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LINED CONTAINER FOR VACUUM PACKAGING

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2 Sheets-Sheet 1

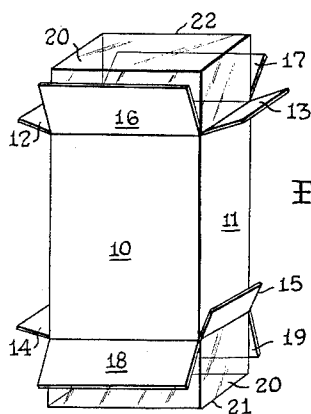


FIG. 1.

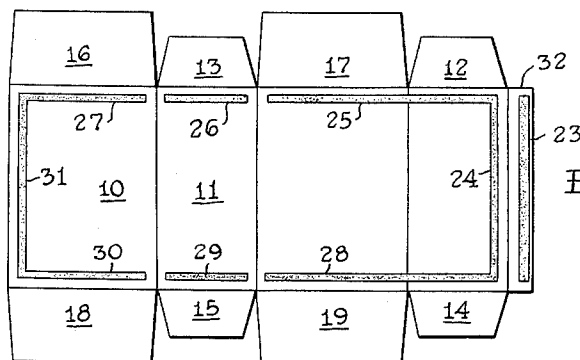


FIG. 2.

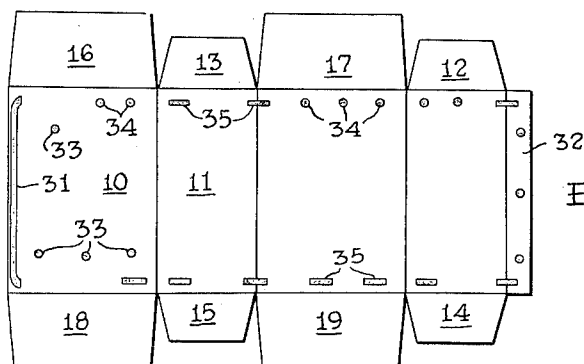


FIG. 3.

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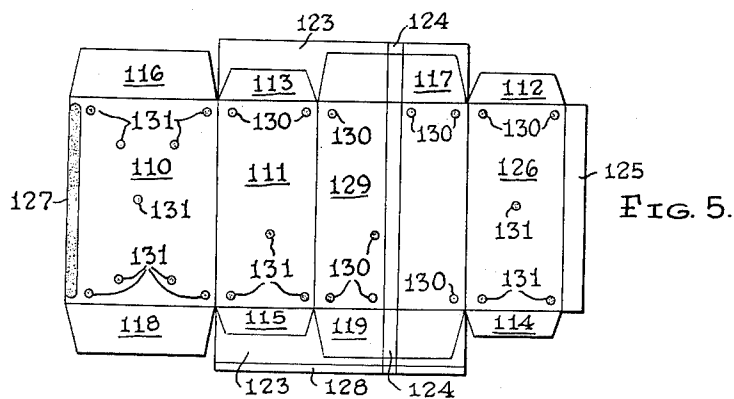
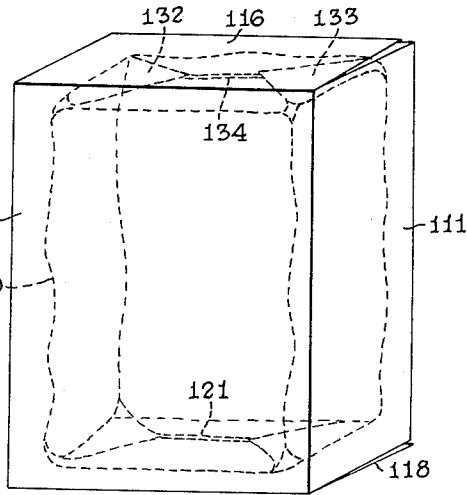
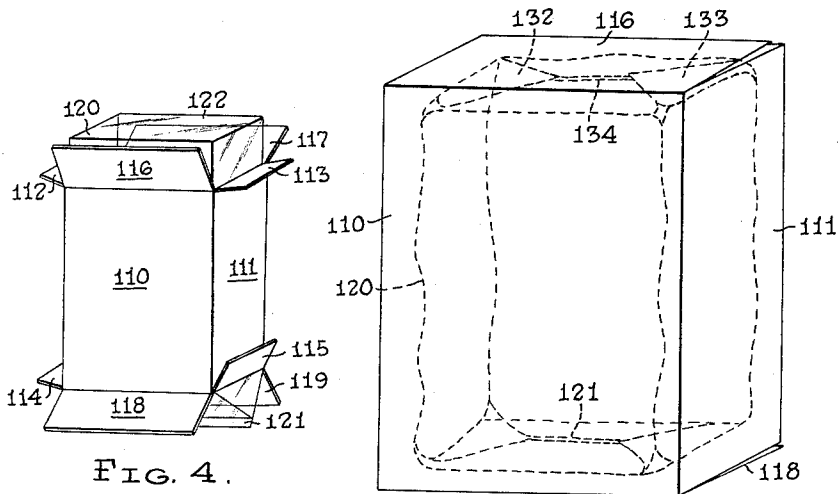
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2 Sheets-Sheet 2



