May 1, 1945. J. P. VOLLRATH 2,374,847

SAMPLING METHOD

Filed Nov. 7, 1941

FIG. 7.

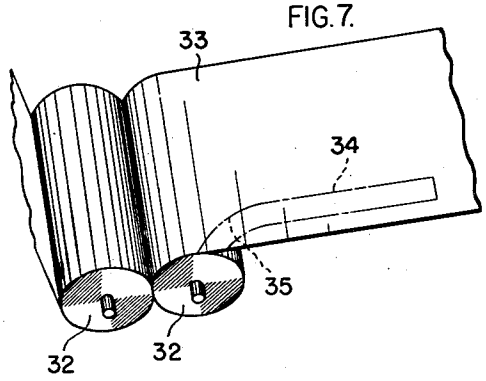



FIG. 2.

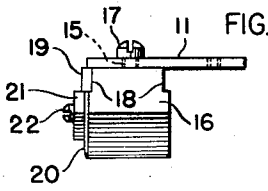



FIG. 1.

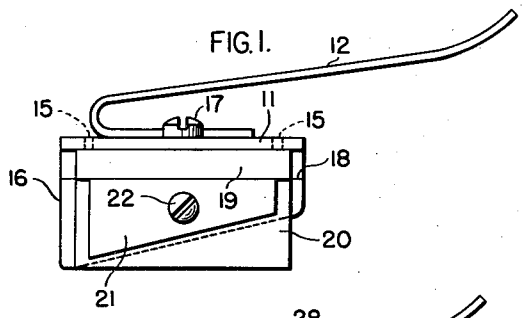



FIG. 3.

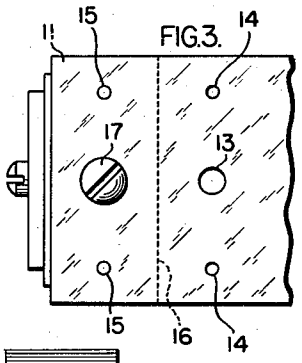



FIG. 4.

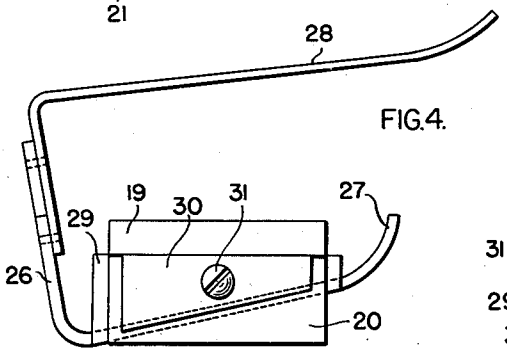



FIG. 5.

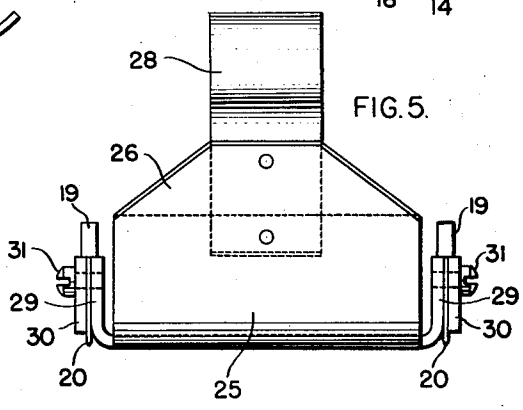
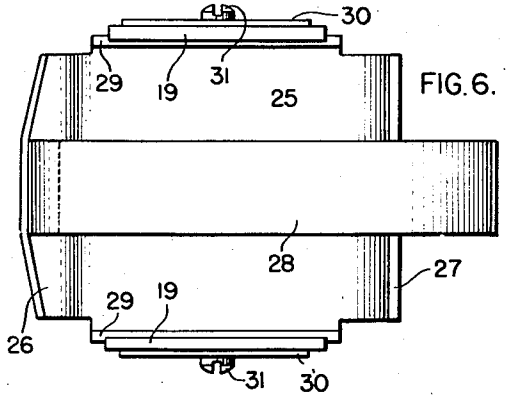



FIG. 6.

