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PAPER CONTAINER, METHOD FOR TIGHT SEALING  
A PAPER CONTAINER AND BLANK FOR  
PAPER CONTAINER  
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2 Sheets-Sheet 1

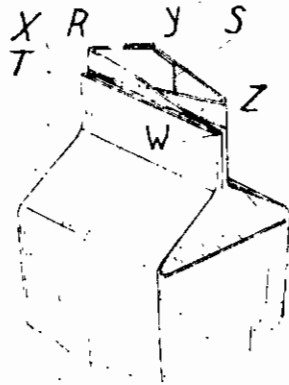


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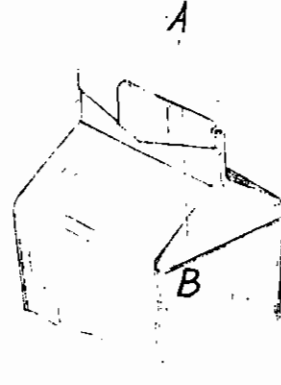


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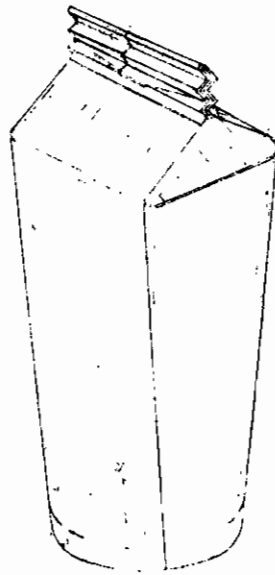


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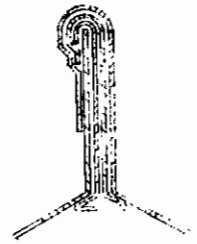


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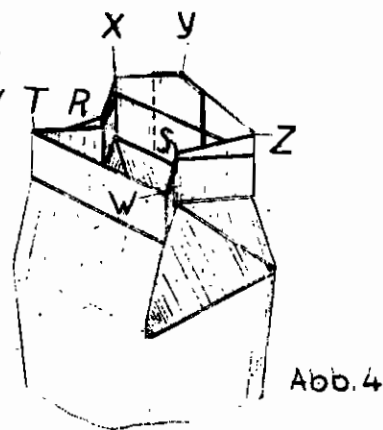
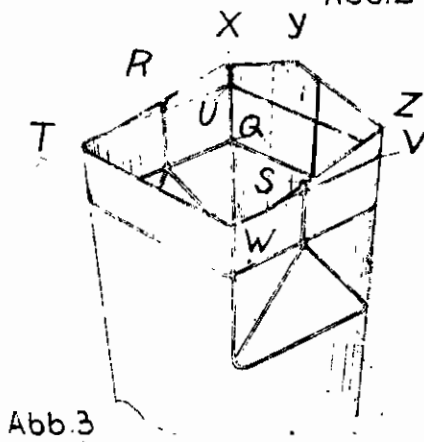
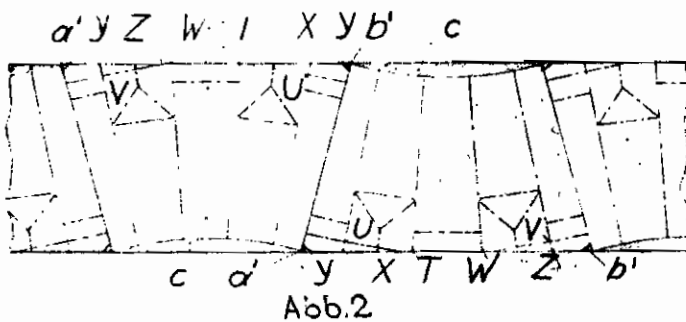
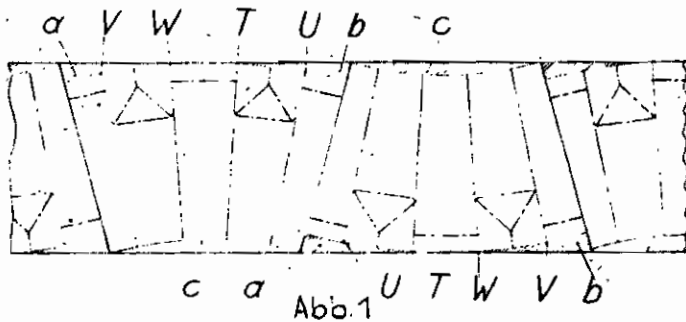
BY *Arthur* ATTY. INVENTOR  
Harry Lehmann

