

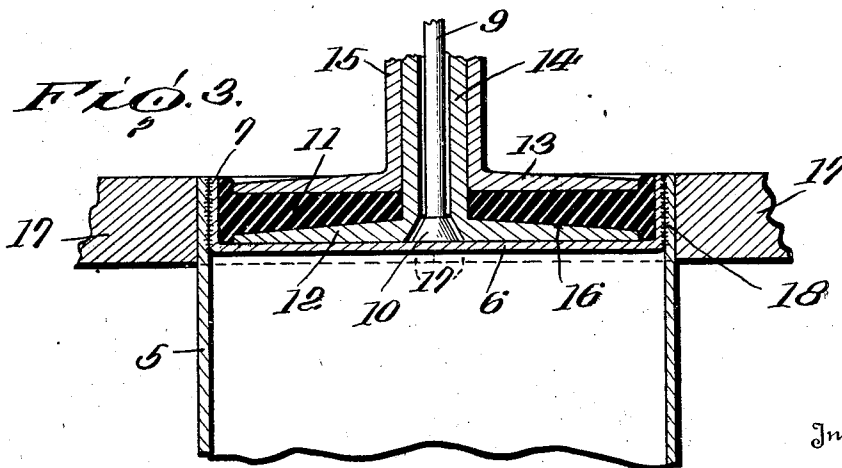
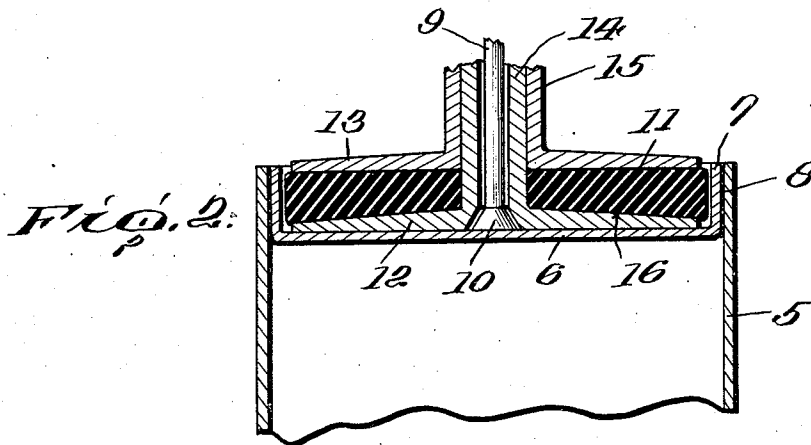
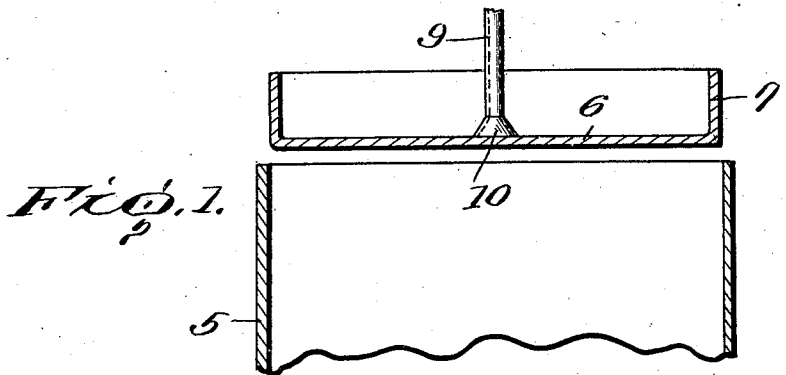
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APPARATUS FOR FORMING END CLOSURES IN PAPER CONTAINERS

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APPARATUS FOR FORMING END CLOSURES
IN PAPER CONTAINERSJohn Coyle, Baltimore, Md., assignor to Conti-
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1 Claim. (Cl. 93—55.1)

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The invention relates generally to the art of manufacturing paper containers and seeks to provide a novel apparatus for forming end closures in such containers.

When container structures are formed entirely of paper, the end closures are, of course, secured in place by an adhesive union with the body stock. In effecting these unions, the use of instantaneously setting adhesives has not proven entirely satisfactory. In the employment of vegetable, animal or mineral glues, the best results have been obtained when the surfaces to be adhered have been held together for an interval of time, say twenty or more seconds. The present invention resides in providing a novel apparatus for holding paper container body and end closure surfaces together in a manner for assuring the provision of a perfect union therebetween.

Another object of the invention is to provide an improved apparatus which includes an expansible circular element insertible in the cup shaped end closure inserted in an end of a container body, and means for bringing about expansion of said element to tightly press and hold the annular wall or skirt of the closure against the opposing wall portions of the body.

Another object of the invention is to provide an apparatus of the character stated in which the expansible element comprises a rubber disk or ring, and in which there are included two presser plates opposing the ring at the upper and lower sides thereof and which are movable together to deform the rubber disk between them and cause it to expand uniformly outwardly in all directions, or apart to permit the rubber disk to relax and assume its normal condition in which it is readily insertible into the annular wall or skirt of the end closure.

Another object of the invention is to provide an apparatus of the character stated in which the plates are carried on tube structures telescopically arranged, one within the other, and in which one plate has the face thereof which opposes the cooperating plate flared so as to form with the opposing plate a rubber disk receiving space which is wedge shaped in radial cross section thereby to facilitate the desired outward deformation of the disk when the plates are pressed together.

