H. S. WILSON.

PAPER RECEPTACLE.

APPLICATION FILED NOV. 11, 1910.

1,100,809. Patented June 23, 1914.

Fig. 1.

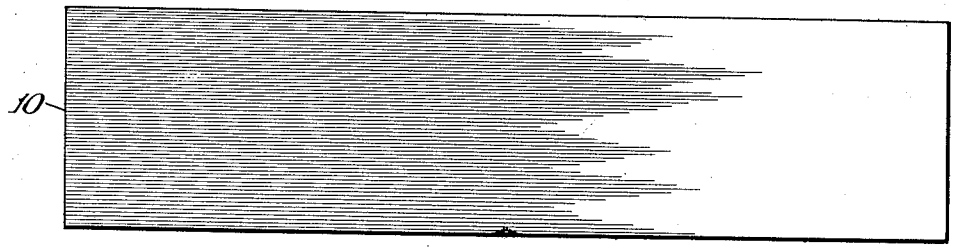


Fig. 2.

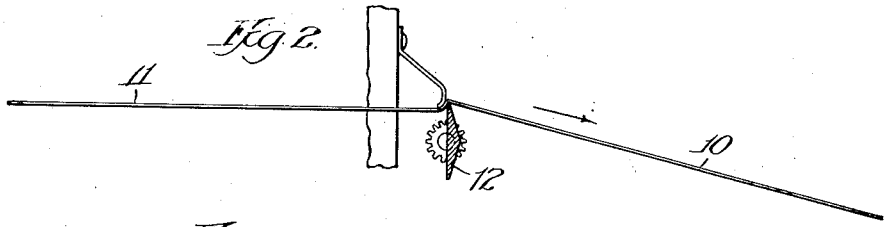


Fig. 3.

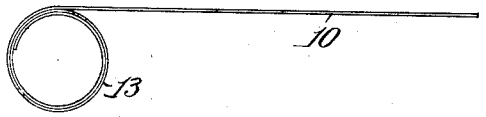


Fig. 4.

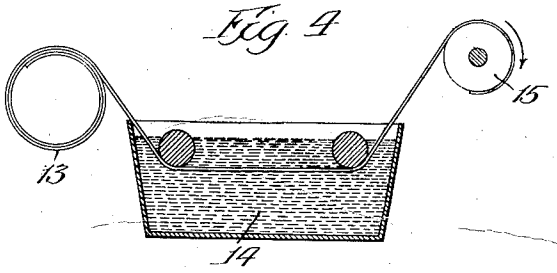
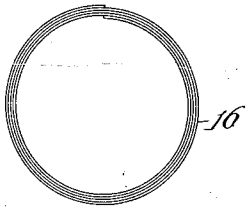


Fig. 5.



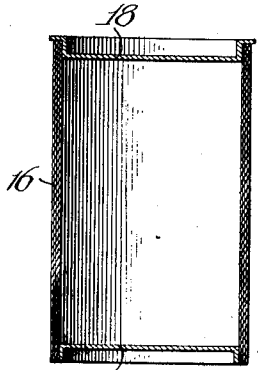


Fig. 6.

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UNITED STATES PATENT OFFICE.

HERBERT S. WILSON, OF ST. LOUIS, MISSOURI.

PAPER RECEPTACLE.

1,100,809. Specification of Letters Patent. Patented June 23, 1914.

Original application filed March 14, 1910, Serial No. 549,199. Divided and this application filed November 11, 1910. Serial No. 591,909.

To all whom it may concern:

Be it known that I, HERBERT S. WILSON, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Paper Receptacles, of which the following is a specification.

My invention pertains to paper and pasteboard containers, receptacles, boxes, cartons, tubes and the like, its leading and principal aims and objects being the provision of a receptacle or holder which is well adapted to perform its function of holding and preserving its contents in proper or suitable condition. Preferably, but not necessarily, the receptacle or tubular holder is made either water or moisture proof or impervious to its intended contents.

More particularly or especially the invention relates to tubular or cylindrical containers, the tube portion of which is made of a strip of paper or other fibrous material wound upon itself in a series of convolutions to provide the desired thickness. Such strip of paper is coated with paraffin or other suitable material, depending upon the use to which the receptacle is to be put, and if paraffin or other water or moisture proof material is employed, the resulting tube itself will be moisture proof.

