

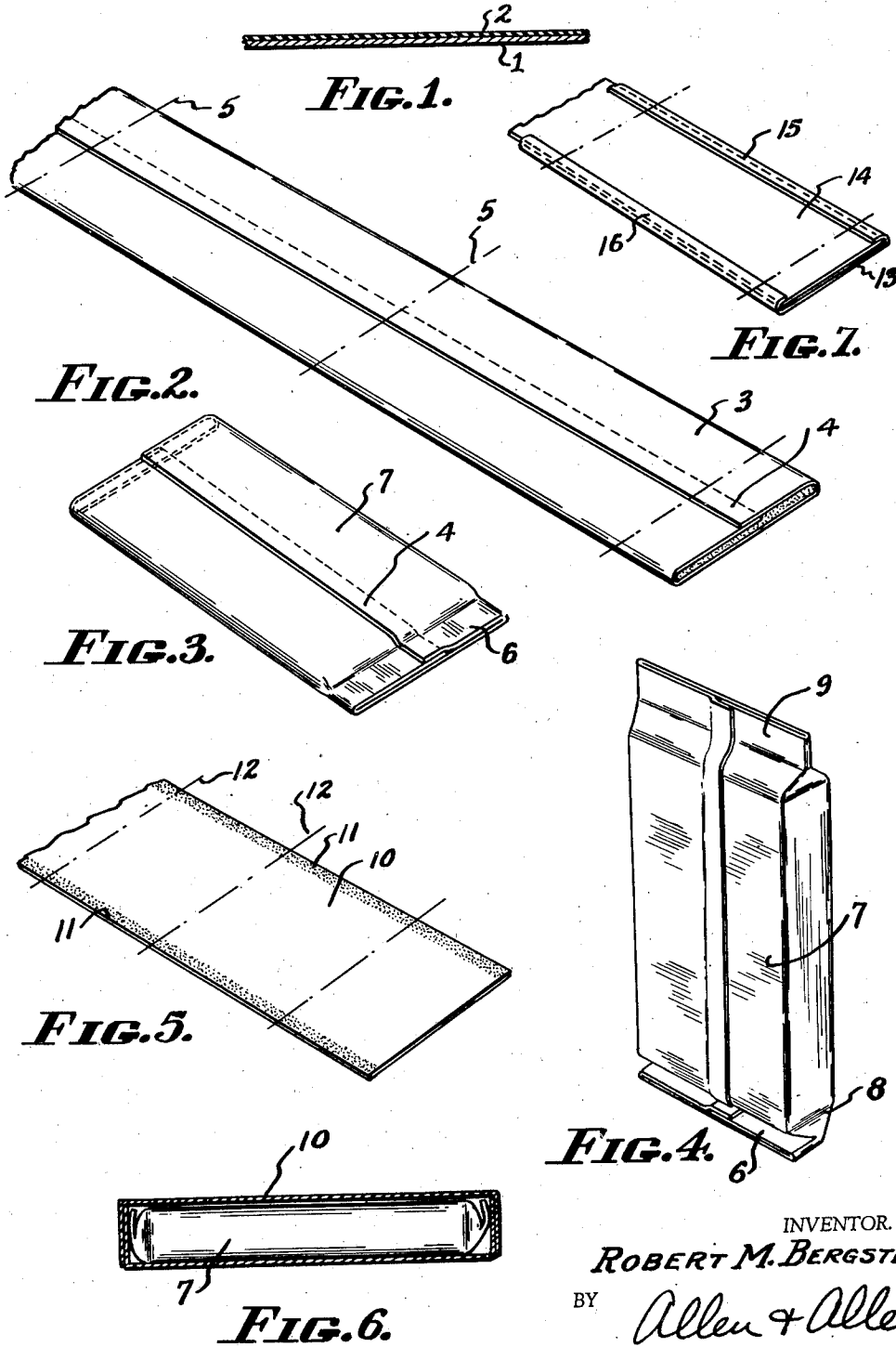
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CONTAINER

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2,154,083

CONTAINER

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My invention relates to the provision of a bag or liner for cartons which is air-tight and leak-proof, the problem involved being one of forming an inexpensive bag, and at the same time sealing the ends thereof so that all pin holes are effectively avoided, and a permanent, impervious joint produced. In my application, Serial No. 37,553, filed August 23, 1935, I describe one mode of sealing containers which is applicable to and included within my present invention in its broader aspect. In that application, I teach how to form a leak-proof joint, using adhesives which are treated with solvent. I will also disclose in the following specification other adhesives.

