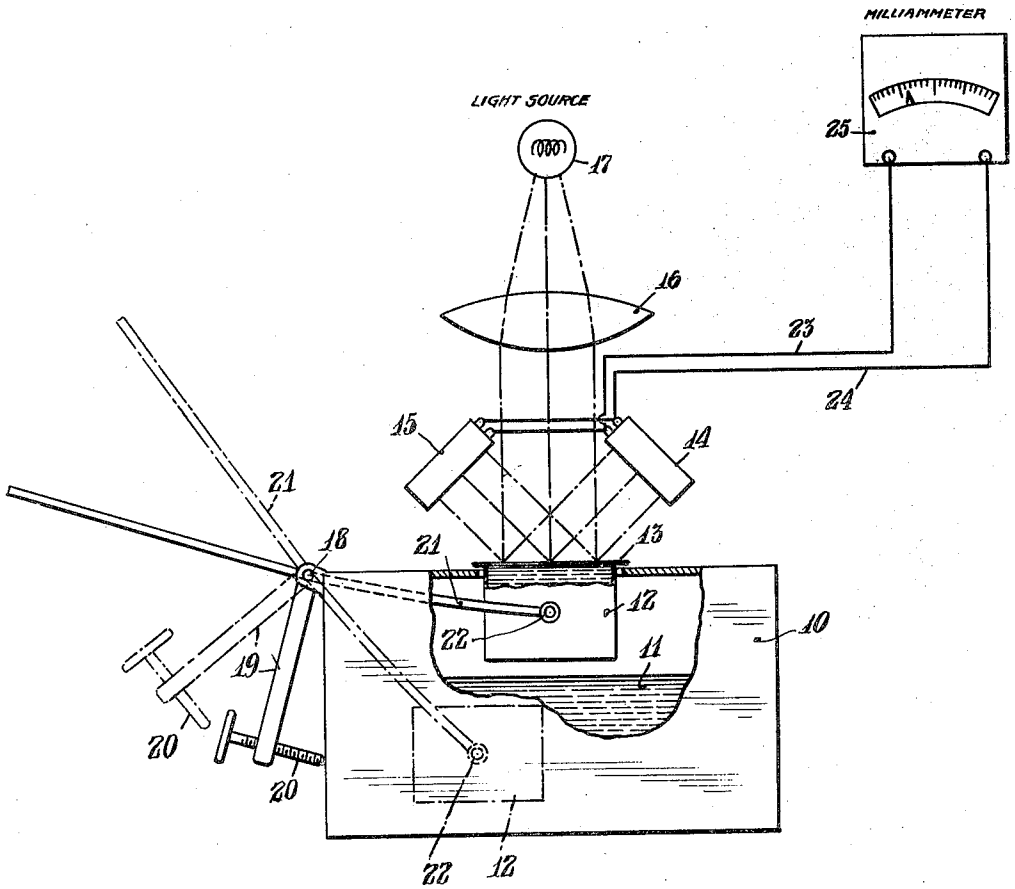
Nov. 17, 1936. C. E. TARVIN ET AL 2,060,957

MECHANISM FOR MEASURING COLOR CHANGE

Filed Jan. 25, 1934



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Patented Nov. 17, 1936 2,060,957

UNITED STATES PATENT OFFICE

2,060,957

MECHANISM FOR MEASURING COLOR CHANGE

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Application January 25, 1934, Serial No. 708,182

2 Claims. (Cl. 88—14)

This invention relates to a new and improved mechanism for testing the power of paper and other absorbent material, to absorb fluids such as ink and the like.

One of the objects of the invention is to provide a mechanism for testing the facility with which newsprint paper absorbs printing ink.

Another object of the invention is to utilize one or more photoelectric cells in making such test.

Another object of the invention is to provide mechanism of great simplicity and which will operate uniformly.

Other objects of our invention will be set forth in the following description and drawing which illustrates a preferred embodiment thereof, it being understood that the above statements of the objects of our invention are intended to generally explain the same without limiting it in any manner.

The annexed drawing is an elevation, partially in section, which diagrammatically illustrates one form of apparatus which may be used for carrying out the invention.

A suitable supply of the printing ink 11 is contained within a suitable vessel or container 10. The vessel 10 may have a cover, and said cover is preferably imperforate, save for an opening over which the piece of paper 13 is applied. This piece of paper 13 is larger than said opening so that the edge of said piece of paper is supported upon the top of the cover. Said cover may be removable or the container 10 may be provided with a filling opening, which can be closed by means of any suitable plug.

The piece of paper 13 is of planar shape and the opening in the cover is made sufficiently small, and the piece of paper 13 is made sufficiently small, so that the inherent rigidity of the piece of paper will maintain the same in planar shape, although said piece of paper is unsupported, save at the edge portion thereof.

