H. DRYSDALE.

PAPER CONTAINER.

APPLICATION FILED NOV. 20, 1918.

1,397,756. Patented Nov. 22, 1921.

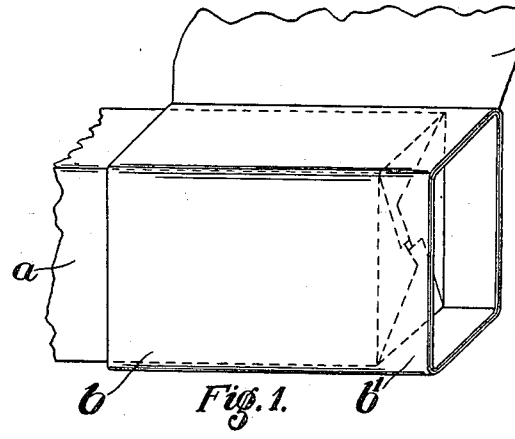


Fig. 1.

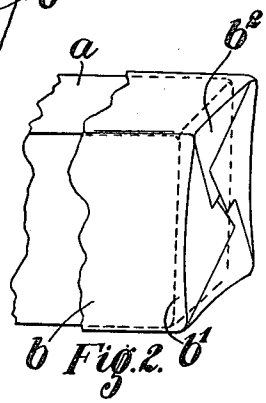


Fig. 2.

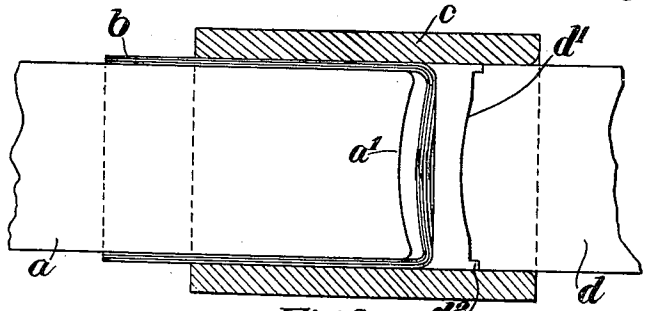


Fig. 4.

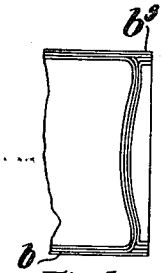


Fig. 5.

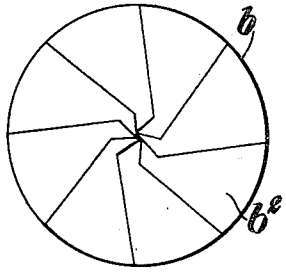


Fig. 3.

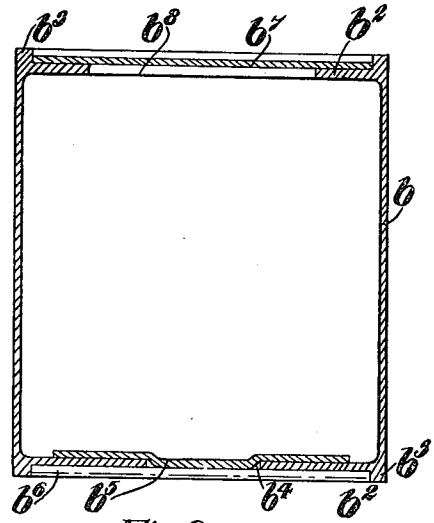


Fig. 6.

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PAPER CONTAINER.

1,397,756. Specification of Letters Patent. Patented Nov. 22, 1921.

Application filed November 20, 1918. Serial No. 263,330.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that I, HENRY DRYSDALE, a subject of the King of Great Britain, residing at London, England, have invented certain new and useful Improvements in Paper Containers, (for which I have filed application in Great Britain, October 2, 1897, Patent No. 120,408,) of which the following is a specification.

The invention relates to improvements in or connected with the manufacture of paper containers.

The primary object of the invention is to produce, in paper, containers designed to take the place of metallic boxes such as are employed to contain coffee or the like.