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LINED CONTAINER FOR VACUUM PACKAGING

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The present invention refers to a package intended for vacuum-closing and consisting in an outer cardboard part as well as a lining or bag fixed thereto. The lining is of such a kind that the package is adapted for vacuum-closing.

One kind of packages, consisting of an outer cardboard part and a lining provided therein, have earlier been used for packing all different kinds of material, such as coffee or other aromatic stuffs, soap powder or other very finely divided stuffs, and so on.

Such packages, provided with a lining, have thereby been made in such a way that a cut blank of cardboard has first been produced and thereafter the lining material has been fixed to the side of the cardboard blank by means of glueing, pasting or in other suitable way, which in the thereafter following bending along the present creasing lines will form a tube-shaped, flatly collapsed package. These packages have thereafter been closed in such a way that the package has been broken up into rectangular cross-section, the lining has been closed in its bottom, for instance by so-called plane closing, the outer package of cardboard has been closed in its bottom, the package has been filled with an adapted quantity of the material to be packed therein, the lining has been closed at the top, for instance by so-called plane closing, and finally also the outer package, consisting of cardboard, has been closed at its top.

However, there has also existed another kind of package in which the inner package did not consist in a lining attached to the inner surface of the outer package but in a loosely arranged bag which was often not introduced into the outer package until after it was filled with the goods to be packed. Such packages have also been called bag-packages.

As long as it only was a question about packing the goods under normal air pressure, the bag-package had the advantage that one could, after breaking the outer package of cardboard, take out the bag inside the same for opening and emptying it, which, under many circumstances, could mean certain possibilities of more easy executions. At the production of the packages, one could further fill a great number of bags with a unitary product, but thereafter insert the filled bags in different outer packages of cardboard, for instance provided with different print, for delivery to different consumers who were accustomed to products of a certain brand, or for other reasons set store by the print appearing on the outer cardboard package. This could, for instance, be the special label of a retailer in a certain variety of coffee, and the experience has shown that customers often prefer coffee, packed with a certain label, to exactly the same coffee, packed with another label. One disadvantage with bag-packages was, however, that the bag might not necessarily assume the form it ought to have for facilitating the inserting of it in the outer packages, but this has been of no greater importance with respect to packages for products under normal air pressure, as there was no difficulty to flatten the bag by hand in the required places for adjusting its form.

Under corresponding conditions, lined packages had instead the advantage that one could close them in a more easy way. Especially, it was combined with great difficulties to close bag-packages by machine, to form them for insertion in an outer package of cardboard, to make this insertion, and finally to close the outer package.

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In practice, this could scarcely be accomplished mechanically under avoidance of too extensive wastage. On the other hand, it was possible, with regard to lined packages, to execute the closing in one single rapid step in a machine, that being of especially great importance when the question was about mass-production. Within the modern packing industry, one requires nowadays as a rule capacities of ninety closings a minute per machine, and in the future, these requirements will, most probably, be still more increased. It is quite obvious that such working capacities could, under no circumstances, be satisfied at machine closing of bag-packages with an outer package, produced according to current methods.

From the foregoing, it should be evident that each kind of package has its advantages as well as its disadvantages, as long as the question is only about a package at normal air pressure. Now, however, packing technics have developed to such a point that for certain kinds of products one has to an ever increasing extent gone over to use vacuum packing.