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2 Sheets-Sheet 2




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# ALIEN PROPERTY CUSTODIAN

## PAPER CONTAINER, METHOD FOR TIGHT SEALING A PAPER CONTAINER AND BLANK FOR PAPER CONTAINER

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The invention relates to a paper container with folded closure as well as a blank for producing such a paper container. The invention furthermore refers to a method for tight sealing the folded closure of a paper container. It is known to provide paper containers with a flat folded closure formed by bellowlike folding of the upper walls. One prefers especially such paper containers, the mouth of which in opened state has a square cross-section and when sealed is folded up -shaped. It is, however, also known to fold the mouth of paper containers which in opened state is square or polygonal, in such a way that in the flat folded closure several bellowlike folds are arranged side by side.

For protecting the flat folded closures of paper containers, U-shaped clips of metal or similar material are pressed on. By employing these metal clips, considerable costs are caused. One has already, under simultaneous heating over the melting point of the means for impregnation, welded together the flat folded closures of paper containers which have been impregnated with wax, paraffine or similar materials, in order to heat-seal (weld) in this way the single paper layers of the flat folded closure by melting the means for impregnation. In such paper containers on one or two of the walls which form the outside faces of the flat folded closure, projecting flaps are also arranged which after folding down of the closure are folded down against the lower part of same. At the heat-sealed (welded) closures of paper containers as mentioned easily difficulties are experienced, the more since the tension in the paper tends to effect a parting of the welding. After discontinuing the pressing-on pressure, the single heat-sealed paper layers particularly then can easily part from each other, when according to the hitherto working method the means for impregnation which serve as means of binding are heated above their melting points, because the liquefied means for impregnation have only a very slight power of binding.

In a paper container with folded closure—according to the invention—the walls which in a known manner have been folded bellows-like to a flat folded closure, have different heights so that the walls mentioned overlap each other in a step-like manner. Preferably, the in the flat folded closure each other steplike overlapping rims of the walls of the paper container, folded against each other, are folded down immediate above the lowest part of rim and are pressed against the lower flat folded part of the closure.

It furthermore corresponds to the invention, in a paper container, the body of which, enlarging to the top, has a length seam, to provide this length seam in that part of the container body which in the flat folded closure projects the other parts of the wall.

The paper containers, formed according to the invention, distinguish themselves by a specially tight and safe closure, because every split existing between two paper layers is closed by the folded adjacent overlapping end. In paper containers which are impregnated with paraffine, wax or the like, the folding closure which follows when employing the invention, is especially well suited to be secured by heat-sealing the means for impregnation. According to further development of the invention the heat-sealing of the closure takes place in such a way that the folded closure is strongly pressed together and at the same time is heated to that temperature that is slightly below the melting point of the means for impregnation. The heating takes place only up to that degree at which the means for impregnation tends to stick to a similar material under the influence of pressure. The complete softening or liquefaction of the means for impregnation is, however, avoided; it is prevented that the melted means for impregnation drop into the container to be sealed and infect the contents. It is furthermore avoided that the folded closure, after releasing the pressure, opens again under the influence of the tension in the paper, since the power of binding of the means for impregnation which have only been slightly heated in the mentioned manner is—contrary to the power of binding of the completely softened means for impregnation—sufficiently strong to resist the tension of the paper.

For the production of paper containers enlarging conically to the top—according to the invention—only such blanks have to be considered in which that rim, which later forms the upper rim of the paper container, is limited by a nearly straight line extending nearly over half of this rim. In a blank of which a paper container enlarging to the top, with a square folded closure when opened, is produced, it is in accordance with the invention that the blank at that rim that later forms the upper rim of the paper container is limited by a nearly straight line which extends at least over 3 sides of the folding closure of the paper container to be produced and being square in open state.

For demonstrating the invention, in the following a paper container, a blank serving for pro-

ducing this paper container and the method for sealing the paper container are described.

