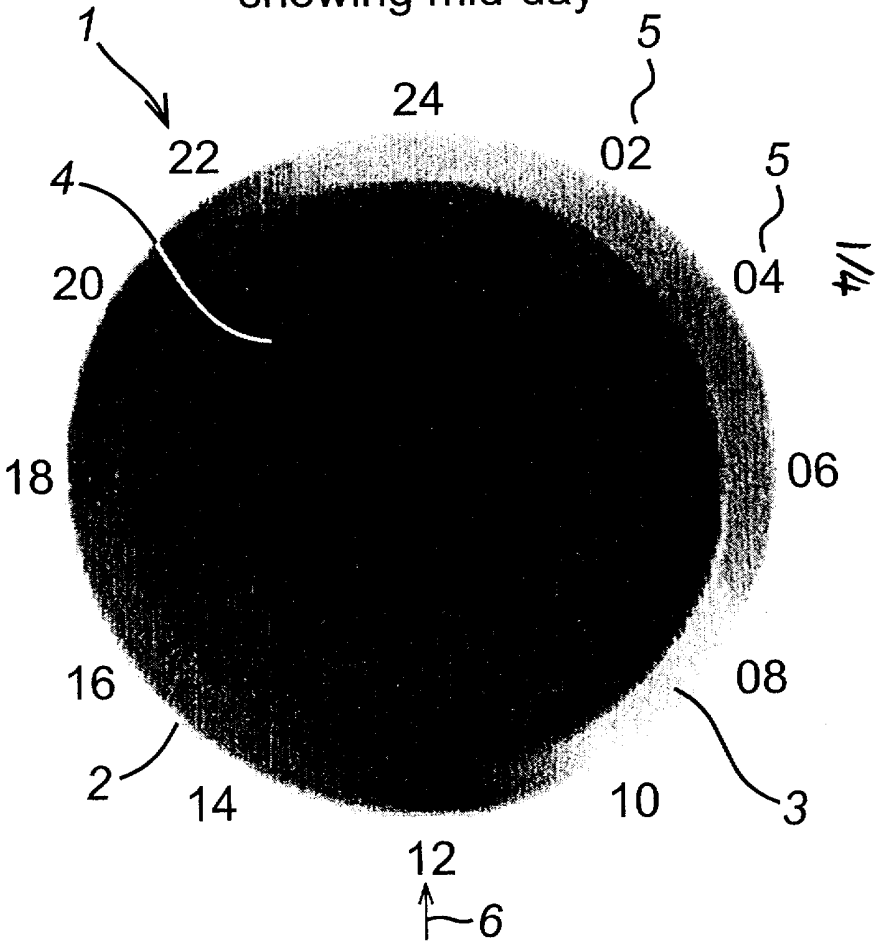


FIG. 2

Daily 24 hour Protein Chromo
showing mid-day



1/4

FIG. 3

Daily 24 hour Protein Chromo
showing 6 p.m.