The present invention is based upon the desire to use these kinds of packages for vacuum packing of such material that is sensitive to the influence of the outer atmosphere. As a typical example, reference could be made to packing of ready-ground coffee. Roasted coffee contains a great number of aromatic ingredients, to the major part consisting of aromatic oils. Without exception, these are subjected to an oxidation process, when they are stored under conditions, where the oxygen of the atmosphere can come into contact with them, corresponding to, for instance, the rancid phenomenon with butter oils. In easier cases, the coffee will only lose its special bouquet, but in more difficult cases, the coffee will get a disagreeable taste and, in very extreme cases, it may even be dangerous to the health. Tests have proved that, as a rule, one cannot count with the coffee retaining its aroma intact for more than six weeks, but during the warm season, it may lose its aroma in a considerably shorter time.

In order to avoid this, one has tried to pack coffee in vacuum-tight inner packages which, besides, have been mounted in outer packages. The pressure of the inner package has thereby been brought down to only some few millimeters of mercury. The proper inner package must thereby, whether it is made as a bag or as a liner, be vacuum-tight and simultaneously so soft and pliable that it without difficulty can assume its new shape. During the evacuation, air is, as a matter of fact, sucked out from the package, and this will thereby be compressed to a considerably smaller volume, but will, at the same time, become hard so that it very nearly suggests a clump of some soft wood (ash, balza or the like).

Tests, made during the creation of the present invention, gave however, in the beginning a rather dissatisfactory result. The reason therefor was found to be the following one: In order to be able to produce the package, provided with a lining, in a rational way in its evenly compressed form, in which it is delivered to the customer for packing therein the stuff, the material, or the like, which the customer wants to distribute in the package, it was necessary that the lining was fixed to the inner side of the outer package of cardboard by means of such a binding stuff as mentioned above, in the following as a matter of simplicity named "pasting." A further reason for the desire to have the lining rigidly fixed to the outer package of cardboard was that the closing of the lower and the upper lining mouth should take place in an even and tight way, and it was thereby of importance that the lining material should be kept stretched and even, which was best executed by pasting it to the inner side of the outer package. One had thus always tried to provide a strong and reliable pasting

connection between the outer side of the lining and the inner side of the outer package.

When one is now replacing the lining with a lining of a vacuum-tight plastic in order to vacuum-pack the material, this takes place in the way, that the lining is first welded together in the bottom and the outer package is closed in this place, whereafter the packed material is filled in. While still being open at the top, the package is introduced into a vacuum chamber, usually in such a way that it is transported into one department of a carousel with normal air pressure, and thereafter, during the revolving of the carousel, is put into connection with a vacuum conduit, and successively evacuated. When the package is still in the vacuum chamber, the lining is welded together in the top and the package is thereafter fed out. The intention is that the outer part of the package should now under normal air pressure be closed in the top, but often, this is not possible. When the package is passed out of the vacuum chamber and subjected to the pressure of the outer atmosphere, the vacuum-tightly closed lining together with the material present therein is, as a matter of fact, compressed to a very high degree. The volume of the lining together with the material present therein may, as a matter of fact, decrease to about half part of the normal volume in atmospheric pressure. Simultaneously, the lining with its contents is compressed to such a hardness that it is rather like a semi-soft piece of wood.

As the lining was fixed to the inner side of the outer package, this outer package is, however, also participating the shrinkage movement, but as it is made of a more firm and stiff material, it is wrinkled into such a strong, irregular deformation that the closing of its top was usually not possible. The package as a whole gets a less beautiful appearance, it will no longer be rectangular, it can not be piled up, and so on.

Attempts to close bag-packages in the above mentioned manner were also not met with any success. The reason for this was the following one:

For practical reasons, one has to avoid too many welding seams in the plastic bag, forming the inner package in a bag-package. Bags of flat-bottom type (canister type) can therefore not be used, but the bags must be made in the way, used with so-called bakery bags, that is, made with only one single welding seam running across the lower mouth, only one single welding seam across the upper mouth and only one single longitudinal welding seam. When such a bag is filled, projecting, so-called ears will be created at the corners, whereas at the middle part, the bag will assume a well-rounded, nearly oval form. Such a bag can very easily be flattened by hand or in the machine after filling and closing, if there is no vacuum, so that it can then be introduced into the outer package, rectangular in cross-section, but if the bag is vacuum-closed, the contents have stiffened to such a degree that a re-shaping of the bag together with its contents is no longer possible without running the risk of breaking the inner package. Its form will then make it impossible to introduce the closed and evacuated package into an outer package, in the hitherto usual way.

