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DEVICE FOR POSITIONING COLORIMETER CELLS

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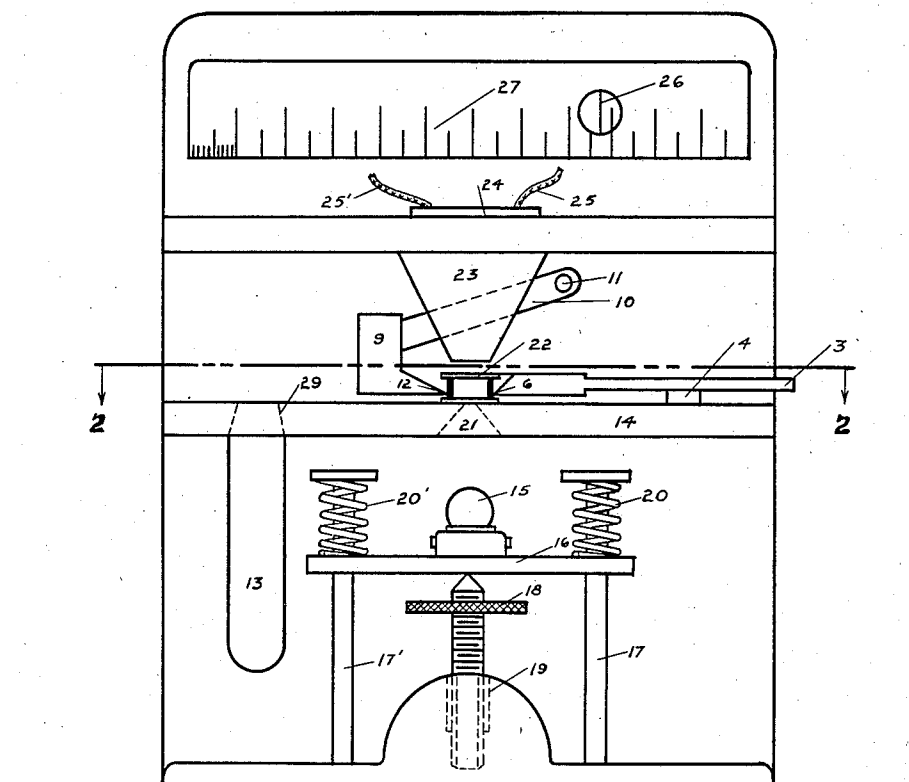


Fig. 1

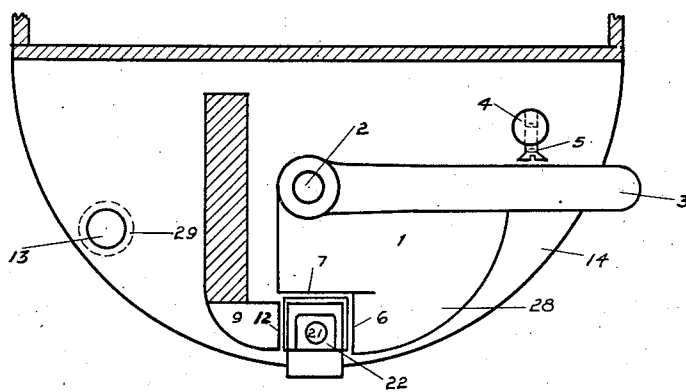


Fig. 2

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DEVICE FOR POSITIONING COLORIMETER CELLS

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3 Claims. (Cl. 88—14)

This invention relates to a device for positioning colorimeter cells.

One of the objects of this invention is to provide a simple means for properly positioning the colorimeter cell in the light beam of a photoelectric colorimeter.

Another object is to provide a means of securing the cell in place, once the proper position has been obtained.

A further object is to provide simple means for release of the cell after use. A still further object is to provide means for ejecting the used cell into a suitable receptacle against future disposition.

One form of the device of this invention is illustrated by the attached figures, of which:

Figure 1 illustrates the device in front elevation showing the means for positioning and securing the cell.

Figure 2 is a plan view along line 2—2 of Figure 1.

Like numerals designate like parts throughout the several drawings.

The device consists of a holder member designated generally as 1. The member 1 is pivoted at 2 to admit of circular motion. A handle 3 is grasped by the hand when it is desired to move the holder member about pivot 2. A stop post 4 is so positioned that it restricts the motion of 1 in a counter-clockwise direction. Arresting post 4 is provided with an adjustable screw 5, which may be screwed in or out, thus providing adjustable means for bringing holder member 1 into proper position when handle 3 is rotated in a counter-clockwise direction.

Holder member 1 is provided with an opening forming two sides of a square for receiving the colorimeter cell and bringing it into proper alignment. The side 6 of this square is given a sharp edge through beveling. Side 7 of the square opening need not be beveled.

A securing member 9 consists of a metal casting having substantial weight. An arm 10 extending from 9 co-operates with a stud 11, said stud acting as a pivot about which 10 may be turned. This securing member 9 serves to hold the colorimeter cell in place by exerting a side pressure on the cell. The edge of the securing member which contacts the colorimeter cell is also beveled, as indicated by 12. Member 9 is so suspended from stud 11 that the beveled edge 12 occupies the same horizontal plane as the beveled edge 6 of the holder member 1.

If the beveled contact edges 6 and 12 were not in the same horizontal plane there would be a force tending to turn the colorimeter cell. Should

this occur the light path through the cell would be increased and an error in the reading of the instrument would occur. The beveled construction allows precise location of the holding force applied to the side of the cell.

A removable receptacle 13 provided in shelf 14 is so positioned that when securing member 9 is moved upward by turning on stud 11 and handle 3 is rotated in a clockwise direction, the cell then in the device is ejected therefrom and drops into receptacle 13.