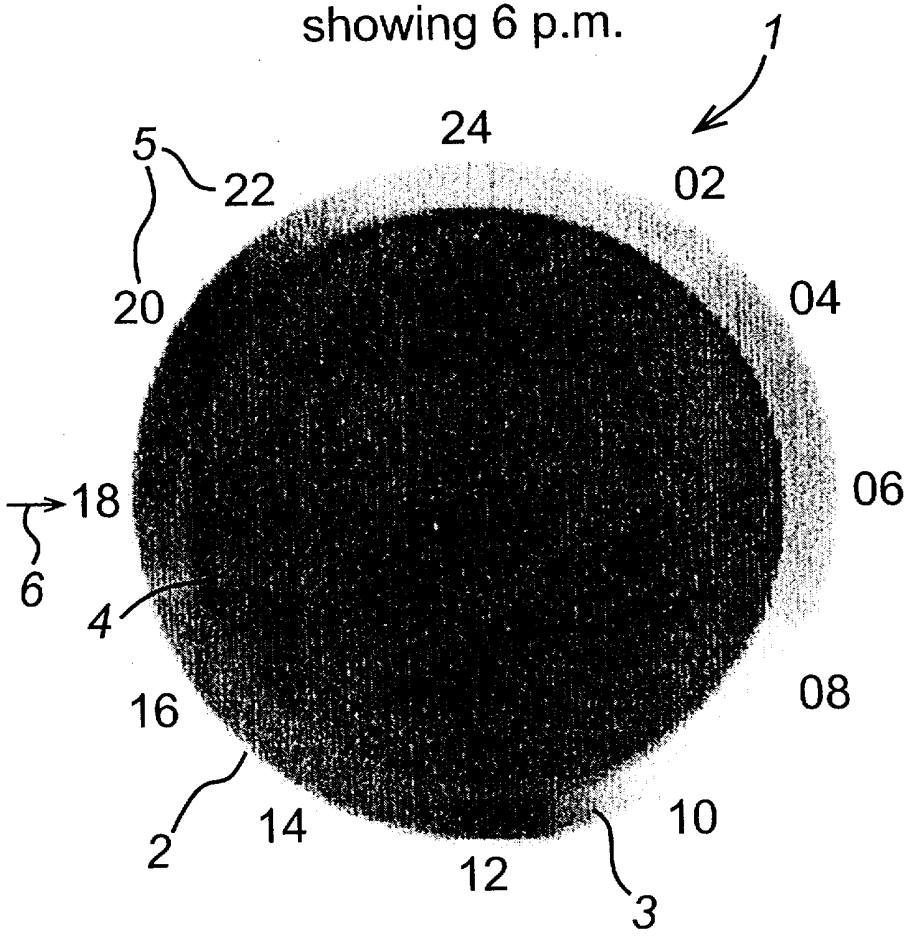


FIG. 4

Daily 24 hour Protein Chromo
showing 6 a.m.