The purpose of the present invention is to avoid this disadvantage, while creating a type of package which has all of the advantages of bag-packages, but none of their disadvantages.

Thereby, one starts from the known fact, that the bags for bag-packages are usually produced in the way, that a continuous path of the bag material is moved over two folding means, each of which folding in one strip along the one or the other outer edge of the path, respectively. The middle part of the path will then form the one side of a long, flattened hose, and the two outer parts, which are welded together along a longitudinal joint, together form the other side of the hose. This hose is then cut into adapted pieces, and these are closed in the bottom, so that the bags are formed.

At the production methods for the said bag-packages, hitherto used, one used, thereafter, to fill and close the bags and only then to put them into the outer packages. According to the part of the invention, now described, the sequence is reversed in such a way, that the bags are, either after, or even before, having been closed in the bottom, loosely combined with the outer package, so that they are placed in the interior of the outer package at the subsequent filling and closing at the upper end. This will, thus, mean an approach to the principle, earlier applied with respect to the lined packages, but the method and the bag-package differ from that, used at the lined packages, thereby, that the proper bag is so loosely combined with the inner side of the outer package, that, at the shrinking during the evacuation, the bag will come loose from the outer package without deformation of same. In its ready filled and closed state, the package as a whole will thus be a bag-package. After opening the outer package, one can thus, without further, take out the bag and use it in one way or another, in the way characteristic of bag-packages. One can, for instance, empty its contents into another container under the more easy conditions, considered to exist, when it is not necessary to handle an outer package, made of stiff cardboard, at the emptying.

According to the invention, the lining or the bag, respectively, is fixed to the inner side of the outer package by point-pasting which, with regard to position as well as to the magnitude of the points is distributed in such a way, that the firmness of the pasting is certainly sufficient for retaining the lining in position during the treatment of the package, when it is made and is preliminary closed and filled in normal air pressure, but that the pasting shall no longer be capable of retaining the lining or the bag, respectively, in connection with the outer package against the firmness of same during the shrinkage action, when the package, after fulfilled vacuum closing, is again subjected to the pressure of the outer atmosphere.

In this connection, it is of great importance that the pasting is made as more or less pronounced point-pasting and not, as earlier was always the case, as border pasting. A long, unbroken border of paste, will, as a rule, retain the lining to the outer package against the resistance against deformation, caused by the stiffness of the outer package, and this will apply, also if the unbroken border is very narrow. A number of small point-pasting places, on the other hand, are broken even if their total fixture surface should be just as big, or even bigger, than the total fixture surface at border pasting. This is due to the same phenomenon that is also observed when tearing off a perforated piece of paper. It is easy to tear off the paper along the perforation line, but it is exceedingly difficult to tear a paper apart by pure pulling, even if the paper has no greater width than the total width of all of the perforation bridges.

If the package is kept in vertical position during the evacuation and during the subsequent subjecting to the pressure of the outer atmosphere, the packed material will, due to its gravity, be mainly collected in the lower part of the lining. Obviously, the compression will therefore be less in this part and greater in the top part, and it is also in the top part that the loosening of the lining or the bag, respectively, from the outer package starts. It is therefore important that the point-pasting is represented by smaller and/or more sparsely placed points in the top part, whereas the points can be extended to continuous, shorter borders at the lower part of the package.

After the detachment of the lining or the bag, respectively from the outer package, the lining or the bag will fully or partly be in a non-bound relation to the closed outer package. The lining or the bag is, thereby, deformed, but the outer package will retain its spruce and pileable form, rectangular in cross-section in all directions. When, later on, the lining or the bag is opened by making a smaller or bigger hole therein, so that air from the out-

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side can be pressed into the package, this will immediately swell out again, and the lining or bag together with the packed material will fill out the outer package so well that it will not be disturbing that the lining or bag is no more by pasting in special order fixed to the outer package.