For this purpose a mandrel is employed of the shape in cross section that is required to be given to the container and may, for example, be approximately rectangular with rounded corners, or cylindrical.

Upon this mandrel is wound a continuous strip or sheet of paper of the required width to form the body of the box, but so as to overlap or extend beyond the mandrel at one or both ends, where it is turned down in plaits and consolidated to form the bottom or part of the top of the box.

In order that the said invention may be more clearly understood and readily carried into effect, I will proceed, aided by the accompanying drawings, more fully to describe the same.

Figure 1 is a perspective view illustrating an approximately rectangular container in course of formation by winding a sheet of paper upon a mandrel according to the present invention;

Fig. 2 is a similar view illustrating the device when the winding is completed and the bottom is folded into plaits;

Fig. 3 is a diagrammatic end view representing the arrangement of the plaiting in a cylindrical container;

Fig. 4 is a sectional view illustrating the partly finished container still upon the mandrel placed in a former, and a die or plunger about to advance to complete the bottom;

Fig. 5 is a sectional view of part of the container showing the bottom in its finished form; and

Fig. 6 is a sectional view of a large sized container closed in at both ends.

In the several figures like parts are indicated by similar letters of reference.

Referring to Figs. 1 to 5, *a* represents the mandrel, *b* represents the container, b^+ represents the sheet of paper of which it is formed, *c* represents the form, and *d* represents the die or plunger.

The mandrel *a* is necessarily of the shape in cross section that is required to be given to the container *b*, and may be, for example, approximately rectangular with rounded corners, or hexagonal, or of other angular figure, or cylindrical, and this mandrel is mounted in any suitable machine and receives the required rotary motion.

Upon the mandrel *a* is wound a continuous strip or sheet of paper b^+ of the required width to form the body of the container *b*, but of such a width as to overlap or extend beyond the mandrel *a* at one or both ends, according to whether the container *b* is to be closed at one end, as shown at Figs. 1 to 5, or at both ends, as shown at Fig. 6, as hereinafter described.

The paper strip or sheet b^+ is coated with cement on one side, that is to say, the inside or the side nearest the mandrel *a*, but a short length of it, to form the first convolutions of the container *b*, is left uncoated in order to prevent the cement coming into contact with the mandrel *a*.

That part of the paper strip or sheet b^+ which forms the bottom or top, as the case may be, of the container *b*, that is to say, the part b^1 which overlaps the mandrel *a*, is for the first convolution coated on the outside with cement, and for the remainder of the convolutions said overlapping part b^1 is coated on the inside with cement. If desired, the entire end of the sheet for the first convolution may be coated on the outside; all the overlapping part may be coated on the outside instead of the inside if desired, or in addition to the inside coating, depending upon the apparatus employed.

The mandrel *a* is rotated, and the paper strip or sheet b^+ is wound thereon, while a suitable degree of tension is applied thereto in any well known manner.

During the winding the overlapping end b^1 of the container in course of formation is by hand or by any suitable mechanism, as the winding progresses, folded into triangular plaits b^2 which overlap one another and form the bottom of the container, but the paper is preferably scored in the lines of the folds while in the blank.

At Fig. 2 the triangular plaits are shown to be folded over one another progressively from the sides of the device, while at Fig. 3 said triangular plaits b^2 are shown to be folded over one another similarly in progressive order, that is to say, each one overlaps that immediately preceding it. When the required number of convolutions or thickness of paper has been wound upon the mandrel a said mandrel is slightly withdrawn or retracted relatively to the container b and the bottom of the container is pressed roughly into shape by hand or otherwise, and the container while still on the mandrel a is placed in a form c and the bottom is pressed in a slight distance by means of a die or plunger d.

The mandrel a is preferably formed at its end with a cup or cavity a^1, and the die or plunger d is formed with a co-acting convexity d^1 and also with a continuous or annular notch d^2.

The pressure of the die or plunger d has the effect of consolidating the bottom of the container b (the cupped formation giving added strength) and forming a continuous or annular strengthening rim or flange b^3 around the bottom.