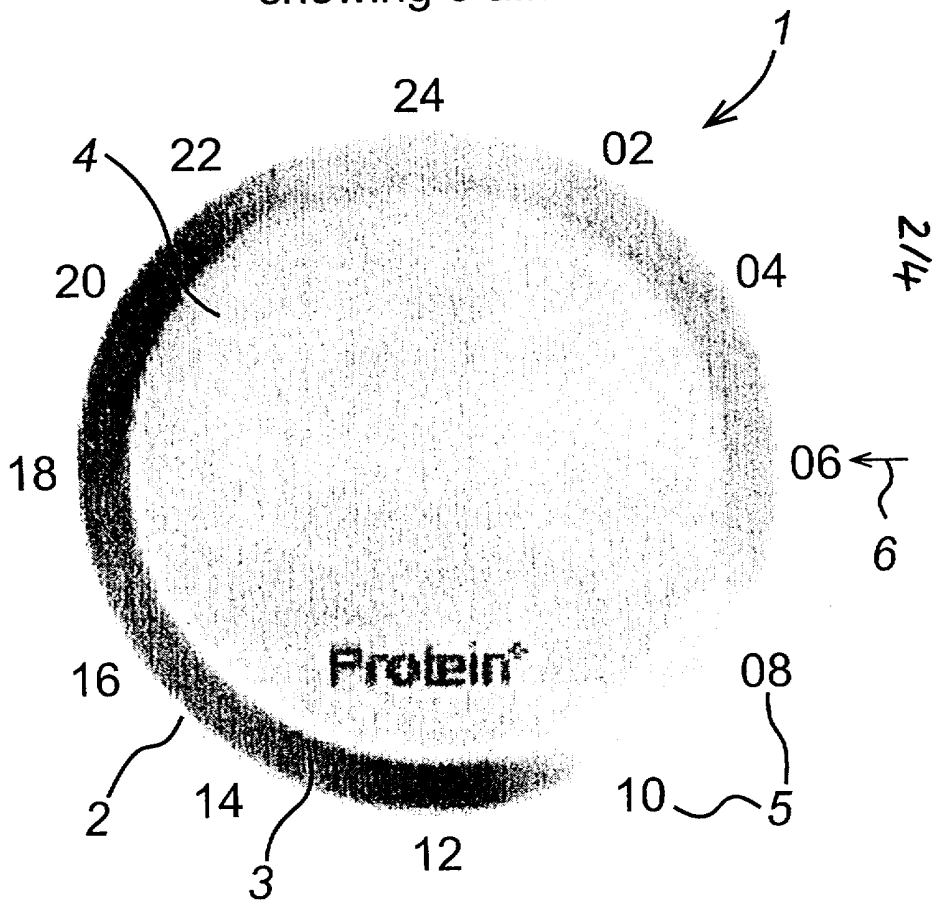


FIG. 5

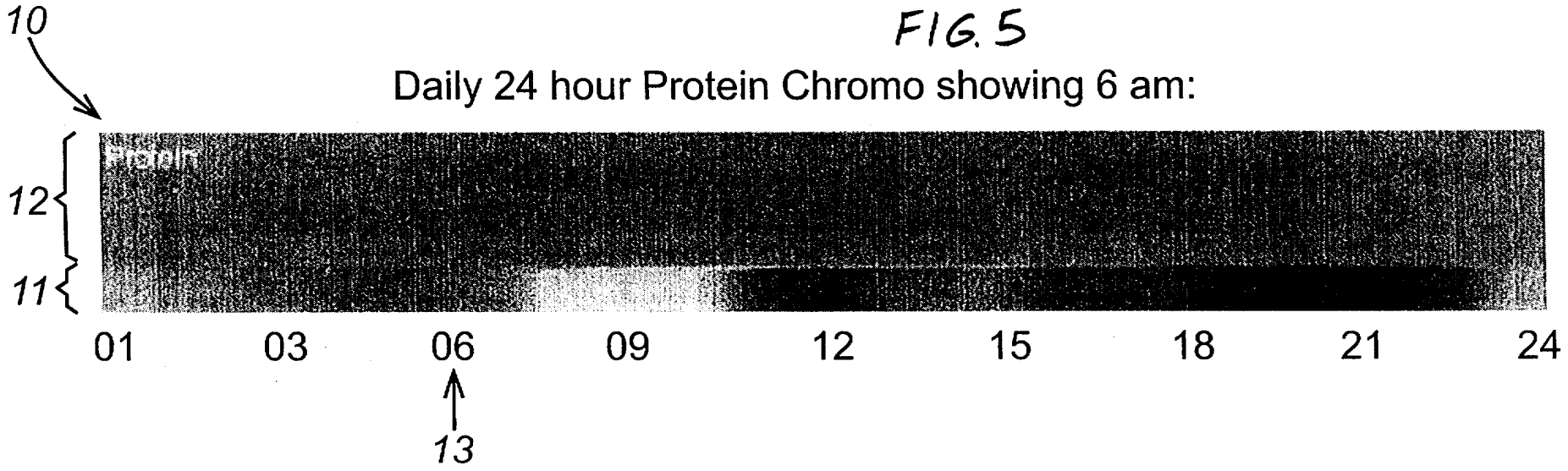

10
Daily 24 hour Protein Chromo showing 6 am:
Protein
12
11
01
03
06
09
12
15
18
21
24
13

FIG. 6

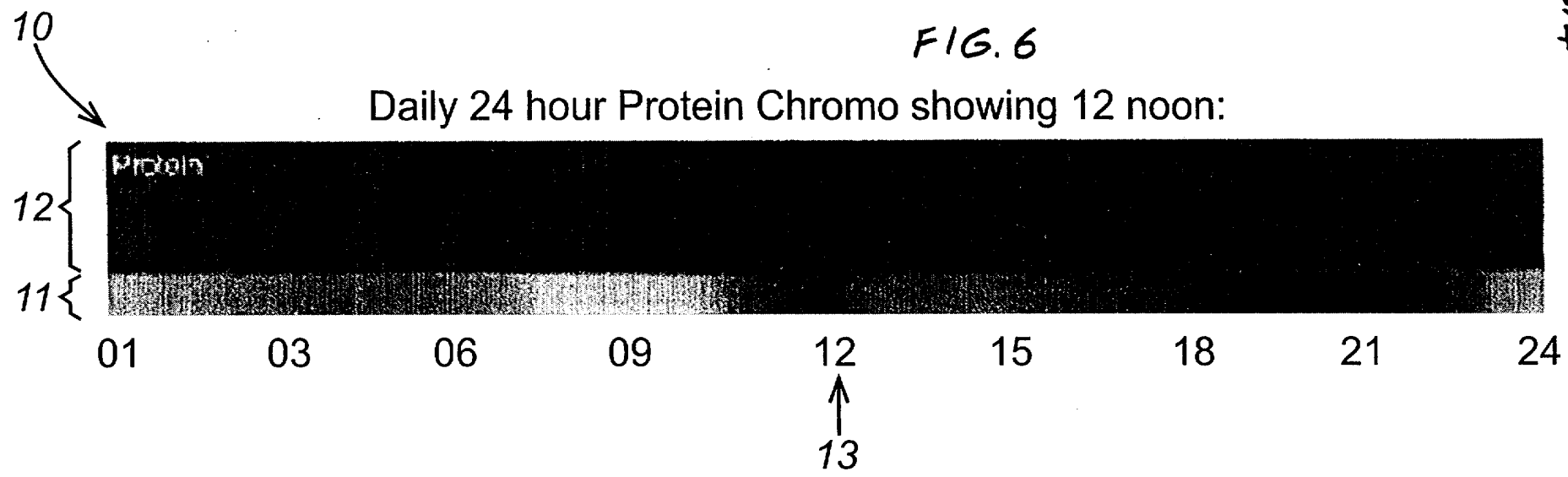

10
Daily 24 hour Protein Chromo showing 12 noon:
Protein
12
11
01
03
06
09
12
15
18
21
24
13

FIG. 7

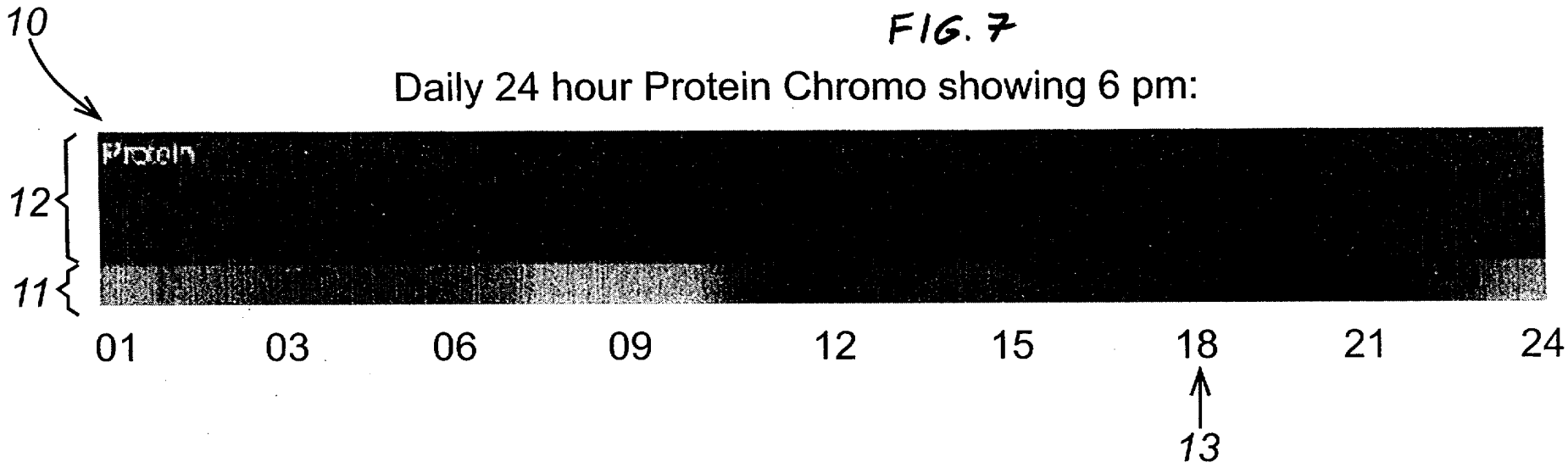
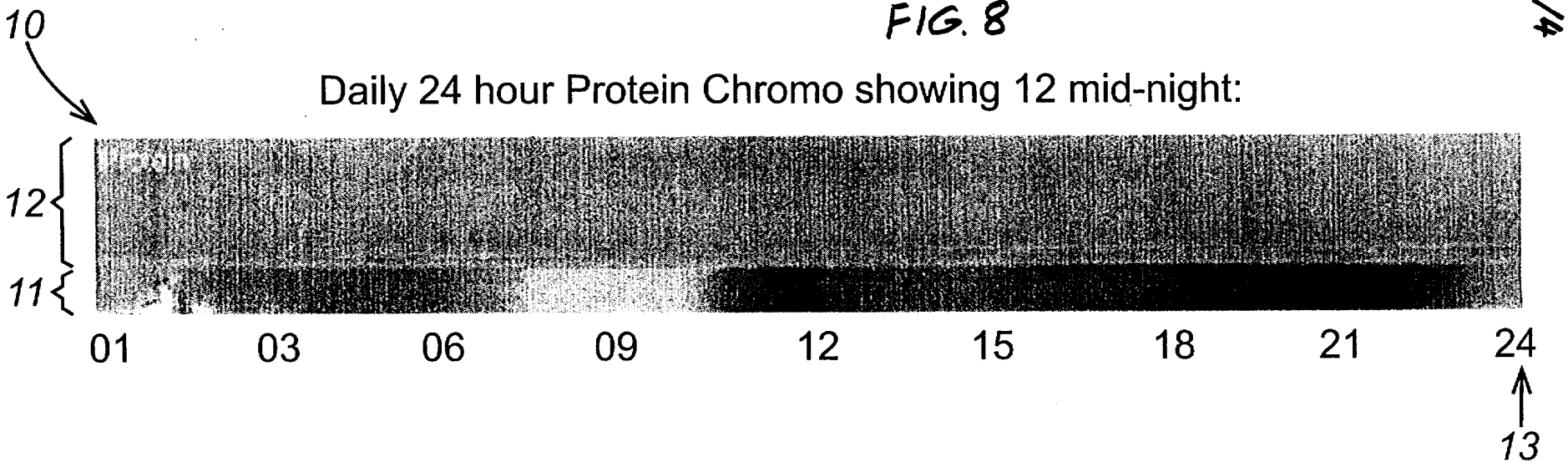

10
Daily 24 hour Protein Chromo showing 6 pm:
Protein
12
11
01
03
06
09
12
15
18
21
24
13

FIG. 8


10
Daily 24 hour Protein Chromo showing 12 mid-night:
12
11
01
03
06
09
12
15
18
21
24
13

Clock

The present invention relates to a clock which indicates the time. Such a clock may be implemented in several different ways, such as in the form of a watch, or on a screen, for example the screen of a computer or television.

Existing clocks may be in the form of a watch which can be worn on the wrist, a clock which would normally be placed somewhere prominent so that the time may be seen quite easily, or on a television or computer screen where the time is indicated normally at the bottom or in a corner of a screen. Clocks are normally either analogue or digital. Analogue clocks indicate the time with hands which move round a clock face, whereas digital clocks display the time in the form of numbers. In the case of most clocks and watches, the hands are mechanically moved, whereas in most digital clocks and watches, the numbers are shown on a seven segment liquid crystal or light emitting diode display. On a screen, a clock can be shown in analogue form with an image of hands pointing to indicate the correct time, or in digital form.

According to this invention, the time is indicated in a completely different way.

