Nov. 11, 1941. G. A. MOORE 2,262,111

CONTAINER

Filed Oct. 28, 1937

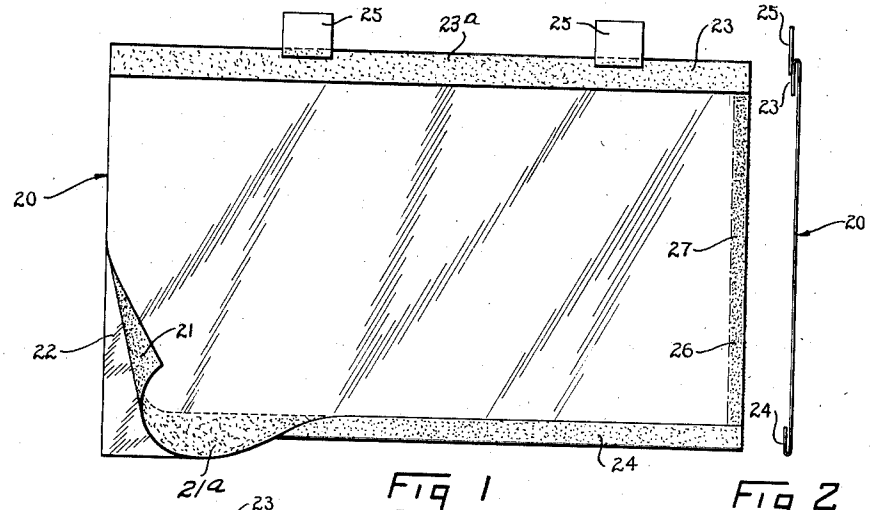


Fig 1

Fig 2

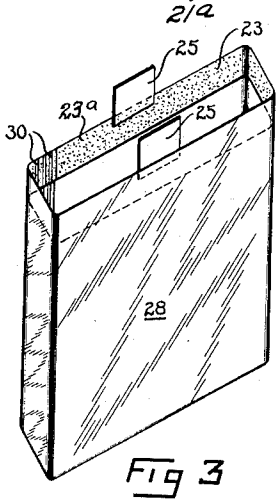


Fig 3

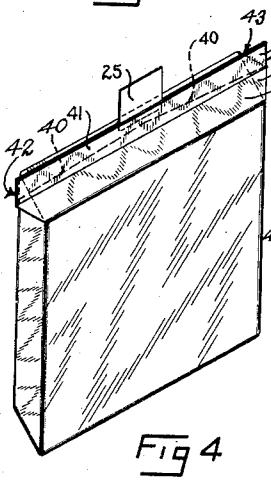


Fig 4

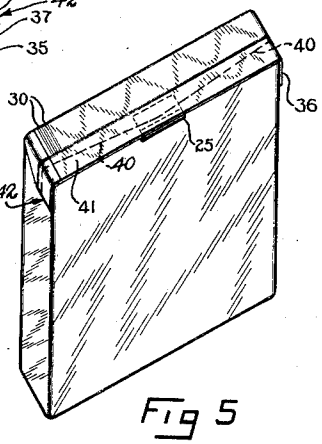


Fig 5

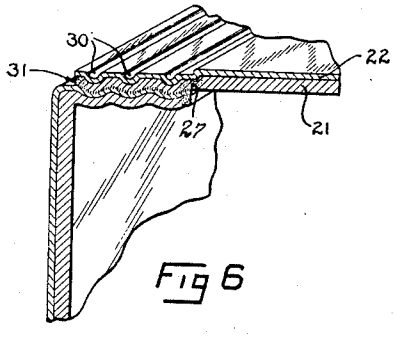


Fig 6

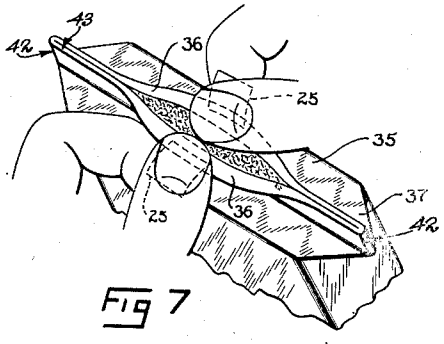


Fig 7

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UNITED STATES PATENT OFFICE

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CONTAINER

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Application October 28, 1937, Serial No. 171,444

8 Claims. (Cl. 229—55)

This invention relates to receptacles and more particularly to containers fabricated from fibrous and other flexible or foldable materials.