At Fig. 6 is represented a container b which is assumed to be of large size and is formed with a top as well as a bottom constructed by plaiting and pressing in the manner hereinbefore described.

In this case the overlapping part b^1 of the strip or sheet of paper b^+ plaited in the above manner may be insufficient by reason of the width of the paper used to completely close the bottom or top, thus leaving a hole b^4 which is closed by means of a disk b^5 of paper, wood, or the like which is introduced into the inside of the container b beyond the end of the mandrel at the commencement of the winding.

In order to stiffen the device a disk or plate b^6 of wood or other suitable material, shown by dot and dash lines, may be placed on the bottom within the rim or flange b^3 and held in place by cement or otherwise; a similar plate may be used either outside or inside the base of a container as in Fig. 4 before pressing.

The top end of this large size container is formed in the winding with a part b^1 overlapping the mandrel a similarly to the bottom, and is closed in by plaits b^2 in the same way, except that a larger hole or opening b^8 is left which forms the mouth of the container b, and this is closed by a loose lid b^7 of any suitable material seating on the top within the continuous annular rim or flange b^3, or the lid b^7 might be hinged.

The ends of the device, after plaiting are pressed by means of dies or plungers, as hereinbefore described, the mandrel affording the necessary resistance.

The mandrel employed in the construction of containers closed in at both ends in the manner lastly hereinbefore described is necessarily of a collapsible character, and may be of any known construction having a reduced part or stem for mounting it in the machine and thus affording space for folding in and plaiting the overlapping part b^1 of the strip or sheet of paper b^+, and this mandrel, after the container b is finished, is removed through the larger hole or opening b^8 at the top of the device.

For some purposes the container b may be lined with parchment paper or the like (not shown) which is wound the required number of convolutions upon the mandrel prior to winding the body of the container, and cemented and folded in a similar way.

The finished containers may, when required, be water-proofed by any known method.

Having thus described the nature and objects of my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A method of constructing a paper container by winding around a mandrel a strip or sheet of paper in layers coated with adhesive on one side, that is, the inside, with the exception of a short space at the end forming the first layer, and so that there is an overlap of paper beyond the mandrel; progressively plaiting during the winding the overlapping part into overlapping plaits to form the end of the device, and compressing the said plaited part between the two surfaces for the purpose of consolidating same.

2. The method of constructing a paper container by winding around a mandrel a strip or sheet of paper in layers so that there is an overlap of paper beyond the mandrel, coating the said strip with adhesive on the inside with the exception of a short length at the end forming the first layer, and which together with the first layer of the overlapping part is coated on the outside, progressively plaiting during the winding the overlapping part into overlapping plaits to form the end of the container, and pressing in the said plaited part by means of a plunger co-operating with the end of the said mandrel.

3. The method of constructing a paper container by winding around a mandrel a strip or sheet of paper in layers so that there is an overlap of paper beyond the mandrel, coating the said strip with adhesive on the inside with the exception of a short length at the end forming the first layer, and which together with the first layer of the overlapping part is coated on the outside, progressively plaiting during the winding the overlapping part into overlapping plaits to form the end of the container, and pressing in the said plaited part by means of a plunger having a convex end with a notch

all round it coöperating with a concave end on the said mandrel.

4. The method of constructing a paper container by winding around a mandrel a strip or sheet of paper in layers so that there is an overlap of paper beyond the mandrel, coating the said strip with adhesive on the inside with the exception of a short length at the end forming the first layer, and which together with the first layer of the overlapping part is coated on the outside, progressively plaiting during the winding the overlapping part into overlapping plaits to form parts of the ends of the container, pressing in the said plaited part by means of a plunger coöperating with a mandrel, completing the closure of the bottom end by means of a disk or plate cemented in place, and completing the closure of the top end by means of a lid.

5. The method of constructing a paper container wherein a strip or sheet of paper is concurrently plaited and overlapped at the end during the winding on of the strip or sheet.

In testimony whereof I affix my signature.

HENRY DRYSDALE.