May 3, 1949. J. SOBOTA 2,469,013

METHOD OF EVALUATING PAPER TOWELING OR THE LIKE

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Fig. 1.

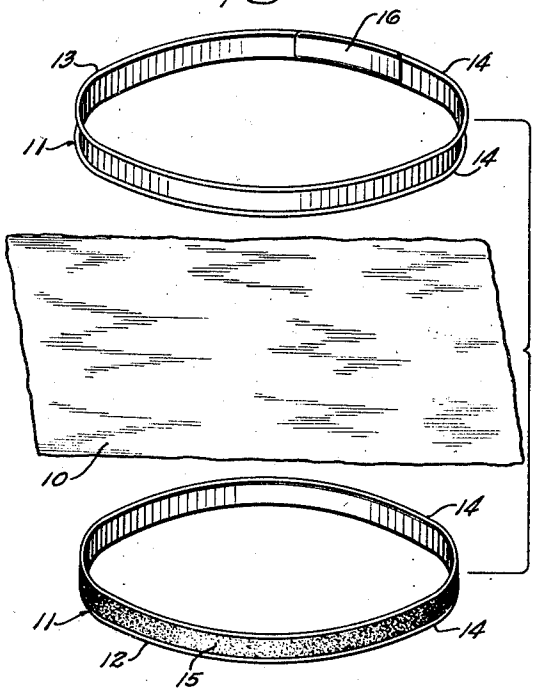


Fig. 2.

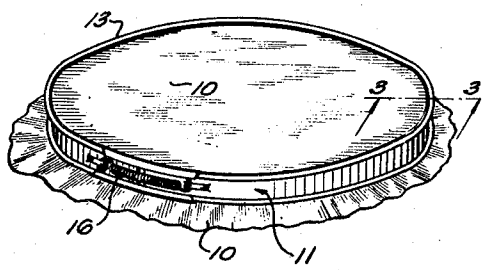
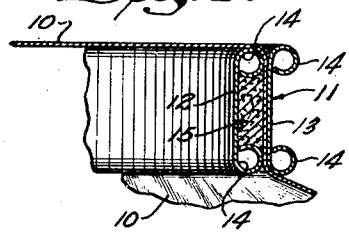


Fig. 3.



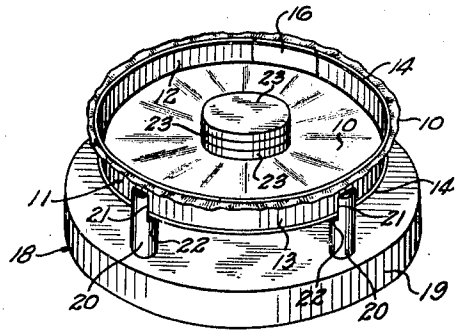
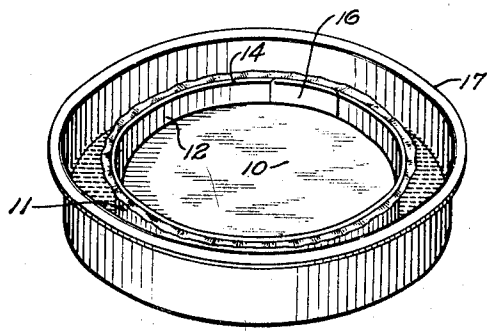


Fig. 5.

Fig. 4.



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METHOD OF EVALUATING PAPER TOWELING OR THE LIKE

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2 Claims. (Cl. 73—159)

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This invention relates to improvements in the method of evaluating paper toweling or the like.

There are three important characteristics which, when found together, identify high grade paper toweling. The first of these is the towel's ability to rapidly absorb liquids with which it comes in contact, and the second of these is the ability of the towel to absorb said liquids evenly throughout its extent. Generally, poor absorption qualities or the existence of areas of low absorption greatly decrease the efficiency of the towel and are a source of considerable inconvenience to the user.