A pot 12 is movably located within the container so that said pot 12 can be moved up and down. Any suitable means may be employed for this purpose. For example, the pot 12 can be connected at 22, to a lever 21, which is pivotally connected at 18 to a suitable lug which projects from, or which is affixed to the container 10. Said lever 21 is rigid with an arm 19, to which a stop screw 20 is adjustably connected.

The pivot pin 22 may pass through the front and rear walls of the pot 12 and any suitable auxiliary means may be provided for maintaining the top of the pot 12 in horizontal position, as the same is moved up and down.

The weight of the ink within the pot 12 is normally sufficient to maintain the top of the pot 12 horizontal, as the same is moved up and down. However, any suitable guide or guides may be employed for this purpose.

In the dotted line position of the lever 21, the pot 12 is below the top of the ink 11. In the full line position of the lever 21, the pot 12 has been raised until the ink which is located within the pot 12, contacts with the piece of paper 13.

In operating the device the pot 12 is first submerged in the ink 11 and the pot 12 is then raised until its top is above the ink 11. The pot 12 is held in this intermediate position until the surplus ink has flowed out therefrom.

Due to the surface tension of the ink, the top surface of the ink which is now located within the pot 12, projects slightly above the top of said pot 12. The meniscus of ink which is thus formed at the top of the pot 12 is substantially planar, save for its edge portion, said edge portion being slightly convex.

When the pot 12 is now raised to the full line position shown in the drawing, the piece of paper 13 floats upon the top of said meniscus, and the paper absorbs the ink with a rapidity which depends upon the quality of the paper. This rapidity may be designated as the rate of absorption.

It will be noted that the piece of paper 13 rests freely upon the top of the container 10 as there is nothing to clamp or otherwise hold it in position. Hence the piece of paper 13 may be slightly raised from the top of the cover of the container 10, when the pot 12 has been raised to its top position.

The limit of the upper movement of the pot 12 is determined by the adjustment of the screw 20 as the tip of this screw 20 abuts the side wall of the container 10, when the pot 12 is in its top position.

We do not wish to exclude from the scope of the invention a device in which the piece of paper is clamped or otherwise held to the cover of the container 10 or to any other suitable support, but we prefer to have the piece of paper 13 rest freely upon the cover of the container 10, or upon any other suitable support.

Light is supplied from any suitable source 17 which may be an incandescent bulb or the like. A condenser lens 16 produces a pencil of parallel beams of light, which falls upon the piece of paper 13. The piece of paper 13 is scanned by means of a pair of photoelectric cells 14 and 15. We can use one such photoelectric cell or more than two of such photoelectric cells, as the use of two

such cells is merely illustrative. The photoelectric cells 14 and 15 have been conventionally illustrated as such cells and their accompanying electric circuits are well known per se.

The reading of the electric current which passes through said cells 14 and 15, is secured by means of a milliammeter 25, which is connected to said cells by means of leads 23 and 24.

The piece of paper 13 is white and as it absorbs the ink it gradually darkens and the change in color or shade can be accurately determined by the reading of the meter 25.

If desired, the observer can use a stop watch and he can observe the lowering in the reading of the meter 25, during the predetermined time period.

Any suitable means may be provided in the electric circuit of a photoelectric cell or cells, in order to automatically control, and compensate for, any fluctuation in line voltage.

Likewise an automatic stop clock, which is operated by means of an electric circuit, can be utilized and the electric circuit of this automatic stop clock device can be closed when the lever 21 has been moved to the full line position. Likewise a recording meter can be utilized and any other suitable means may be utilized for observing the absorption of the ink by the paper. Likewise penetration curves may be made directly, in order to provide comparative studies of the paper. When the photoelectric current reaches a predetermined value, said current can operate a relay which opens the circuit of a stop clock.

Since the apparatus which is disclosed herein provides a simple and efficient means for measuring the rate of change of color or shade, suitable color filters may be utilized for measuring the change in light intensity of any wave length of light. Likewise the instrument may be used for measuring the penetration of dyes into fabrics, the rate of ripening fruits and vegetables, and for numerous other purposes.

Likewise, whenever we refer to a photoelectric cell or cells in the description or claims, we wish to include suitable photo-metric devices such as the Martens photometer.

We have shown a preferred embodiment of our invention, but it is clear that numerous changes and omissions can be made without departing from its spirit.

We claim:

1. A device for determining the absorption of a liquid coloring medium by porous material, comprising a support for the porous material to be tested, photoelectric means for scanning the piece of material, a vessel movably mounted below the material and adapted to hold a confined mass of the liquid coloring medium, and means for moving said vessel upwardly towards said support so that the coloring medium in said vessel can be caused to contact with the porous material.

2. A device for determining the absorption of a liquid coloring medium by porous material, comprising a support for the porous material to be tested, photoelectric means for scanning the piece of material, a vessel movably mounted below the material and adapted to hold a confined mass of the liquid coloring medium, and means for moving said vessel upwardly towards said support so that the coloring medium in said vessel can be caused to contact with the porous material, said porous material being freely located on said support.

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