Below, the invention will be further described in connection with a chosen embodiment thereof, which is shown in the attached drawing, in which

FIG. 1 shows a perspective picture of a package of the present kind, after it has been folded out into its rectangular cross-section, but before it has been closed at the bottom,

FIG. 2 shows the evenly flattened blank of the outer package in the earlier known packages, and

FIG. 3 shows the corresponding blank of the outer package in a package according to the present invention, intended for vacuum closing.

FIG. 4 shows an outer package with a bag of transparent plastic, whereas

FIG. 5 shows a scheme for the pasting between the inner side of the outer package, on the one hand, and the outer side of the plastic bag, on the other hand.

FIG. 6 shows a section through the flattened hose which, after having been cut and welded together in the bottom, will form the bag, and

FIG. 7 finally, shows a so-called X-ray picture of a bag-package which is filled and closed. But it should be observed that the invention is not limited to the embodiment, thus shown, but that different modifications can be made within the scope of the invention.

The outer package in the arrangement according to FIG. 1 consists of four sides of which only the long side 10 and the short side 11 are visible. At each short side, a closing flap 12 and 13, resp., or 14 and 15, resp., is connected by means of creasing, and at each long side, a closing flap 16 and 17, resp., and 18 or 19, resp., is in a corresponding way connected. Through the outer package, the hose-like lining 20 is extending and fixed to the inside of the outer package and being, in this case, assumed to consist of a weldable, thin, transparent plastic.

The closing and packing is made in the following way: First, the lower mouth 21 of the lining is flattened, so that a so-called plane closing is obtained, and this is welded together, whereafter its two triangular flaps, projecting at the short sides of the liner, are folded inwards. Thereafter, the closing flaps 14 and 15 of the short sides are folded in, so that they support the lining, and finally also the closing flaps of the long sides are folded inwards, the one above the other one, and they are pasted together so that a steady bottom is formed in the package. This is now filled with the material to be packed, and also the upper mouth 22 of the lining is plane-closed and welded together, yet not completely, but a smaller part of the upper mouth is left in non-welded state.

In its present state, the package is brought into a pocket in a carousel in an evacuating machine, said pocket being under pressure of the outer atmosphere. During the successive revolving of the carousel, the package will move from the position where it was under pressure of the outer atmosphere, into other positions where a vacuum is created, whereby the air, existing in the interior of the package is sucked out, whereas the packed material will be retained. After fulfilled evacuation, also the welding of the upper lining weld will be completed, whereafter the package will be brought out from the evacuation machine.

The moment when the package is again entering the outer atmosphere, the lining is pressed together into a compact, almost stone-like body, and during the compression movement, the pasting connection of the lining with the outer package shall be broken up, if the pasting has been made in accordance with the present invention, thereby that the one pasting place after the other one is being detached, rather like the tearing through the perforation bridges in a normal paper perforation.

After the outward movement of the package from the

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carousel or evacuation machine, the closing flaps of the outer package are closed in a way, corresponding to the just described closing of the closing flaps at the bottom end of the outer package. Owing to the outer package being entirely free from, or at least very nearly free from pasting connection with the lining and the material packed therein, the outer package will keep its parallelepipedal form, so that it will get a neat appearance and be possible to be piled and be free from such breaks and folds which would, otherwise, decrease its firmness and its ability to protect the inner package from outer influence.

It is not possible to give rules, valid once for all, how the pasting points should be distributed. This distribution must rather be determined from case to case, guided by the dimensions of the package, the properties of the packed material, the firmness of the outer package, and so on. One embodiment is shown in FIGS. 2 and 3.

A package of the general type, to which the present invention refers, was manufactured in a traditional way for closing without pre-evacuation. The lining was thereby pasted to the outer package already before this was formed into tube-shape, as shown in FIG. 2. Before the addition of the lining material, paste was, therefore, added as shown by the black lines in FIG. 2. The pasting line 23 was intended to attach to the lining, as well as the pasting lines 24-30. The pasting line 31, however, formed the fixture means for the backside of the connection flap 32, when the package had been given a tubular form. Spaces had been provided between the pasting lines 25 and 26, 26 and 27, 28 and 29, and 29 and 30, but these spaces had not the purpose to provide a better or worse fixture between the outer package and the lining. They were exclusively provided in order to make it possible that certain transportation means should be able to seize the package during the production of same, without being covered by a deposit of scratched off paste.