One of the peculiarities of the tube portion of my novel receptacle resides in the tendency of the inner convolutions of the strip of paper to expand or enlarge and the tendency of the outer convolutions to contract or diminish in diameter, such bias or inclination being brought about by curling or giving a permanent curled set to a portion only of the paper strip preliminary to forming the strip into tubular or cylindrical shape, with the uncurled end or portion innermost. Such uncurled end, after being wound up, tends to straighten out and expand, while the convolutions composed of the curled portion, which may be initially curled or set at a smaller diameter than that of the finished tube, act to tightly hug one another and the inner convolutions,—in other words, tend to contract. The tubular portion of receptacles of this kind may be made with or without an adhesive or other coating in those instances where it is not necessary to make them water or moisture proof or impervious to the action of the intended contents of the container. Ordinarily, however, the paper strip would be passed through a bath of melted paraffin after being curled and before being rolled or wound into cylindrical form. The paraffin does not remove or decrease the tendency of the paper to curl or wind up upon itself, because none of the constituents of the paper are soluble in the melted paraffin. Such paraffin when melted has substantially no adhesive qualities; consequently the value of holding the convolutions of the tube in contact or against one another during the cooling or setting of the paraffin will be quite obvious, the paraffin in its hardened condition acting not only to water-proof the tube throughout its thickness, but also acting as an adhesive to bind or secure together the various convolutions, as a strengthening or stiffening medium for the paper or other fibrous material, and as means to increase the translucency of the paper.

In order that a full understanding of the structure and peculiarities of my improved holder or receptacle may be understood, I have illustrated in the accompanying drawing-forming a part of this specification the various steps in the manufacture of the same.

In the drawing,—Figure 1 is a face view of a blank sheet of paper adapted to be formed into a tube, the latter to be used by itself or in conjunction with one or more inclosures; Fig. 2 illustrates the step of drawing a portion of the paper strip over a knife edge to curl or set the same; Fig. 3 shows the paper strip after a part of the same has been drawn over the knife edge; Fig. 4 illustrates the manner of winding the paper strip on a mandrel with the uncurled end innermost, the paper passing through a bath of adhesive or protective coating; Fig. 5 illustrates in section the finished tube; and Fig. 6 shows, in longitudinal section, such a tube in conjunction with two end caps to form a receptacle or container.

In the drawing the manner of making the tube has been shown somewhat conventionally, but yet fully enough so that one skilled in this art may readily understand the same.

The paper blank 10 from which the tube is to be made is manipulated so as to draw

a portion 11 of the same at an angle over a knife edge 12 so as to curl or permanently set such end portion of the strip, as shown at 13 in Fig. 3. The paper is then passed through a bath of melted paraffin 14, and is wound on a mandrel or form 15 with the uncurled end innermost; a section of the finished tube being shown in Fig. 5, while Fig. 6 illustrates, in longitudinal section, such a tube 16 provided with a bottom end closure 17 held in the end of the tube by paraffin, the upper end of the receptacle being supplied with a removable flanged cap or closure 18.

The drawing of a part of the paper strip across the knife edge 12 curls a portion of the paper as shown in Fig. 3, the diameter of the curl being preferably somewhat less than the diameter of the finished tube. The passage of the previously curled paper through the paraffin bath does not remove the tendency to curl, owing to the fact that none of the constituents or ingredients of the paper are soluble in paraffin. By winding this coated strip on the mandrel into cylindrical form, the inner convolutions, composed of the formed straight portion of the strip, have a tendency to expand or unwind, while the outer, previously-curled convolutions have a tendency to contract, the resulting action being that all of the convolutions are held closely in contact with one another during the setting or hardening of the paraffin, which acts not only to water-proof the tube throughout its thickness, but also to cement or bind the convolutions together, to stiffen the shell and make it more nearly transparent. Subsequently, if it is desired to have a closed retainer or receptacle, the end caps 17 and 18 are applied to the tube, one or both being held in place by a paraffin coating. In some instances it may be desirable to make these tubes without an adhesive or protective coating, and under such circumstances the partially curled strip of paper would be wound on the mandrel with the uncurled end innermost, without coating the strip, the finished tube retaining its proper form and shape owing to the tendency of the inner convolutions or windings to enlarge and the outer convolutions to contract.

Although I have described the use of paraffin as a suitable material, which has not only the water or moisture proofing qualities when semi-solid or completely hardened, but also the adhesive qualities, it is to be understood that the invention is in no way limited or restricted to the use of this particular material.

This application is a division of my former application, Serial No. 549,199, filed March 14, 1910, upon which Patent No. 1,015,370 was issued to me January 23, 1912.

I claim:

1. As an article of manufacture, a tubular member made of a strip of paper wound upon itself in a series of convolutions of the completed article, the inner convolutions having a tendency to straighten, the outer convolutions having a tendency to curl, substantially as described.

2. As an article of manufacture, a tubular member made of a strip of paper wound upon itself in a series of convolutions, the inner convolutions having a tendency to expand, the outer convolutions having a tendency to contract, said strip of paper being coated on both sides with paraffin which water-proofs the same and acts as an adhesive to bind the convolutions together, substantially as described.

3. As an article of manufacture, a tubular body composed of continuous laminæ of which different portions possess a permanent set exerting oppositely acting stresses whereby the laminæ tend to hug one another, substantially as described.

4. As an article of manufacture, a tubular body composed of continuous laminæ of which different portions possess a permanent set exerting oppositely acting stresses whereby the laminæ tend to hug one another, and water-proof adhesive material between the laminæ of said body, substantially as described.

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