The third characteristic of high grade toweling is its ability to resist being torn or broken after it has absorbed a quantity of water. This latter characteristic is what is known as "wet strength." High "wet strength" is very desirable for the reason that toweling which does not possess this characteristic is susceptible of being easily torn or of literally falling apart upon absorption of a quantity of water or other liquid. This not only makes the towel difficult to handle and use, but, in addition, results in portions of the towel being deposited on the skin of the user, which portions are difficult to remove. For these reasons it is evident that a towel of low wet strength is also a source of great inconvenience to the user.

As hereinbefore discussed it is of utmost importance that a paper towel, in order to give the highest degree of satisfaction to the user, possess high absorption speed, uniformity of absorption, and high wet strength. A towel lacking in any one of these characteristics is objectionable and is not considered to be of highest quality.

In order, therefore, to properly evaluate the quality of a given sample of paper toweling, it is necessary to test said sample for each of the three desired characteristics, and it is particularly desirable to be able to quickly and easily perform these tests at any convenient place, without the use of complicated laboratory equipment.

It is therefore a general object of the invention to provide an improved method of evaluating paper toweling or the like, which method includes tests for speed of absorption, for uniformity of absorption, and for wet strength.

A further object of the invention is to provide an improved method of evaluating paper toweling or the like which may be performed by a minimum of steps and without the use of complicated laboratory equipment.

A further object of the invention is to provide a method of evaluating paper toweling or the like which may be performed quickly and easily and in any convenient place.

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With these and other objects in view, the invention consists of the improved method of evaluating paper toweling or the like and all of the steps incident thereto, and all equivalents thereof.

A clear conception of the several steps of my improved method may be had by referring to the drawing accompanying and forming a part of this specification, wherein like reference characters designate the same parts in all of the views:

Fig. 1 is a perspective side view of a piece of paper toweling or the like, together with a pair of telescopic hoops showing the toweling about to be assembled therewith;

Fig. 2 is a side perspective view showing the section of toweling of Fig. 1 framed by the telescoping hoops of Fig. 1, the latter being in assembled relationship;

Fig. 3 is an enlarged, fragmentary vertical sectional view taken along the line 3—3 of Fig. 2;

Fig. 4 is a perspective view of the assembly of Fig. 2 inverted and placed in a pan, the bottom of the latter being covered with water; and

Fig. 5 is a perspective view of the assembly of Fig. 2 removed from the pan of Fig. 4, the assembly being placed on a supporting stand, and there being test weights on the toweling.

Referring more particularly to Fig. 1 of the drawing, the numeral 10 indicates a sheet of paper toweling or the like, the characteristics of which are to be evaluated. The first step of the improved evaluation method is to mount the sheet 10 in a suitable frame, such as the frame 11. The latter comprises a pair of telescopic hoops 12 and 13. The hoops 12 and 13 are preferably formed with outwardly projecting heads 14 at their upper and lower edges (see Fig. 3), the inner hoop 12 being preferably provided on its outer face with a layer of cork or similar material 15 between the beads 14. In addition, the outer hoop 13 may be provided with a spring loaded expansion joint 16. To mount the sheet 10 it is laid over the hoop 12, and the hoop 13 is placed on top of the sheet 10 in registration with the hoop 12. Downward pressure on the hoop 13 causes it to telescope down over the hoop 12 with the towel 10 interposed therebetween. In drawing the hoop 13 over the hoop 12, the towel 10 is pulled until the drumhead portion thereof within the frame 11 is relatively taut. The spring of the expansion joint 16 causes the hoop 13 to tightly encircle the hoop 12 and the portion of the towel 10 drawn thereover. The outwardly extending edges of the paper

are then trimmed off adjacent the frame 11 as shown in Figs. 4 and 5.

