C. H. HOWARD.

PAPER TUBE AND CONTAINER.

APPLICATION FILED AUG. 12, 1919.

1,383,809. Patented July 5, 1921.

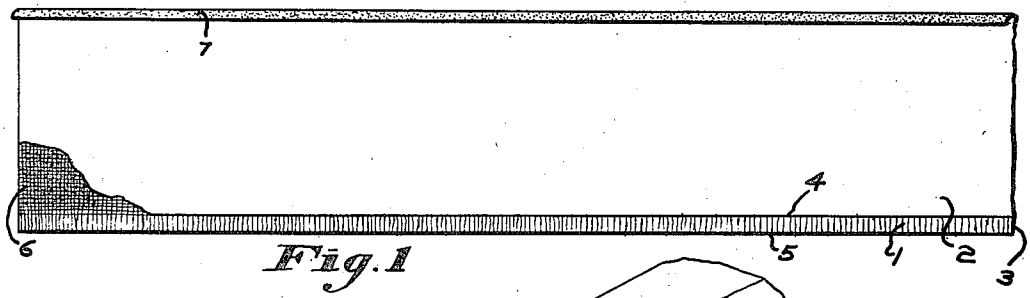
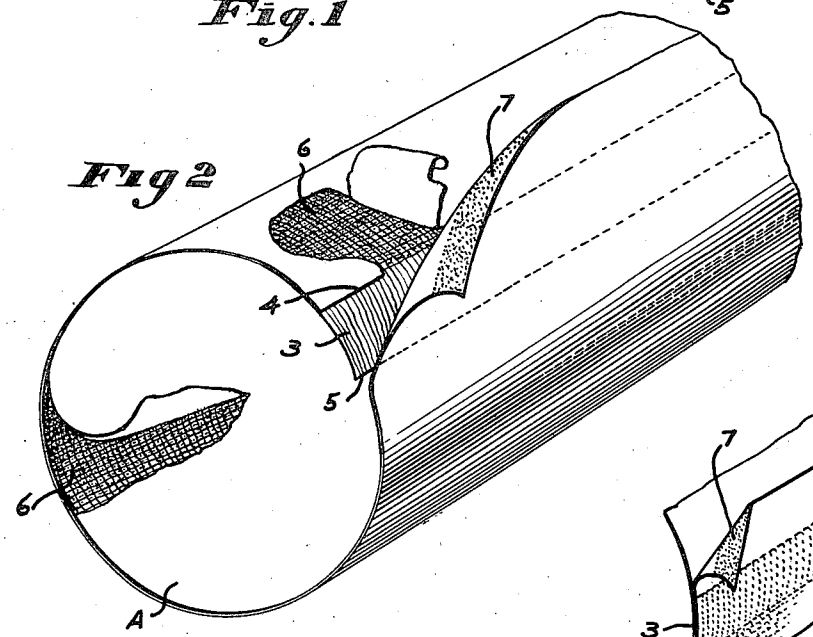


Fig. 1

Fig 2



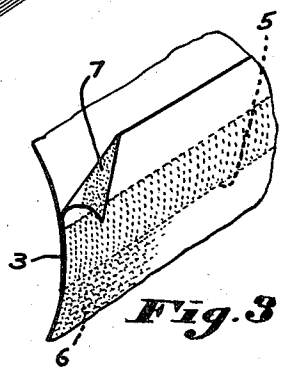


Fig. 3

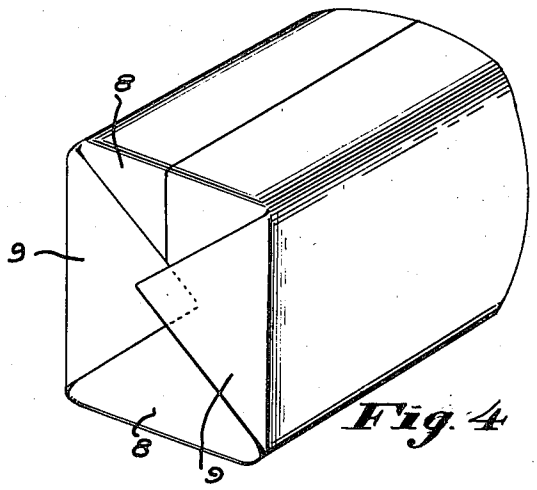


Fig. 4

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UNITED STATES PATENT OFFICE.