One important aspect of my invention lies in the structure of the bag itself, wherein ordinary bag construction is departed from, due to the fact that in endeavoring to tightly seal bag structures, it is impracticable to attempt to do so where there are any relatively thick, overlapping folds of material extending into the areas which are to be sealed tight. For this reason, I may form my bag as a simple tube with a lengthwise seam or seams, and seal the exposed ends tight by uniting the tube walls together, by a strictly flat seal. While this leaves a projecting, semi-rigid portion at the bottom of the bag, and subsequently at the top of the bag, this can be folded out of the way to avoid unsightliness.

It should be noted further in this connection, that when the contents are inserted in such a bag, there will be corners formed in the bag material, and that while there are paper webs which are fairly impervious to cracking at corners, still it is very necessary to protect against any pin holes at such corners by means of a suitable flexible coating on the inside of the bag.

To this end, my invention concerns also the application of films, to the inside at least, of bags of the type in question which are flexible and not brittle, which are impermeable in themselves, and which are relatively inexpensive in the quantities required. A special object of my invention is to provide for the use of latex as the interior coating of the bag, employing said coating as a sealing medium for the bag.

Incident to my invention in its various aspects, is the necessity of applying the material which is to be used in sealing the bag prior to forming the bag itself. My former application above referred to deals, as I have stated, with one type of adhesive which is suitable in the last noted method of making bags, and in the present application I propose to cover the method in general, and in addition, specifically cover the use

of a sealing medium which is heat-plastic, so that the seal can be made by heat and pressure. The above objects and advantages I accomplish by that certain construction and method of procedure of which several examples will be given in the following specification and are illustrated in the drawing, the novelty inherent in the examples being set forth in the claims appended to this specification, to which reference is hereby made.

In the drawing:

Figure 1 is a sheet of coated paper, the coating being, among other things, employed as an adhesive.

Fig. 2 is a perspective of a tube formed of an indeterminate length of paper.

Fig. 3 is a bag cut from said tube and sealed at one end.

Fig. 4 is a perspective view of said bag after being filled and sealed at the other end.

Fig. 5 is a section of a strip of paper of indeterminate length showing the coating at the margins thereof, which is to be cut transversely, forming sections which are then folded to form tubes with the sealing medium at the ends.

Fig. 6 is a view of one of the bags enclosed in a carton.

Fig. 7 shows an alternative form of lapped seam tube to which my invention is equally applicable.

I will describe my invention, using as an example a practice employing latex as an interior coating for the bag. This substance resists the penetration of oils or fats, resists the penetration of air, and brings about a flexible condition in the bag material, which prevents cracking of the corners of the bag when the contents are placed therein, or during shipment or use. Furthermore, that portion of the latex which lies at the two ends of a tubular bag formed of paper coated therewith can be used very satisfactorily as a sealing adhesive.

In making the bag a web of paper is given a coating of latex, preferably for the sake of economy, only on that surface which will lie on the inside of the bag. The latex used by me and sold as latex on the market is not "self sealing" when two coated surfaces thereof are brought together. This latex contains at least two to three percent of casein although the casein content can run as high as ten percent, the required latex being one which is not "self sealing", which is a property of a freshly deposited or dried film of pure latex and renders an exposed pure latex film an inappropriate interior coating of a bag. As