Figure 1 illustrates the usual arrangement of the known blanks in the paper web of which they are being cut out,

Figure 2 illustrates the arrangement of blanks according to the invention in a paper web of which they are cut out,

Figure 3 illustrates the upper part of a paper container according to the invention with full opened part of closure,

Figure 4 illustrates the same container with half-closed closure,

Figure 5 illustrates the same paper container with flat folded closure,

Figure 6 illustrates the same paper container after folding the upper rim of the flat folding closure,

Figure 7 illustrates the paper container with pressed and heat-sealed (welded) folding closure,

Figure 8 illustrates in an enlarged scale a section through the closure according to line A—B of Figure 6.

For the production of paper containers with a folded closure which in opened state has a square cross-section and which is folded  $\Sigma$ -shaped the blanks are cut out of a paper web in a known manner, as illustrated in Figure 1. The points UTWV form on the paper container to be produced the corners of the square-shaped mouth. In the cutting-out mentioned only little waste is caused. The waste caused for a single blank exists only of the three in Figure 1 by dotted lines marked faces *a*, *b*, *c*.

It is in accordance with the invention to form the blanks according to illustration 2. The waste is considerably reduced since the waste caused for a single blank is only according to *a'*, *b'* and *c*. It is obvious that the waste *a'* and *b'* is considerably smaller than the waste *a* and *b* which results according to Figure 1. The blank is by utilizing the paper, which formerly was scrapped as waste, enlarged to such an extent that it extends over the hitherto existing lines TU and WV respectively, according to the lines TXY and WZY respectively. From such blanks the paper containers are formed which are shown in illustrations 3—8. Whilst the up to now customary paper containers at the upper rim mostly are limited by the lines TUVW extending parallel to the bottom, the closure part of the paper containers shown in illustrations 3—8 is extended over the mentioned lines TUVW up to the upper limit-line TXYZW. On the line TW the upper rim of the container mouth runs parallel to the bottom; the limit lines TX and WZ rise diagonally; at the 4th side the upper container rim forms a flap XYZ. At this side also the length seam of the container body is provided.

When the folded closure is folded flat, the adjacent paper layers overlap each other step-like which is shown in illustration 5. The front side ending in the rim TW of the paper container will be overlapped by the adjacent parts of the bellow-

like folding, since the rim lines TR and WS extend over the edge TW. These again are overlapped by the rims RX and SZ of the adjacent paper layers over which again the flap XYZ projects which is formed by the rim of the 4th container side. The illustrations 6—8 show that the each other overlapping parts of the folding closure, which extend over the lowest rim line TW, are folded down against the lower part of the flat folded closure. The split adjacent to the front part of the container is covered by the folded rims TR and WS of the adjoining folded parts of the container wall. The next overlapping is formed by the folded rims RX and SZ. The split which is between the last (4th) container wall and the bellow-like folded wall parts is overlapped by the folded flap limited by the rim line XYZ. The position of the folded parts and particularly the step-like overlapping is especially illustrated by Figure 8 from which is to be seen that nowhere one flap to be folded has to cover several splits by which the safe closure of the splits would be undecided.

For security, a clip of metal, Bakelite, Celluloid or any other suitable material can be pressed in a known manner over the folded closure described as above, and the upper part of which is folded. In paper containers which are impregnated with paraffine or the like, the formed closure can also be secured by heat-sealing (welding) the means of impregnation. For this purpose the folded closure is strongly pressed between jaws and at the same time heated to a temperature which is slightly below the melting point of the paraffine. Under the simultaneous influence of pressure and heating, the paraffine becomes pliable so that it fills the slight roughness and unites the paper layers pressed against each other. Preferably, the pressing jaws are formed in a known manner in such a way that, as illustrated in Figure 7, the closure is provided with longitudinal wave-like lines or the like. The heat-sealing mentioned is especially effective in consequence of preforming the paper container in accordance with the invention. The front part of the paper container which ends in the rim TW and the adjacent bellow-like folded wall parts are not only kept together by heat-sealing the inner face of the mentioned front part of the paper container, but also by heat-sealing the folded, in the rim lines TR and WS ending, overlapping parts. In a similar manner the closure is also secured against the tension of the paper and other arising stress by heat-sealing (welding) the further step-like overlapping parts, the rims of which are defined by the rim lines RX, SZ and XYZ.

The methods according to the invention are especially effective when dealing with the paper container, which is folded  $\Sigma$ -shaped. They may, however, also be employed advantageously in other kinds of folding, for example in such cases in which several bellow-like folds are formed immediately adjoining each other.

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