Another object of the invention is to provide in an apparatus of the character described a suction tube extending through the plate carrying tubes into position for engaging and supporting an end closure with its annular wall or skirt surrounding the deformable rubber disk.

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With the above and other objects in view that will hereinafter appear, the nature of the invention will be more fully understood by following the detailed description, the appended claim and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a fragmentary sectional view illustrating the open end of a paper container body and a paper end closure about to be inserted therein.

Figure 2 is a view similar to Figure 1 illustrating the end closure inserted in the container body and the end closure pressing or securing apparatus inserted in the end closure prior to expansion thereof.

Figure 3 is a view similar to Figure 2 and illustrates the expanded condition of the apparatus.

In the example of embodiment of the invention herein disclosed 5 designates a paper container body which may be formed by either convolutely or spirally winding the web stock in the manner well known in the art. A cup shaped end closure 6, also formed of paper, is provided for insertion in an open end of the container body for effecting closure thereof, and the end member may be die-shaped so as to provide the annular wall or skirt 7. The end closure 6 is inserted in the open end of the container body in the manner illustrated in Figure 2 with an adhesive 8 interposed between the outer face of the end closure skirt 7 and the inner face of the container body 5. The adhesive may be of any suitable type and may be applied to the external face of the skirt 7, to the internal face of the container body 5, or to both of the opposing faces of these elements.

A suction tube 9 having a suction cup 10 at the end thereof may be employed to facilitate the handling of the end closure 6 in the manner illustrated in Figure 1.

The apparatus employed to effect the desired adhesive union between the end closure 6 and the container body 5 includes a ring or disk 11 formed of some deformable material, such as rubber, or a suitable substitute. The upper and lower faces of the disk or ring 11 are engaged by plate members 12 and 13, the former being carried at the lower end of an inner tube 14, and the latter being carried at the lower end of an outer tube 15 telescopically surrounding said tube 14. It will be observed by reference to Figures 2 and 3 of the drawings that the suction tube 9 extends downwardly through the tubes 14, 15 into position for

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engaging the end closure 6 in the manner illustrated.

The upper face of the lower plate 12 is outwardly flared as at 16 so as to cooperate with the opposing under surface of the upper plate 13 in providing a space in which to receive the disk or ring 11, said space being wedge shaped in radial cross section.

The deformable disk or ring 11 is so dimensioned as to be readily receivable within the skirt 7 of the end closure 6 when it is in repose as illustrated in Figure 2, but it will be apparent that when the plates 12 and 13 are moved relatively so as to reduce the space therebetween, the element 11 will be deformed outwardly in the manner illustrated in Figure 3 so as to exert pressure against the whole of the circumference of the end closure flange or wall portion 7. It will be obvious that the outward flaring of the upper surface of the lower plate 12 and the resultant provision of the wedge shaped space in which the deformable element 11 is mounted facilitates the desired outward expansion or deformation of the element 11.

When it is desired to effect the adhesive union between the end closure and the container body, the end of the container body is surrounded by half mold members 17 shaped to conform to the exterior of the container body 5 as illustrated in Figure 3. The apparatus in repose, in the condition illustrated in Figure 2, is then actuated to exert outward pressure against the end closure flange or wall portion 7. This is accomplished in the manner previously stated by bringing the plates 12 and 13 together in a manner for deforming, or outwardly expanding the disk or ring 11 in the manner illustrated in Figure 3 for tightly pressing the skirt 7 against the body 5 throughout the whole circumference thereof. The confining half mold members 17 oppose the outward pressure exerted by the deformable element 11, and the pressure against the end closure skirt is held for an interval sufficient to assure proper setting up of the adhesive, after which the pressure is released and the closure container body is separated from the apparatus. An interval of twenty seconds or more may be found desirable to assure the setting up of some forms of adhesive.

The pressing of the closure body skirt 7 and tightly holding the same against the opposing wall of the container body 5 in the manner hereinabove described tends to force the adhesive

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vehicle and also the adhesive into the pores of the paper container parts 5 and 7, as indicated at 18 in Figure 3, and results in the formation of an adhesive union which is so efficient as to defy separation of the parts without tearing of the paper.

It is to be understood that the details of construction of the cooperating parts can be variously changed without departing from the spirit and scope of the invention, as defined in the appended claim.

What is claimed is:

Apparatus for effecting an adhesive union between a paper container body and a cup shaped paper closure inserted in an end thereof and having an outwardly directed skirt with an adhesive applied to the outer surface thereof or on the internal wall portion of the body which it opposes, said apparatus comprising, a deformable disk having an edge portion dimensioned to be freely insertible within the closure skirt when in repose, upper and lower plate members engaging at opposite faces of said disk and effective when moved relatively in a direction for reducing the space therebetween to deform the disk between them and cause it to be extended outwardly and tightly press and temporarily hold the skirt against the body throughout the whole circumference thereof, a tube member carrying one of said plates, a tube member carrying the other of said plates, said tube members being telescopically arranged one within the other, and a suction tube extending through said tubes into position for engaging and holding the closure during insertion thereof into the body end.

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