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# UNITED STATES PATENT OFFICE

2,374,847

## SAMPLING METHOD

Joseph P. Vollrath, Glenside, Pa., assignor to The Brown Instrument Company, Philadelphia, Pa., a corporation of Pennsylvania

Application November 7, 1941, Serial No. 418,185

2 Claims. (Cl. 73—421)

The present invention relates to testing and more particularly to a method whereby a sample of paper may be removed from any portion of a sheet or web as it is being formed. This sample is then tested for its moisture content.

In checking the moisture content of paper it is customary to take a sample of the paper as it is received and weigh it. This gives the wet weight. The paper is then heated to drive off the moisture until it is bone dry, and reweighed. With the wet and dry weight its moisture content in percent of weight can readily be computed.

Obtaining an accurate moisture check on paper as it comes off a dryer particularly when the dryer is in operation is one of the most difficult procedures in a paper mill. Under adverse conditions the moisture in a sheet of paper may change as much as two precent within a minute. Therefore the utmost speed must be used in taking the sample and placing it in an air-tight sample drying can. It is because of the rapidly changing moisture content of paper and because of the speed that is necessary in handling the sample and getting it into the sample can that samples are generally taken at the edge of the web, where conditions are not indicative of conditions at the center of the web. Another difficulty is that unless the greatest care is exercised the web is liable to be broken since a fast traveling web of paper is readily torn.

It is an object of the invention to provide a method of rapidly taking samples of a web of paper from any point across the width of the web as it is moving through a paper making or using machine. This method insures that the sample will be taken from the web and enclosed in its drying container in an absolute minimum of time, and that the web will not be broken as the sample is being taken.

It is a further object of the invention to take a sample of a moving web of paper with a novel cutting device that was specifically designed for this purpose. By the use of the new cutting device a method of taking a paper sample has been devised in which a sample may be obtained from any point of a moving web in the least possible time and without any danger of breaking the web.

The various features of novelty which characterize this invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, its advantages and specific objects obtained with its use, reference should be had to the accompanying drawing and descriptive matter in which is illustrated and described a preferred embodiment of the invention.

In the drawing:

Fig. 1 is a side view of one form of cutting tool,

Fig. 2 is a partial view taken from the right of Fig. 1.

Fig. 3 is a partial plan view of Fig. 1,

Fig. 4 is a side view of another form of cutting tool,

Fig. 5 is a view taken from the left of Fig. 4,

Fig. 6 is a plan view of Fig. 4, and

Fig. 7 is a view showing the manner in which a sample of paper is taken.

Referring first to Figures 1, 2 and 3 of the drawing there is shown one form of cutting device by which a sample of paper may be taken. This device is provided with a supporting plate 11 upon which a handle 12 is mounted in any suitable fashion. The plate 11 is elongated and is provided with a series of holes 13 and two series of smaller holes 14 which are located opposite the holes 13. Two paper engaging members 16 or sliders are adapted to be fastened to this plate at a point along the plate 11 depending upon the width of the sample that it is desired to obtain. To this end each of the sliders 16, only one of which is shown, is provided with a pair of pins 15 that project upwardly from the top thereof and are received by the openings 14 in the plate 11. In this way the sliders are definitely located in the plate and they may be fastened in position by means of a screw or other fastening device 17 which extends through the opening 13 and into the slider. While only one of the sliders is shown they are duplicates in construction and either of them may be mounted on either end of the plate. Each of these sliders is formed with its lower surface smooth and the front and back ends rounded into the lower surface so that when it is pressed against a moving web of paper there will be no roughness or corners to injure the paper.