According to a first aspect of the invention, a clock comprises a first region across or along which there is a gradual change in visual characteristics; and a second region which has the visual characteristic of a point across or along the first region which is an alignment point; wherein the first and second regions are arranged to be gradually changeable to shift the visual characteristics relative to each other to move the position of the alignment point on the first region, whereby the time is indicated by the position of the alignment point. This allows the clock to indicate the time by the position of the alignment point. There might be a time scale indicated along either the second region or the first region against which the alignment point may be compared to read the time. Alternatively, if the time is arranged as a conventional analogue clock, in which twelve hours are indicated around the rim of the clock face, if the alignment point is at the top

of the clock face, it will indicate 12 o'clock, whereas if the alignment point is at the bottom of the clock face, it will indicate 6 o'clock, and so on.

In the first preferred arrangement, the second region is arranged to gradually change in its visual characteristics so that it cycles through the entire range of characteristics every 12 or 24 hours or other suitable time period. The visual characteristics of the first region can be arranged to form an endless loop which is either fixed in position, or is arranged to shift its visual characteristics as well, so that each point across or along the region is arranged to cycle through the characteristics, say, once every 28 days or once every 365 days. The shift of the first region over 28 days or 365 days is in the opposite direction to its shift relative to the second region for time. This means that, for a particular time of day, the visual characteristics will be different except for every 28 or 365 days. This change in characteristics day by day, by cycling through the range of visual characteristics every 28 days gives a lunar phase aspect to the display of the clock, and every 365 days gives an annual phase aspect to the display of the clock.

In a second preferred arrangement, the second region is arranged to have a substantially fixed visual characteristic, and the first region is arranged to gradually change in its visual characteristics over time so that it cycles through the entire range of characteristics every twelve or twenty-four hours, or other suitable time periods. The change in visual characteristics is a gradual shifting of the visual characteristics along the first region. Where, for example, the first region is longitudinal in orientation, the visual characteristics will gradually move along the region. Where the first region is arranged in a ring, the visual characteristics are arranged to move gradually around the ring.

In either the first or second preferred arrangements, the period of a cycle of the visual characteristics can be arranged to be any period that is desired. Usually, it is likely to be 24 hours, but could be eight hours, being a typical working day, 12 hours, 28 days, the lunar cycle, or 365 days, the length of one year.

Other cycles can be programmed into the clock such that the period can be adjusted to the task which the user of the clock is involved in. For example, if a person is travelling from London to New York, and the journey time is 6 hours, the clock can be arranged to cycle through the entire range of visual characteristics in that 6 hours.

It is also preferred that the clock includes a global positioning device and means for shifting the relative positions of the first region and the second region according to the global latitudinal position and to take account of the different time zones at different world latitudes. This can be used to automatically change the display to indicate the correct time in different latitudinal positions of the world. Therefore, when the user travels from London to New York, instead of cycling through the entire range of visual characteristics, the characteristics will shift gradually to take account of the user's position in the world, so that on arrival in New York, the correct time is shown. In view of the fact that this is linked to colour, the gradual change in colour can assist in the user coping with changes of time zone.

To aid the identification of the alignment point, it is very much preferred that the first region is arranged to have an edge along which the visual characteristic changes, and next to which the second region is arranged. Advantageously, the first region forms a ring within which the second region is located. This allows the clock to be displayed in a simple, easy to read manner.

According to one form of the invention, the clock includes a bevel, the bevel constituting the first region.

The gradually changing visual characteristics can be any one of a number of different characteristics, preferably colour hues. Alternatively, the characteristics could be grey shades.

Where colour hues are used as the visual characteristics, and this is very much preferred, it should be noted that changes in colour hue are often measured in degrees. It is preferred that the degree of change of colour hue correspond to the degree of

change around the clock face. Therefore, if 24 hours are shown in one 360° circuit of the face of a clock, the colour hue will change by 1° for every 4 minutes, corresponding to a 1° movement around the clock face. Of course, if one 360° degree rotation corresponded to one 12 month period, a 1° change of colour hue will occur in just over 24 hours. Thus, if the colour hue at the alignment point changes for each degree of rotation around the clock face, 360 different colours will need to be displayed. A higher resolution can be obtained if more colours are able to be displayed.

It is also possible to arrange the clock as an icon or button for selection of computer software, or of a link to an internet website.

According to a second aspect of the invention, a clock comprises a time display, means for holding a gradually changing range of visual characteristics, and means for causing the display to exhibit the gradually changing visual characteristic from the said holding means whereby the visual characteristic exhibited by the time display is indicative of the time. Preferably, the time display is a lamp unit arranged to display the visual characteristics in the form of colour hues.

Embodiments of the present invention will now be described by way of example only with reference to the drawings in which:

Figure 1 shows a clock face according to the present invention in which midnight is shown;

Figure 2 is a clock face according to the present invention in which midday is shown;

Figure 3 is a clock face according to the present invention in which 6 pm is shown;

Figure 4 is a clock face according to the present invention in which 6 am is shown;

Figure 5 is a linear clock face according to another embodiment;

Figure 6 is the face according to Figure 5 showing noon;

Figure 7 is the face according to Figure 5 and 6 showing 6 pm; and

Figure 8 is the face according to Figures 5 to 7 showing midnight.