The many advantages of this device, particularly when used with colorimetric cells covered by my U. S. Patent #2,258,073, become obvious on a description of its operation with a suitable photoelectric colorimeter.

The light source of such a colorimeter is a small incandescent bulb 15 mounted on a movable platform 16. This bulb can be operated from a storage battery.

The movable platform slides on posts 17 and 17' by turning screw wheel 18. This screw wheel is mounted in threaded hub 19. Pressure from springs 20 and 20' gives a smooth motion to the movable platform 16.

Light from the bulb passes through conical opening 21 to reach the colorimeter cell 22. A small hole in the tip of hollow cone 23 allows light to enter and illuminate photocell 24. This photocell is connected to a galvanometer by leads 25 and 25'. Motion of the galvanometer is indicated by hairline 26 and a scale 27.

In using such an instrument, it is necessary to check frequently the zero position of the galvanometer, by cutting off the electric current through the galvanometer.

This is readily accomplished in the device of this invention by rotating the holding member 1 in a clockwise manner. When this is done, solid portion 28 of the holding member moves under the tip of the hollow cone, thus intercepting the light beam to the photocell. Under these conditions the galvanometer hairline should return to zero, or the necessary adjustment can be made.

To make a colorimeter reading the holding member 1 is rotated against stop 4, and a colorimeter cell 22 is placed in the square opening of 1, while securing member 9 is held to one side by hand. The securing member is then released, bringing the colorimeter cell into correct position in the light beam by forcing the cell against beveled edge 6 through side pressure from edge 12. The colorimeter cell is thus positioned with little effort, which is a great convenience when many readings are required.

Light now passes through the colorimeter cell to the photocell, causing the galvanometer to deflect. Full scale deflection is obtained by proper positioning of the light bulb 15 by turning screw wheel 18. The liquid, whose light absorption is under test, is introduced into the colorimeter cell from a pipette. The colorimeter cell being of small dimensions retains the liquid by capillary action. The galvanometer now has a smaller deflection determined by the amount of light absorbed by the liquid in the cell.

During this filling operation, the cell is held securely in position, by pressure, between the securing member and the holding member.

Upon completing a reading, the colorimeter cell can be instantly released by raising securing member 9 by hand. The used cell can then be drawn directly out of the instrument with the other hand. However, a more convenient method of disposal is to eject the cell into receptacle 13. This is accomplished by raising securing member 9 with one hand and rotating holding member 1 with the other hand in a clockwise direction. The colorimeter cell, which may be of non-fragile plastic material, then drops into receptacle 13. This receptacle is held in platform 14 by a friction fit in tapered hole 29. After the receptacle is filled with cells, it is readily removed and the cells, which are inexpensive, can be discarded.

As previously mentioned, each time a cell is ejected in the above manner the zero point of the galvanometer is automatically checked by interception of the light beam to the photocell.

The novel features of this invention provide a simple and convenient means for holding and ejecting colorimeter cells in a photoelectric colorimeter, especially when these cells are of small size and constructed from non-fragile, plastic materials.

What is claimed as new and useful and to be secured to me through Letters Patent, is given by the appended claims.

I claim:

1. In a colorimeter which has a light affected meter, a light-beam projecting light and a platform with an aperture in the path of the light-beam adapted to carry a sample holder thereon, means for acting on a sample holder to position and releasably retain the holder in a predetermined location on the platform in alignment with the aperture and in the path of the light-beam, said means including in combination holder means on said platform on one side of said light-beam path, securing means having a body portion, and means mounted above said platform pivotally supporting said body portion in a manner to permit pivotal movement thereof downwardly on the other side of the light-beam path and toward said holder means to engage and position a sample holder in the light-beam path against said holder means and retain the sample holder in

such position to affect the light-beam intensity for a reading on the meter, said body portion being movable upwardly and away from the sample holder for release of the latter, and said holder means being mounted for movement parallel to said platform and across the aperture therein to move a positioned sample-holder away from said aperture.

2. In a colorimeter having a meter, a source of light to project a light-beam in a path and means responsive to the intensity of the light-beam for operating the meter, means for supporting and positioning a sample holder in the light-beam path, said supporting and positioning means including in combination an apertured platform with the aperture positioned in the light-beam path, holder means on the platform for retaining a sample holder supported by said platform in alignment with said aperture against movement in one direction, securing means pivotally supported above the platform in a position to move downwardly and toward the light-beam path to bear against the sample holder and urge the latter toward the holder means, a sample-holder disposal receptacle mounted in the platform, and means pivotally supporting the holder means for movement in a direction substantially parallel to the platform and across the aperture therein to project the used sample holder into the receptacle.

3. In a colorimeter, the combination including a meter having a "no-light" reading, a source of constant light projecting a light beam in a path, photo-cell means responsive to the intensity of the light in the light-beam for operating the meter, a platform having an aperture in the light-beam path, walled hollow means mounted between the aperture and the photo-cell means to shield said photo-cell means from extraneous light, said walled means permitting the passage of light therethrough from the aperture to the photo-cell means and spaced from the platform sufficiently to permit the insertion of a sample holder therebetween, movable sample-holder-positioning-and-securing means having a portion on each of two opposite sides of the light-beam path and each portion being movable toward and across the light-beam path, one of said portions having an opaque part movable upon movement of said portion substantially parallel to the platform and between the platform and walled means into a position to shut off the light-beam completely prior to insertion of a sample holder in the colorimeter and to permit the operator to observe the "no-light" reading of the meter, and the other of said portions being mounted for movement away from the aperture and out of the path of said one portion to permit movement of said one portion and the opaque part thereof into said position for intercepting the light-beam.

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