When tests were made to vacuum pack such packages, it proved that when the outer atmosphere was added it could not penetrate into the space free from air between the lining and the outer package, as the practically unbroken paste line 23-30 insulated this space from the outer air. When the lining together with the package material shrank, it therefore carried the outer package with it, so that this was wrinkled and completely lost its shape, and possibly even torn asunder.

On the other hand, it proved possible to keep the shape of the outer package fully intact by point pasting the package concerned according to the pattern, seen in FIG. 3. This pattern was determined by either of the two following methods: (1) The pasting line 23-30 was divided up into an essentially greater number of small parts, and an evacuation test was made. By the retaining deformation of the outer package, this gave information about the places, where the pasting connection was still too strong, and the parts of the initial pasting line present there were still more shortened, until only points or short dashes were remaining, all under successively repeated similar tests. (2) Under slow letting in of the outer atmosphere into the space, in which the package was placed, its deformation was photographed and, guided by the movement scheme, thus observed for the deformation movement, it was calculated, how the division of the pasting points should be made.

As expected, it proved that no change of the pasting line 31 was required, nor allowable. On the other hand, the pasting lines 23 and 25-30 had to be divided into a plurality of points 33 and 34 and shorter dashes 35, and the pasting line 24 was entirely abandoned. It is, however, obvious that a scheme for a package of other dimensions or for another material, or with other resistance properties of the material of the outer package, may be rather essentially different.

In this connection, it is to be observed that it proved advantageous, in certain cases to provide pasting points 33 which were not situated in such a way at the edges of the separate sides, as the pasting lines 24-31 in FIG. 2.

These, in the interior of the surface of a side existing pasting points should, however, only occur on one single side. They are loosened with greater difficulty than the remaining pasting points, and often they remain even after the outer atmosphere has been let in into the vacuum closed package, without the dimensions of this package being deformed. They are thereby exclusively useful, as they cause such a lasting connection between the outer package and the lining, which can be of value after the lining has been broken and air has been let in into the packed material, as the package ought to have the same properties after this as was the case at the earlier used, not vacuum-closed packages.

Bag-packages of the kind, shown in FIGS. 4-7, are intended to be delivered by special package manufacturers to wholesale dealers, manufacturers, or the like, of the product to be packed, and in connection with the production of the product, for instance the roasting, blending and grinding of coffee, the product is introduced into the packages which are thereafter closed.

In order that the packages, during the time before being taken into use by the wholesale dealer or the manufacturer, shall not require unnecessarily big space, they are, like the lined packages, delivered folded together to even formation or, as it has also been called, in a collapsed state. They are then unfolded, immediately before being filled with the packed goods, so that they become rectangular in cross-section. FIG. 4 shows a package of the type intended in the present case, which has been unfolded into rectangular state in cross-section.

The outer package in the arrangement according to FIG. 4 consists of four sides, of which only the broad side 110 and the narrow side 111 are visible. At each narrow side, there is by creasing connected a closing flap 112 or 113, respectively, and 114 or 115, respectively, and at each broad side there is, in a corresponding way, a closing flap 116 or 117, respectively, and 118 or 119, respectively. Through the outer package, the proper bag is extending, said bag being, either already in this state or later, but before its filling with the packed goods, closed in the bottom. The bag, which in the drawing has been shown closed in the bottom, is indicated by 120. By a weak pasting it is attached to the inside of the outer package and consists in this casing of a transparent, weldable plastic. From the drawing one can see that the bag has the character of an ordinary bakery bag, the bottom seam of which or, more correctly, as the bag is made of a plastic, the bottom weld of which being indicated by 121. The bag is, however, already in advance arranged in the interior of the outer package, before it is filled with the packed material, and thereby it has got to the form rectangular in cross-section, determined by the stiff cardboard from which the outer package is made. The mouth 122 of the bag will therefore also be rectangular.