According to a first embodiment of this invention, which is shown in Figures 1 to 4, a clock 1 is shown indicating four different times. The clock includes a clock face 2 made up of a first region 3 in the form of an outer ring around the clock face 2, and a second region 4 which is a circular area of the clock face, the outer edge of which abuts or is positioned very close to the first region 3. Around the outside of the clock face are numbers 5 corresponding to the time. In this embodiment, a 24 hour clock is shown with all twenty-four hours shown around the clock face 2. Of course, the numbers 5 can be part of the clock face, or could be separate to it. Since all twenty-four hours are indicated in one 360° loop, not every hour is marked by a number, but every two hours. This is merely to prevent overcrowding of the clock face 2.

Although, in this embodiment, 24 hours are covered in a single cycle through the range of visual characteristics, different time periods are also possible. For example, the period of the cycle can be twelve hours which will allow the clock to be read in a similar manner to a conventional watch where midday and midnight are indicated at the top, and 6am and 6pm are shown at the bottom of the clock face 2. Alternatively, other time periods can be used. For example, the length of the cycle can be made to be the same as the lunar cycle, every 28 days. Another alternative is to make the period of the cycle 365 days in order to correspond with the length of a year. Shorter periods can also be shown. For example, the clock can be arranged such that the period of the cycle is 1 hour, or 8 hours corresponding to the length of the working day. The period can also be customised to particular activities, for example, if a user is to take part in an activity which will take a predetermined amount of time, such as an airline flight. In addition, of course, where an airline flight crosses time zones, the speed of change of the colour hues can be altered to take account of the changes of time zone. For example, if flying from New York to London, the colour hues will change more quickly to take account of the fact that the user is not only travelling for some hours, but is also crossing five time zone boundaries, effectively adding five hours to the time. Flying in the opposite direction, the change of colour hues will be slower than normal. Further aspects of this are discussed later on.

The visual characteristics of the first region 3 change gradually and continually around the clock face 2. The preferred visual characteristics are colour hues. Therefore, in this embodiment, at the mid day position (0°) the colour is red, as shown in Figure 2. At 3 pm (45°) the colour is pink; at 6 pm (90°) the colour is indigo, as shown in Figure 3; at 9 pm (135°) the colour is blue; at midnight (180°) the colour is aqua, as shown in Figure 1; at 3 am (225°), the colour is green; at 6 am (270°) the colour is orange, as shown in Figure 4; and at 9 am (315°) the colour is yellow. Between those colours, the visual characteristic gradually changes towards the next colour so that a smooth colour transition occurs. Every point around the first region is a different colour or has a different characteristic from every other point. The actual number of different colours shown are expected to be very great so that, for example, if the clock 1 is displayed on a computer screen, typically 16 million different colours are available for use, although rather fewer colours are likely used in practice. Colour hue can also be described as changing in degrees. The degrees of change of colour hue will correspond to the degrees around the clock face 2. Thus, where 24 hours are shown in one 360° revolution of the clock, each degree of the clock face corresponds to 4 minutes, and to 1° of change of colour hue. The colour hue can be arranged to change every 4 minutes where 360 different colours are available, or more frequently when more colours are available. In this embodiment, the first region 3 is fixed in its angular position, and always remains the same. However, other embodiments are discussed below where the first region may be shifted or altered over time.

The second region 4 which is located centrally of the first region 3, is an area of the clock face which at any particular time exhibits the visual characteristic of a part of the first region 3. For example, in Figure 1, the visual characteristic of the second region 4 is the same as that of the first region 3 at the position of midnight. During the day, the second region 4 changes its visual characteristic along the graded visual characteristics of the first region 3 such that it always matches the visual characteristic of the first region at a point, which is the alignment point 6. In the drawings, the alignment point 6 is indicated by an arrow. Thus, as the time passes midnight, the visual characteristic of the second region 4 gradually changes from aqua to green at 3 am to orange at 6 am, to yellow at 9 am, to red at noon, to pink at 3 pm, to indigo at 6 pm, to blue at 9 pm and

back to aqua at midnight. As the visual characteristic of the second region 4 changes, the position of the alignment point moves clockwise around the clock face such that the time is indicated by the position of the alignment point relative to the numbers.

The colour of the second region 4 at a particular time of the day can be arranged to be linked to a person's mood at that time of the day, colour being closely linked to psychological mood, and mood being associated with the time of day. In addition, the position of the alignment point may be made more accurate by the use of a greater number of colours around the first region 3. Clearly, if the number of colours used around the first region were 32, one would be able to read the clock quite accurately. However, if the range of colours shown in the first region were 2048, the accuracy of the clock would be very much greater.

In the embodiment described above, the outer ring or first region 3 is indicated to be substantially fixed and the second region 4 changes colour to indicate the time by the position of the visual characteristic match between the second region 4 and the first region 3. However, the second region could remain the same all the time, with the first region 3 rotating such that the alignment point 6 moves by virtue of the rotational movement of the first region with respect to the second region. For some clocks, this will be preferred since a changing colour display may be difficult or expensive to manufacture in, for example, a watch.

The watch and clock embodiments could be arranged to be mechanical whereby a circular bevel, which forms the first region 3, is rotated against a second region of a fixed colour.