To perform the first test in the evaluation of the sample of toweling 10, a small amount of water sufficient to cover the bottom is placed in a suitable pan 17 having a diameter larger than that of the frame 11. The frame 11 carrying the paper 10 is then brought, paper side down, over the water in the pan 17. The frame 11 and towel 10 are then lowered toward the surface of the water in the pan 17 and are brought in contact therewith (as shown in Fig. 4) in such a manner that at the instant of said contact the plane of the paper 10 is substantially parallel with the plane of the surface of the water in the pan 17. From the instant of contact of the towel 10 with the water in the pan 17 the towel 10 will begin to absorb the water due to capillary action. The speed with which the sample of towel 10 absorbs the water can be readily observed and compared with the speed of absorption of other samples under like conditions. Generally speaking, the higher the speed of absorption, the better the quality of the towel. Simultaneously, with the observation of the speed of absorption of the sample, observation can be made of the uniformity with which the sample absorbs over its entire water-contacted area. Non-uniformity of absorption usually indicates that the sample of toweling is not homogeneous in substance and, hence, is not of high quality.

After the sample of toweling 10 has been wet, the frame 11, along with the towel 10, is removed from the pan and placed on a suitable support such as the stand 18. The stand 18 may consist of a round base member 19 provided with upright leg members 20 projecting therefrom and positioned adjacent the periphery of the base 19. The legs 20 are preferably formed with notched out portions 21 on the inner side of their upper ends, which notches provide shoulders 22 spaced downwardly from the upper ends of the legs 20 and on which the frame 11 may be supported.

The wet strength of the sample 10 can now be tested by placing on the center thereof, as shown in Fig. 5, a sufficient number of weight discs 23 to cause a breaking of the discs through the towel 10. Initially, only one weight disc 23 is placed on the wet towel 10, and then additional single weight discs 23 are placed on top of the first weight disc until the breaking point is reached. The number of discs 23, each of predetermined weight, which are necessary to cause a breaking of the towel 10, is a measure of the wet strength of the towel. This number may be readily compared with the number of discs 23 necessary to cause the breaking of a sample of other toweling under the same conditions. The greater the amount of weight as above determined, which can be sustained by a sample of wet toweling 10, the greater its wet strength.

A round frame 11 used in conjunction with weights having a round contacting surface area has been found to give the most accurate results. This is because of the fact that the round shape of the weights coacting with the round shape of the frame causes the sample of toweling being tested to be stressed uniformly. As a result, said sample will sustain a maximum amount of weight before fracture, since there are no points of abnormal stress which might cause premature fracture and erroneous results.

From the foregoing it will be observed that the invention provides a quick, easy and novel method of evaluating a sample of paper toweling by testing the quality of its three basic characteristics. No elaborate laboratory equipment is necessary, the equipment used being simple and portable, and permitting the performance of the evaluating tests at any convenient place.

Various changes and modifications may be made without departing from the spirit of the invention, and all of such changes are contemplated as will come within the scope of the claims.

What I claim is:

1. The method of evaluating paper toweling or the like including the steps of supporting a circular extent of the toweling on a frame by engaging the peripheral portions thereof with said frame in such a manner that the portion of the towel within the engaged peripheral portions thereof is relatively taut and lies in substantially one plane only, then wetting said last mentioned portion of toweling, then supporting the frame in a horizontal plane, and then applying to the toweling at substantially the center thereof a progressively increasing number of weights of substantially the same shape as the portion of the toweling within the frame until the breaking point of the toweling is reached.

2. The method of evaluating paper toweling or the like including the steps of supporting a circular sheet of toweling on a frame by engaging the entire peripheral area of the toweling with said frame in such a manner that the portion of the toweling within said engaged periphery thereof lies in substantially one plane only, then bringing said portion of the toweling within the frame into contact with the surface of a body of water in such a manner that at the instant of said contact the portion of the towel within the frame and the surface of the water are substantially parallel, then supporting said frame and towel in a horizontal plane, and then applying a progressively increasing predetermined weight on a predetermined area of the central portion of said toweling until the breaking point of the toweling is reached.

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