hereinafter described I may supply an additional coating of paraffin to latex, in which case the use of pure latex would be applicable. Thereupon, in any simple form of tube-forming machine, the tube 3 is formed by drawing the bag material past and over a former. The tube former is the standard type, consisting of a sheet of metal, in width conforming to the size of the tube desired to be made, and as the bag material is drawn it is folded over this former, so that the end of the former is completely enveloped by the bag material with the edges of the bag material overlapping. These edges can thereafter be combined or sealed to one another by means of adhesive applied to one of the edges thereof, or can be secured to one another by means of heat and pressure being applied. The heat and pressure will have an effect upon the two edges only, as the metal former is interposed between the overlapping edges and the lower portion of the tube. While these overlapping edges can be permanently and adequately sealed by means of applying adhesive at the time the tubes are being formed, such is not the condition and is not practical in sealing the end of the bags or in bringing about a hermetical closure after the contents have been inserted. Instead of making a single-lapped seam tube, a double seam tube can be used which is made from two webs of paper, Fig. 7, the wider one 13 being folded over the narrower one 14, using familiar tube-forming practice. There are then two seams 15 and 16 instead of a single seam 4. Either form of tube is a lapped seam tube in the sense in which I use the term. As the tube emerges from the tube-forming machine, in which it is formed, it may be cut into sections, as indicated by the dotted line 5, to form tubes open at both ends, and the tubes thereafter may be fed singly either laterally or on a straight line to a machine which would apply heat and pressure to an end 6 of each tube, or predetermined transverse areas of the tube can be fastened by means of a heated roller, a certain part of the periphery of which would contact the tube at predetermined distances to combine transversely certain areas thereof and thereafter can be cut adjacent to said sealed areas. The fact that the latex covers the opposite surfaces that are sealed together at 6 results in avoiding any pin hole at the edge of the seam, because there will be sufficient latex to flow, when molten, into the irregularity resulting from the underlapping ply. When this bag is filled, as illustrated in Fig. 4, there will be corners formed as at 8, which corners are adequately protected by latex coating on the inside of the bag from resulting in cracks or pin-hole leaks. The sealed end 6 can readily be folded under in the operation of filling, during the operation of opening the bag for the reception of its contents. The bag can then be filled with any greasy material or oil, and after the filling is complete, the protruding open end of the bag can be formed by heat and pressure into a sealed end 9, corresponding identically with the sealed end 6.

Bags made by me in this manner have held lubricating oil for an extended period without the slightest sign of leakage. When filled with oil, the bags can be shipped in containers in the same manner as bottles, with protective corrugated paper partitions in the container. Also, when filled, the bag can be placed in any suitable cardboard box or carton 10, and shipped and delivered to the customer in the carton.

Where it is desirable to employ the bag for

food products, an additional procedure is followed, to accomplish two purposes, namely: to prevent the latex imparting an odor to the contents, and to increase the resistance to moisture-vapor-penetration through the walls of the bag. My preferred procedure is to follow the same course as heretofore outlined, except after coating the bag material with latex, I apply a secondary coating of some suitable wax, such as paraffin, which possesses the necessary qualities of being free of pungent odors and being readily meltable by heat. This secondary coating can be applied either over the entire area of the bag material or can be applied to restricted areas, leaving free such margins of the bag material that are to be subsequently sealed by heat and pressure; this applies to the long seam of the tube, as well as to the seams at each end of the bag. I find that by applying a thin coating of paraffin over the latex coating I can form an effective seal, by means of heat and pressure. Heat and pressure applied melts the paraffin first, paraffin having a lower melting point than latex, and thereafter a considerable portion of it oozes out through the open end or cut end, permitting the latex to combine irregularly, but retaining the joint permanently. The spaces in between the irregular fusing of the latex are filled with the remaining paraffin; thus I secure a leak-proof and air-tight joint, even though the secondary coating covers the entire area of the bag material.

A paraffin coating, however, not only eliminates the odor of latex within the bag, but acts as secondary protection in resistance to moisture-vapor-penetration. Where a great degree of protection against moisture-vapor penetration is desired, a heavy coating of paraffin can be applied to restricted areas, so as to leave free such portions that are eventually to be sealed. Considering the fact that nearly all food products require protection against moisture—some to retain the moisture possessed when packed, thus making it necessary to build a wall so that the product will not lose its moisture; other products, requiring to remain in a dry state, need protection to keep the outside moisture from entering the interior. By providing a secondary coating over the latex, I further secure a very high degree of moisture protection for the contents.

One mode of use of the bag will be to employ it with carbon-dioxide packing, which heretofore has been applied to metal containers only, so far as I am advised. In this practice the bag is opened and the empty bag filled with carbon-dioxide, which, being heavier than air, excludes the air from the bag. The contents are then placed into the bag, which displaces the carbon-dioxide and the bag is closed as heretofore described, utilizing heat and pressure. From my experience, the bag can be filled and sealed so that there is less than 10% of air therein, which provides adequately against oxidation of the contents of the package.

In Fig. 5, I have shown an alternative mode of procedure in making the bag. In this case paper 10 will be selected, which is such as to satisfy requirements for air tightness and for oil tightness. Bands 11 of latex will be formed along the margins of the sheet, and thereafter the sheet cut on the lines 12. The individual sheets will then be caused to pass through a gluing and folding machine, with the coated bands at the front and back thereof, so that a seam is formed to make a tube which corresponds to the tube

already described. The tubes may then be caused to travel at right angles to their former path, either as part of the same operation, or in another machine, and the bottom seal formed, as already described.