The manufacturing of the outer package and the bag can easily be made in the same operation, in a way fully corresponding to the one, earlier used in the manufacturing of line outer packages. Hereby, one has cut out ready pieces, so-called blanks, of the outer package, as shown in FIG. 5, and these have been provided with creasing lines, partly between the separate sides, facing each other, partly also between each of said sides, on the one hand, and the closing flaps connected thereto, on the other hand. Before the folding together of the cardboard blank, a bag blank 123 is, however, added, as shown in FIG. 5, said bag blank also being cut in advance or possibly folded together and provided with a longitudinal joint during the cutting. This bag blank is shown in section in FIG. 6. It should be observed that it is important for the future closing that the longitudinal weld joint 124 is placed about at the middle of one of the broad sides of the outer package. In order that this bag blank shall be kept in correct position relative to the cardboard blank, the bag blank must, however, be pasted to the cardboard blank with a connection which, on the one hand, is sufficiently

strong to make the bag blank follow the cardboard blank during the transportation of said blank through the subsequent machine devices by which the cardboard blank is folded and connected to tubular form by connection of the connecting flap 125 to the left edge of the broad side 110 in the drawing, FIG. 5. The pasting connection, on the other hand, must be so weak that the bag will easily become unstuck at the continuous treatment of the package, neither the bag, nor the outer package thereby being damaged. The loosening of the bag from the inner side of the outer package may take place in connection with the mechanical opening of the collapsed outer package, but if the package shall be used for vacuum closing of the packed material, experience has shown that no separate step is required for loosening the bag from the outer package, but that this loosening step will automatically take place, when evacuation takes place, and thereby the total outer enclosing volume of the bag shrinks.

It should be observed that the bag is assumed to be made of transparent plastic and therefore the outer cardboard blank will be visible in FIG. 5 through the bag 123, placed over said blank.

When joining together the outer package into tubular form, its short side 126 together with the connection flap 125 are folded upwards and turned over to the left in FIG. 5, and further the broad side 110 is folded upwards and turned to the right, so that the edge of the broad side 110, situated to the left in the drawing, but later on situated to the right, will lie over the connection flap 125. For attaching the flap 125, the edge part of the broad side 110 is for this purpose provided with a strong paste streak 127. When here is spoken about paste, it should be observed that thereby is to be understood any binding stuff suitable for the purpose, thus not only proper paste but also different kinds of glue, plastic glue, and so on.

It is without importance for the invention, whether the bags 123 is closed in its bottom 128, already when added to the blank of the outer package, or the bottom closing of the bag takes place after the bag blank has been added to the blank of the outer package. As a matter of fact, the bag blank projects below the edge of the closing flaps 114, 115, 118, 119 so far that the closing in the bottom of the bag 123 can be made at any time, even immediately before the filling of the package with the packed material. At the embodiment of the invention, shown in the drawing, it is certainly assumed that the bag is closed in the bottom by a welding joint 128, before the folding together into tubular form of the outer package blank is made, but, as said above, this is not of crucial importance for the invention.

Irrespective of whether the bag is already closed in its bottom 128, or this takes place only at a later time, the bag shall, however, remain in its correct position inside the outer package right up to the moment for filling the package with the packed material and closing it in vacuum. For this purpose, the bag is attached to the sides 111 and 129 by means of a small number of small paste spots 130 which together shall give such a weak connection that, at the shrinkage of the bag by evacuation, said connection will be broken when being opened by hand or mechanically, or when the bag is evacuated, without any damage thereby occurring, and especially no indentation in the outer package.

It has been said above that the packages of the general kind, to which the present invention refers, are usually delivered by package manufacturers to wholesale dealers or manufacturers of the packed goods in a collapsed state and that they, therefore, must be opened into a state, rectangular in cross-section, before being filled and closed, possibly after evacuation. The fact that the outer package is made of cardboard or similar stiff material, makes that it is an extremely good means to bring about also the opening of the bag to the state, shown in FIG. 4. In order that the bag shall follow the outer package in

the opening movement, it is, however, required that the bag shall also be attached to the inside of the outer package at the sides 110 and 126, or one of them. For this purpose, the inner surfaces of these sides, or one of them, are, immediately before the folding together of the outer package from the state, shown in FIG. 5, into a state tubular in cross-section, but collapsed, provided with still more weak paste spots for connection to the outer package, and this connection shall in all essentials be as weak as the connection by means of the paste spots 130, but nevertheless so strong that, when the outer package is opened into rectangular cross-section, the bag will follow the said sides of the outer package, overcoming the resistance that may arise due to the weak vacuum-formation in the bag, because of its sides "sticking" together. These paste spots are indicated 131.