A further feature which can be included in the above embodiments allows the combination of more than one time to be displayed. For example, the lunar cycle can be used to alter the operation of the clock. Whilst in the embodiment of Figures 1 to 4, the first region 3 is fixed, and the second region 4 changes over 24 hours in its visual characteristics, if the lunar cycle is also to be used, the first region 3 can be arranged to rotate counter-clockwise over a period of 28 days, the period of a lunar cycle. This

means that the visual characteristic or colour shown in the second region at a particular time will be different each day. For example, on a full moon, the colour shown at midnight might be aqua, but a few days later will be green and so on until the next full moon in which the colour shown at midnight would again be aqua. The alignment point 6 at the same time each day during that phase would be in the same position, or would correspond to the same number around the edge of clock face 2.

Other phases such as solar phases and individual biorhythms could be used in the place of the lunar cycles.

In addition, another particularly useful feature is a global positioning device for identifying the latitude of the clock. On the basis of the global latitude, the visual characteristics of the first region are rotated in order to ensure that the correct time and visual characteristic is shown according to the latitudinal location of the device in the world. This can be incorporated with the arrangement described above, where the colour hues change faster or slower than normal, depending on direction of travel, or can just be arranged to change the indicated time.

The arrangement of the features of the clock can be arranged differently. For example, in the first embodiment, the outer ring, which is the first region, is filled by the second region 4. That second region 4, rather than being a complete circle, could be a ring having a particular visual characteristic which is located on the inside of the first region. In an alternative embodiment, the ring of the second region 4 could be located outside the first region 3. Further, in another embodiment, the first region 3 can be arranged to be linear rather than circular. The second region 4 would be arranged adjacent to the first region so that the alignment point 6 moves linearly over time rather than in a circle. The numbers 5 can be arranged along the linear first region. Of course, other shapes of first region could be used.

In addition, the clock can be produced in several forms. The clock can be constructed so as to be worn as a wrist watch, or so as to be placed in a prominent position in a room, such as hanging on a wall. A suitable clock face is required for indicating the

time which is able to display the required colours. In practice, this might need to be carried out on some form of screen, such as a liquid crystal or cathode ray screen. Liquid crystal screens are now available which would be suitable for use in a watch. Alternatively, the clock could be placed on the screen of a personal organiser, laptop computer or other computer screen. The clock can be arranged to be visible throughout the use of such machines, and would be a very pleasing way of indicating the time. In that case, the creation of the clock face on screen would be software driven.

Referring now to Figures 5 to 8, a time line 10 is shown which is linear. The left-hand end of the time line corresponds to midnight or 1 am. The time line includes a longitudinal first region 11 which changes in visual characteristics along its length. Adjacent the first region 11 is a second region 12 which has a particular visual characteristic from the visual characteristics of the first region 11. The point 13 at which the two regions 11, 12 exhibit the same visual characteristic indicates the time of day. The visual characteristics of one or both of the regions changes over time, such that the alignment point moves over time. The second region 12 can change in visual characteristic over time so that the alignment point 13 moves with time, and the visual characteristics of the first region 11 can move along the line 10, thereby moving the position of the alignment point 13 relative to the second region 12.

With reference to Figure 5, at 6 am, the visual characteristic of the second region is the same as the first region at the point at which the alignment point 13 is indicated, where 6 am is indicated by a time index or marking along the bottom of the time line 10. Over the following few hours, the visual characteristic of the second region gradually changes over time until, at noon, the visual characteristic is the same as the visual characteristic of the first region at the position indicated by the number 12, which forms the alignment point 13 in Figure 6. In the time between 6 am and noon, the visual characteristic of the second region 12 changes following the changes in visual characteristics along the first region from the position at 6 am to the position at noon. During the day, the visual characteristic of the second region will continue to change until, at 6 pm, as shown in Figure 7, the visual characteristic is the same as the visual characteristic adjacent the 6 pm mark, the alignment point 13. In Figure 8, midnight is

shown, in which case the visual characteristic of the second region has moved to being the same as that of the first region at the point indicated by midnight, and the alignment point is indicated by arrow 13. After that time, the alignment point will return to the left hand side of the linear time line and work its way along to the right.

Of course, some of the other enhancements which are referred to with respect to the embodiment shown in Figures 1 to 4 apply equally well to this embodiment. Therefore, different time periods can be shown along the time line, and other aspects such as the movement of the visual characteristics along the second region are possible in line with what has been disclosed in relation to the embodiments of Figures 1 to 4.

According to another embodiment of the invention (not shown), a time display can be made which gradually changes its visual characteristic over time, but which does not include a second region against which an alignment point is created. In this case, the time of day would be indicated by the visual characteristic, such as colour hue, and the time display might be a lamp for lighting a room or part of a room with the colour which is indicative of the time of day. That lamp could be a wall mounted, table mounted or floor standing lamp unit with a light source able to display the required colours of the visual characteristics. The display could be a colour computer screen which changes in background colour over time. It will require a colour controller which causes the displayed colour to change, and which effectively stores the colour hues which are cycled through.