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PAPER TUBE AND CONTAINER.

1,383,809. Specification of Letters Patent. Patented July 5, 1921.

Application filed August 12, 1919. Serial No. 316,964.

To all whom it may concern:

Be it known that I, CHARLES H. HOWARD, a citizen of the United States, residing at Saugus, in the county of Essex and State of Massachusetts, have invented an Improvement in Paper Tubes and Containers, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to paper tubes or containers, and more particularly to such tubes or containers that are waterproof.

In making waterproof tubes or containers, it has been heretofore suggested to employ a waterproof adhesive for uniting two superposed pieces of fabric or paper, and then to secure the edges of the paper together to complete the container or tube.

Difficulty is experienced, however, in making waterproof tubes and containers, by the incorporation therewith of a waterproof adhesive, because, while the waterproof adhesive, such as asphaltum or other like compound may have sufficient adhesive qualities to maintain the parts in proper relation under normal conditions, it happens at times, especially where the container is subjected to unusual strain in the presence of moisture, that the container may rupture along the line of the seam. On the other hand, non-waterproof adhesive, such as gums and the like, have the requisite strength to secure the seams together, but lack the waterproof quality which is desirable.

To impart the desired strength to the tube or container to resist rupture in ordinary use, it is desirable that the superposed layers of paper of which the container is preferably formed, may have associated therewith, threads, fibers and the like.

An important feature of the present invention, therefore, consists of a paper tube, which may itself form a container, or from which containers, such as bags, may be made, formed from a blank comprising the superposed layers of paper of unequal size to produce a marginal portion of single ply, the two superposed paper plies being adhesively secured together by a waterproof material, such as asphaltum or the like, and the marginal single ply being provided with a non-waterproof adhesive.

Where the body strength of the container is of importance, it is desirable to have the two paper plies reinforced by reinforcing filaments, as hereinbefore noted, and the present invention in this aspect provides for the incorporation with the waterproof adhesive which connects the two plies together, of a series of reinforcing filaments embedded in the waterproof material. These reinforcing filaments may extend transversely of the blank and also longitudinally thereof if desired, and where they extend transversely, the present invention contemplates that the uncovered portions of the reinforcing filaments which extend along the marginal flap, shall be adhesively secured between the single ply marginal flap and the body or two ply portion of the blank by a non-waterproof material, and to prevent moisture seeking its way into the non-waterproof adhesive, a marginal waterproof adhesive is preferably employed along the overlapping edge of the two ply or body portion of the blank. By having the non-waterproof adhesive applied to the single ply or between it and the double ply when the parts are connected together, the moisture which evaporates from the non-waterproof adhesive, may pass through the single ply without obstruction by any overlying waterproofing material.

The blank from which the tube is made, may be formed of two longitudinally extending strips of paper of unequal width, adhesively connected together by a waterproof adhesive with one edge of each of the superposed strips of paper coinciding, and the other edges, due to the difference in width of the two plies, being separated a distance to provide a marginal edge of single ply.

In the drawings:

Figure 1 represents a blank from which the tube may be formed;

Fig. 2 represents a tube formed of the blank and having parts broken away to disclose the construction beyond;

Fig. 3 is a detail perspective showing more clearly the underlapping single ply having the non-waterproof connection with the overlying double ply, and the waterproof adhesive applied to the edge of the double ply to protect the non-waterproof material; and

Fig. 4 represents a container in the form of a bag which may be produced by cutting the tube in sections and turning in one end, or both.