After opening the package, but while the bag is still assuming the correct position inside the package, it is suitable to fold the closing flaps in the bottom of the package, either inwards or outwards into a position perpendicular to the sides of the package. If they are folded inwards, one can as well simultaneously close the outer package in the bottom, in which case the bag bottom will automatically obtain rectangular form, as in a flat-bottom bag. If, on the other hand, technical closing reasons should prove it more suitable not to close the bottom of the outer package at this state, the closing flaps could instead be folded outwards and the package be placed on a flat support, the bottom of the bag also in that case being automatically flattened into rectangular form. It is true, that in any case so-called ears will appear at the under edge of the bag, but these ears will be flat and not filled with the packed material and it is therefore possible, without violating the stable form of the bag, existing after the evacuation, to fold these ears inwards so that they will not form an obstruction in the interior of the outer package.

The conditions are, of course, quite equivalent in the upper part of the bag after it has been evacuated and closed by welding of the mouth 122. It is seen from FIG. 7, how the two ears, thereby arising, are folded inwards so that they do not take up any room within the outer package. The ears are there indicated 132 and 133 and the welding joint of the mouth is indicated 134.

It is also seen from FIG. 7 that the bag, thus tightly closed and evacuated, will be positioned quite freely in the interior of the outer package, as the different paste connections, indicated by 130 and 131, respectively, have been broken at the evacuation of the bag and the shrinking thereof simultaneously occurring. One has, therefore, with very simple, but at the same time effective means provided a typical bag-package with outer package of cardboard, which has all the special advantages of such a package, but at the same time one has avoided the disadvantages which particularly occur at vacuum-closing of bag-packages, especially the projecting ears, and which caused that it was hitherto impossible to produce bag-packages that were vacuum-closed and also enclosed in outer packages of only unessentially bigger volume than the bag itself with its contents. When opening such a bag-package with outer package, one proceeds in the same way as was earlier always the case when opening ordinary bag-packages in the above mentioned sense, even

if these were not vacuum-closed. Thus, one breaks the closing flaps of the outer package, either at the upper or at the lower end, and turns the outer package upside down, whereby the inner package will instantly fall out. This is thereafter treated the same way as an ordinary vacuum-closed bag, that is with some suitable sharp object, the point of a knife, a pair of scissors, or the like, one makes a small hole in the plastic material, through which the air gets an opportunity to enter the bag which will at once with a hissing sound swell out to normal size. Thereafter the bag is opened, for instance by cutting off the upper welding edge 134, and the material can thereafter immediately be poured out from the bag.

As a summing up, one can say that by the present invention a package has been provided, consisting of a vacuum-tight inner package and an outer package of cardboard or other similar stiff material, said package combining all of the advantages that could earlier be found either in lined packages or in bag-packages, but that did not previously occur simultaneously in one and the same package.

What I claim is:

1. A lined container for containment of vacuum packed contents comprising an outer carton having a central portion and end closing flaps, an inner lining of flexible material, and a plurality of spaced adhesive means connecting said inner lining to said outer carton, said adhesive means being disposed along the periphery of said central portion and essentially limited thereto, whereby said lining is firmly connected to the carton during preliminary filling and sealing operations and during evacuation of the package but easily separated from said carton when the package is subjected after evacuation to atmospheric pressure.

2. A package according to claim 1 including adhesive means connecting said inner lining to said outer carton which means is disposed along one end edge of said central portion and extends unbroken along said edge.

3. A lined container for containment of vacuum packed contents comprising an outer carton having a rectangular central portion and end closing flaps at the top and bottom of said central portion, an inner lining of flexible material, and a plurality of spaced adhesive means disposed along the periphery of said central portion and limited substantially thereto, said adhesive means firmly securing said inner lining to said outer carton during preparatory closing and filling and during evacuation of said package but being of such strength and position so that the inner lining will completely separate from the outer carton when said package is subjected to atmospheric pressure after evacuation.

4. A package according to claim 3 including adhesive means extending unbroken along one end edge of said central portion and limited substantially thereto.

References Cited in the file of this patent

UNITED STATES PATENTS

695,273	Birnie	Mar. 11, 1902
2,159,835	Waters	May 23, 1939
2,387,272	Klein	Oct. 23, 1945
2,432,052	Waters	Dec. 2, 1947
2,599,708	Gottesman	June 10, 1952