As is best seen in Fig. 1, the front end of each slider, or the left end in that figure is deeper than the rear end so that a cutting member 20 which is fastened to one side of each slider will extend therefrom to present a triangular shaped blade. The front part of this triangle merges into the leading edge of the slider and the rear end of the cutting blade extends from the slider so that a shearing effect will be obtained as the cutting device is placed against the web. The sliders 16 are cut as shown at 18 and receive a reinforcing portion 19 which is provided along the upper edge

of each of the cutting members. A plate 21, generally similar in shape to the slider 16, is pressed against the outer edge of the cutting member as shown in Fig. 2 and the plate and cutting member are fastened to the slider by a screw 22 or other suitable means. The construction insures that the entire cutting device will be held rigid and insures that there will be no relative movement between the various parts. By removing the screw 17 the sliders may be moved toward or away from each other in order that samples of different widths may be obtained. This is an advantage in some cases since with different types of paper different width samples are often desired in order to facilitate the testing thereof. In most cases, however, a standard width of sample of approximately two inches is satisfactory and to this end the sliders are generally fastened to the plate 11 in such fashion that the cutting members are approximately two inches apart.

In view of the fact that a standard width strip of paper for the sample is generally accepted there is disclosed in Figures 4 to 6 inclusive another type of cutting device in which the cutting members are not adjustable with respect to each other. This cutting device comprises a supporting plate 25 that is curved upwardly in the front at 26 and upwardly in the rear at 27 to provide a smooth paper engaging surface. A handle 28 is suitably attached to the front end 26.

The sides of the supporting plate are provided with projections 29 that are bent upwardly as best shown in Fig. 5. Each of these projections is so shaped that when a cutting member 20 is fastened thereon the front end of this member will merge into the front portion of the lower surface of this support as seen from the side. To this end the projections are generally triangular in shape when viewed in elevation. In this embodiment of the invention the reinforcing portion 19 of a cutting member 20 is laid along the top edge of the projection 29 and fastened to this position by means of a screw 31 that extends through a plate member 30 and a cutting member into the projection.

In Fig. 7 there is shown a plurality of rolls 32 that may form part of a paper dryer and over which a paper web 33 is passing in the direction of the arrow. When it is desired to take a sample of the paper, a cutting device which may take one of the forms above described is so held against the moving web that its front end is facing in the direction from which the web is coming and the cutting members are parallel with the web edge. The cutting members 20 therefore make two slits in the web as shown at 34 in Figure 7. The portion of the web joining these two slits is knocked out and the resulting strip of paper can be fed immediately to a waiting sample can. When enough paper has been obtained for the sample the cutting device is slowly moved toward the edge of the web as shown at 35 until the edge of the web has been reached. It must be remembered that the cutting device is held at the same position along the path of the web and is moved laterally thereof. The web moving past the cutting device will produce the sample strip.

As the sample is being taken a drying can is held below the cutting device so that the strip of paper may be fed directly into the can while it is being formed. In this manner the sample can immediately be sealed with a minimum of handling and before its moisture content can change appreciably. The cutting device may be placed at any point along the width of the web where it is desired to take the sample and when sufficient paper has been obtained the can can be closed. The remainder of the strip is discarded as the cutting device is moved to the edge of the web to finish out the strip. In taking a sample of paper in the manner above described the tension of the web is never removed and no tears or snags are made in the edge of the web that can start a break. The web on each side of the sample is passed on through the machine just as if nothing had happened to it. It is noted that paper samples large enough for test purposes may be obtained and enclosed in a drying can in from eight to twelve seconds, depending upon the speed of the machine, using the method and cutting device above described.

While in accordance with the provisions of the statutes, I have illustrated and described the best form of this invention now known to me, it would be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed without departing from the spirit of this invention as set forth in the appended claims, and that in some cases certain features of this invention may sometimes be used to advantage without a corresponding use of other features.

Having now described this invention, what I claim as new and desire to secure by Letters Patent is:

1. The method of obtaining a sample of a traveling web from any desired portion of its width which comprises the steps of simultaneously cutting a pair of parallel slits in the web in a direction opposite to the direction of web travel, maintaining said slits parallel to the edges of the web for a suitable time, slowly directing said slits toward an edge of the web until the edge is cut, and removing the strip of web from between said slits.

2. The method of obtaining a sample of a traveling web which consists in pressing a tool having a pair of parallel cutting edges on it against the web while the web is traveling to cut a strip therefrom, holding said tool so that the edges of the strip are parallel to the edges of said web until a strip of sufficient length is obtained and then moving said tool to an edge of the web to remove the strip from the web.

JOSEPH P. VOLLRATH.