The blank is composed of a layer 1 of paper on which is superposed another layer 2 which is narrower than the underlying layer, the two being adhesively connected together by a waterproof material which extends throughout the contact surfaces of the two paper strips or layers. Owing to the difference in width of the layers 1 and 2, there is produced along one longitudinal edge portion of the blank, a single ply of paper as at 3, its width being defined by the distance between the edge 4 of the narrow strip and the edge 5 of the wider strip.

The waterproof adhesive or asphaltum is omitted along the marginal single ply 3, and instead of such waterproof adhesive, this marginal single ply strip is provided with a non-waterproof adhesive or gum which has the desired adhesive tendency superior to that of the waterproof material under certain conditions.

It is desirable to have the paper tube of sufficient body strength to withstand the internal strains to which it is subjected, and to this end the present invention contemplates the reinforcement of the blank and of the completed tube by means of reinforcing filaments 6 which, as indicated in Fig. 2, may extend longitudinally and circumferentially of the tube when the blank is rolled into its tubular form. This disposition of the reinforcing filaments 6 is represented at the broken away portion of the blank in Fig. 1.

The portion of the transversely extending filaments that project beyond the edge 4 of the narrower strip, may not have the longitudinal reinforcing filaments associated therewith, and will be secured to the single ply marginal portion 3 by the non-waterproof material applied thereto for connecting it to the two ply waterproof portion of the body when the blank is finally rolled into tubular form as indicated in Fig. 2.

In order to form the tube from the blank indicated in Fig. 1, the blank is rolled about its longitudinal dimension into tubular form as indicated in Fig. 2, wherein it will be noted that the single ply marginal portion 3 underlies the double ply or body portion of the blank, and as hereinbefore noted, the single ply marginal portion 3 will be connected to the overlying two ply portion of the blank by a non-waterproof adhesive, which not only connects the single ply to the body or double ply, but confines the filaments which are exposed along the single ply between the single ply and the double ply. This condition of the final structure is indicated in Fig. 3.

When the single ply 3 has been united to the overlying or double portion, a waterproofing material 7 is applied along the edge of the overlapping portion of the body where it extends beyond the edge 4 of the narrower strip of paper, to thereby protect the non-waterproof material from the entrance of moisture along the edge of the overlapping double ply.

When it is desired to make a bag form of container as indicated in Fig. 4, the tube A (Fig. 2) may be cut up into desired lengths, and then the ends infolded as at 8 and overlapped by the infolded side portions 9, a suitable waterproof adhesive being employed on the flaps 8 and 9 to permanently secure them together.

What is claimed is:—

1. A paper tube formed from a blank which is composed of two superposed layers of paper secured together by a layer of waterproof adhesive, one of the layers of paper having a marginal portion longitudinally of the blank which is free from waterproof material and which extends beyond the edge of the superposed layer of paper, a non-waterproof adhesive for securing said marginal single ply portion to the inner wall of the double ply portion of the blank to form the blank into a tube, and a waterproof adhesive securing the longitudinal marginal portions of the double ply blank to each other in overlapping engagement and in position to exclude atmosphere moisture from said non-waterproof adhesive.

2. A paper tube formed from a blank which is composed of two superposed layers of paper secured together by a layer of waterproof adhesive, one of the layers of paper having a marginal portion longitudinally of the blank which is free from waterproof material and which extends beyond the edge of the superposed layer of paper, a non-waterproof adhesive for securing said marginal single ply portion to the inner wall of the double ply portion of the blank to form the blank into a tube, a series of reinforcing filaments extending transversely of the blank and embedded in the waterproof adhesive with portions of the filaments secured to said marginal portion by the non-waterproof adhesive, and a waterproof adhesive securing the longitudinal marginal portions of the double ply blank to each other in overlapping engagement and in position to exclude atmosphere moisture from said non-waterproof adhesive.

In testimony whereof I have signed my name to this specification.

CHARLES H. HOWARD.