Instead of using rubber latex in this second mode of procedure, I can use a water-soluble adhesive as described in my former application, in which case steam or moisture, as well as heat and pressure, are used in making the seal.

I contemplate in my invention the use of lacquers of various kinds for coating the interior of the bag, or for forming the sealing band of adhesive. Such lacquers will necessarily be of heat-plastic type, and substantially impermeable when the seal has been formed. In the absence of plasticizers, the usual condensation product varnish will not serve my purpose so well as other materials, such as latex, because it is lacking in ultimate flexibility. Particularly where the entire paper sheet is coated with the material, latex will provide that elasticity where corners are likely to form which will protect against development of cracks and pin holes, and the fused seams both crosswise and lengthwise of the bags will be of latex to latex thus providing a unitary latex interior for the bag.

The bags formed according to my invention serve purposes which have heretofore not been served by any bag. The degree of impermeability of the finished and filled bag made according to my invention is of much enhanced kind over any previous bags with which I am familiar. It attains the object of removing the last chance of leakage, either of oil or greasy products from the bag, or of air or water vapor into the bag, or out of the bag, this last item of security being of essential importance, and having so far resisted efforts of manufacturers in the past. My bag, for example, has proven to be the only product on the market which will permit of use in carbon dioxide packing. It has proven to be the only bag in which oil can be shipped and held for long periods of time without any discoloration, even, of the outside of the bag.

Instead of paper as strictly interpreted, my practice is well adapted to cellulose webs such as "Cellophane", without modification, and in the claims that follow I intend to include such cellulose webs, when using the word "paper". Also, the term is used to cover thin bodies of special rubber composition used for wrapping and packing, i. e., to cover those usual materials known as paper or substitutes therefor. Naturally where such webs are used which are heat-fusible throughout, the seams when fused will be integral or unitary with the walls of the bag.

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

1. A bag for the purpose described, formed of paper having a coating on the inside at least of rubber latex, same formed into a lapped seam tube, with a flat sealed end formed by securing together opposite faces without re-entrant folds the end of said lapped seam tube, said latex serving as the sealing medium, there being a coating of paraffin or other readily meltable wax over the latex film on the interior of the bag.

2. A bag for the purpose described, formed of paper having a coating on the inside at least of rubber latex, same formed into a lapped seam tube, with a flat sealed end formed by securing together opposite faces without re-entrant folds the end of said lapped seam tube, said latex serving as the sealing medium, there being a coating of paraffin or other readily meltable wax over the latex film on the interior of the bag, said film being located also at the sealed end thereof except as eliminated by heat and pressure applied in forming said sealed end.

3. A bag for the purpose described, formed of paper having a coating on the inside at least of rubber latex, same formed into a lapped seam tube, with a flat sealed end formed by securing together opposite faces without re-entrant folds the end of said lapped seam tube, said latex serving as the sealing medium, said latex film being located also about the inside of the tube at the remaining open end for forming a like seal after the contents have been introduced, there being a film of paraffin or other readily meltable wax over the latex film on the interior of the bag.

4. A bag for the purpose described, formed of paper having a coating on the inside at least of rubber latex, same formed into a lapped seam tube, with a flat sealed end formed by securing together without re-entrant folds the opposite faces of the end of said lapped seam tube, said latex serving as the sealing medium, said latex film being located also about the inside of the tube at the remaining open end for forming a like seal after the contents have been introduced, there being a film of paraffin or other readily meltable wax over the latex film on the interior of the bag, including also the said latex as located at the remaining open end of the tube.

5. A bag for the purpose described made from paper or the like having a flexible thermoplastic coating on a surface thereof, and a secondary thermoplastic coating superposed over said first-mentioned coating, said secondary coating having a melting point lower than the melting point of the first-mentioned coating, wherein at least one seam is formed between overlapped surface portions by fusion of said primary coatings to each other through the intervening secondary coatings.

6. A bag made of a sheet of paper or the like having a flexible thermoplastic coating on at least one surface thereof, and a secondary thermoplastic coating superposed over said first-mentioned coating, said secondary coating having a melting point lower than the melting point of the first-mentioned coating, and having moisture-vapor penetration resistance, the first-noted or primary thermoplastic coating having greater tensile strength than the secondary coating, and a seam in said bag formed by the heat fusion of the primary coatings of two surfaces, one to the other, the melting point of said secondary coating being sufficiently lower than the melting point of said primary coatings to permit said heat fusion between the primary coated surfaces, and the secondary coating increasing the moisture-vapor impermeability of the bag.

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