One other important aspect of the second embodiment of this invention is that, when the clock is shown on a screen, it may also be used to select the operation of a piece of software or to operate as a link to a web site. Thus, the clock may cover a small area of the screen, perhaps in a corner. By moving a pointer to the clock, it can be clicked so as to select that clock. The clock, therefore, forms an icon whereby embedded controls select software, or cause software such as internet explorer to be opened, prompting access to the internet, and selecting a particular web site on the internet. In addition, each of the colours of visual characteristics of the clock can relate to different pieces of software, or to different web pages. The visual characteristics selected can be

appropriate to the matter being selected. This is particularly useful where the clock is displayed on a computer, or even on an interactive television.

Claims

1. A clock comprising:

a first region across or along which there is a gradual change in visual characteristics; and

a second region which has the visual characteristic of a point across or along the first region which is an alignment point;

wherein at least one of the first and second regions are arranged to be gradually changeable to shift the visual characteristics relative to the other to move the position of the alignment point on the first region, whereby the time is indicated by the position of the alignment point.

2. A clock according to claim 1, further comprising a time scale indicated along either the second region or the first region against which the alignment point can be compared.

3. A clock according to claim 1 or 2, wherein the second region gradually changes in its visual characteristics, and is arranged to cycle through the entire range of characteristics every twelve or twenty-four hours or other suitable time period.

4. A clock according to any one of the preceding claims, wherein the visual characteristics of the first region is arranged to form an endless loop.

5. A clock according to any one of the preceding claims, wherein the first region is arranged to shift its visual characteristics so that each point across or along the region is arranged to cycle through the characteristics, say, once every 28 days.

6. A clock according to claim 5, wherein the shift of the first region for 28 days is in the opposite direction to its shift relative to the second region for time.

7. A clock according to any one of the preceding claims, further comprising a global positioning device, and means for shifting the relative positions of the first region and the second region according to the latitudinal position, and to take account of the different times at different world latitudes.

8. A clock according to any one of the preceding claims, wherein the first region is arranged to have an edge along which the visual characteristic changes, and next to which the second region is arranged.

9. A clock according claim 8, wherein the first region forms a ring within which the second region is located.

10. A clock according to any one of the preceding claims, further comprising a bevel, the bevel including the first region.

11. A clock according to any one of the preceding claims, arranged as a conventional analogue clock in which twelve hours are indicated around the rim of the clock face.

12. A clock according to any one of the preceding claims, wherein the gradational visual characteristics are colour hues or grey shades.

13. A clock according to any one of the preceding claims, wherein the clock constitutes an icon for selection of computer software, or an Internet website.

14. A clock comprising:

a time display;

means for holding a gradually changing visual characteristic; and

means for causing the display to exhibit the gradually changing visual characteristic from the said holding means whereby the visual characteristic exhibited by the time display is indicative of the time.

15. A clock according to claim 14, wherein the time display is a lamp unit arranged to display the visual characteristics in the form of colour hues.

5

INVESTOR IN PEOPLE

Application No: GB 0023451.8 **Examiner:** Dave McMunn
Claims searched: 1-13 **Date of search:** 1 August 2001

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): G3T (TA4B1, TA4B2, TA4B3, TA4B4A, TA4B4B).

Int Cl (Ed.7): G04B 19/00, 19/04.

Other: ONLINE : WPI, EPODOC, JAPIO.

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2,275,353 A	(CHROME MECHANICS). See whole spec	1, at least
X	EP 0,492,027 A1	(ARCHEMEDIA CREATION). See whole spec	1, at least
X	WO 99/57614 A1	(DESAIN). See whole spec.	1, at least
X	US 5,636,185	(BOIT). See whole spec.	1, at least
X	CH 613,587	(HARLAN). See whole spec.	1, at least
X	DE 29704001 U	(BAKAY). See whole spec.	1, at least
X	DE 19535885	(KONRAD). See whole spec.	1, at least
X	DE 29621215 U	(WARENHANDELS). See whole spec.	1, at least
X	DE 3,142,478	(EUROSIL). See whole spec.	1, at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Application No: GB 0023451.8
Claims searched: 14, 15

Examiner: Dave McMunn
Date of search: 22 August 2001

Patents Act 1977
Further Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): G3T (TA4B5, TA4B2, TA4B4A, TRA).

Int Cl (Ed.7): G04B 19/34, 45/00.

Other: ONLINE : WPI, EPODOC, JAPIO.

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2,281,420 A	(CENTRAL PLAZA). See Figs	14,15
X	GB 2,259,160 A	(RUGGE-PRICE). See Figs	14,15
X	GB 2,202,972 A	(HAVEL). See Figs	14,15
X	GB 2,186,400 A	(HAVEL). See Figs	14,15
X	GB 1,567,514	(NIPPON TELE). See whole disclosure	14,15
X	US 5,289,301	(BREWER). See Figs	14,15
X	US 5,228,013	(BIK). See Figs	14,15
X	US 3,854,279	(EDMUNDS). See Figs	14,15
X	JP 61207980	(SUGITA). See Figs	14,15

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.