In my previous application Serial No. 153,705, matured into Patent No. 2,214,172, I disclosed a container of the above type made from a laminated blank comprising a layer of fibrous material and a layer of non-hygroscopic material, such as metal foil, attached thereto. In the the form shown, the container was particularly adapted for packaging tobacco or the like and was so sealed as to be substantially impervious to moisture. The blank was shown as folded into the form of an open-tubular body of rectangular cross-section with the foil layer on the outside. The top and bottom marginal portions of the blank were folded inwardly to provide a multi-ply hem about the periphery of the mouth of the body in which the fibrous material was entirely sealed within the inturned metal foil. The portions of the opposed sides of the body were folded at right-angles to form an end wall and the opposed surfaces of the hem were adhesively joined to form a metal-to-metal seal. The seal was preferably effected by heat and pressure with the use of a thermoplastic adhesive, although other sealing means could be used. A portion of the opposed hems at the edge of the body were left unsealed so as to provide flaps which could be engaged by the fingers for pulling the two sides apart and thereby breaking the seal.

While this construction was found to provide an impervious package which could readily be opened without the aid of tools and could again be closed, without re-sealing, by a simple folding operation, it was found that as applied to containers of smaller sizes and particularly to the containers of a comparatively narrow type, there was not sufficient material left unsealed to provide a suitable finger hold which would permit the fingers to readily engage the two sides of the hem for opening the same.

The present invention accordingly relates more particularly to small-sized containers of the above-described type, although it is to be understood that the construction may also be used for the larger size containers if desired, and has for an object to provide novel and improved containers of this type which may be hermetically sealed and which is provided with means which can be readily grasped by the fingers for opening the container when desired.

A further object is to provide a novel container of the above type which is sealed in such a manner that it can be readily opened without danger of tearing the material even when the container is formed of comparatively thin and fragile stock.

A still further object is to provide a novel and improved container of the above type which is hermetically sealed along the overlapped joint of the side wall.

Another object is to provide a novel container of the above type which is efficient and dependable in use and which may be readily and inexpensively constructed.

The above and further objects and novel features of the invention will more fully appear from the following detailed description when the same is taken in connection with the accompanying drawing. It is to be expressly understood, however, that the drawing is for the purpose of illustration only and is not intended as a definition of the limits of the invention, reference for this latter purpose being had primarily to the appended claims.

In the drawing, wherein like reference characters refer to like parts throughout the several views:

Fig. 1 is a side elevation of a laminated blank which may be employed in making one form of container comprehended by the present invention, a portion of the inner lamination of said blank being turned back to show the construction thereof;

Fig. 2 is an end view of said blank;

Fig. 3 is an isometric view of the container with the top open and unsealed;

Fig. 4 is a similar view showing the closure seam;

Fig. 5 is a similar view illustrating the tabs of said closure seam folded flat against the walls of the container;

Fig. 6 is an enlarged sectional view showing the construction of the side seam; and,

Fig. 7 is an isometric view illustrating how the container of the present invention may be readily opened.

A specific embodiment of the present invention is illustrated in the drawing, the same being shown by way of example in the form of a self-sustaining container suitable for use in packaging tobacco and various other products and commodities of a similar nature. In the form illustrated, the container is made from a laminated blank comprising a layer of fibrous material and a layer of non-hygroscopic material, such as metallic foil, folded and sealed in a manner to be described.

The container is shown as made from a single rectangular blank 20, Figs. 1 and 2, which may be laminated from one or more layers of paper 21 and one or more layers of non-hygroscopic sheet material, such as metallic foil sheet 22. These laminations 21 and 22 may be secured together throughout the entire area of their engaging surfaces by means of a suitable elastic adhesive which will not crack or flake when the blank is folded. The upper and lower edges of the blank 20 are folded over to form upper and lower hems 23 and 24 respectively. It will be noted that these hems are folded over with the metal foil 22 on the outside so that the paper 21 is completely covered thereby. The engaging paper surfaces of said hems may be coated with a dry, thermoplastic lacquer film 21*a* and may be secured together thereby either at this stage of the construction or at a later stage, as will subsequently appear.

A pair of tabs 25 are shown as attached to the upper hem 23. These tabs are preferably made of linen and may be coated on one side with a thermoplastic lacquer. The entire foil surface, including the portion to which these tabs are attached, may be coated with a cellulose acetate or nitro-cellulose lacquer 23*a*. The thermoplastic coating accordingly provides a firm attachment for the tabs, inasmuch as there are two prime surfaces to which attachment is made. It will be noted that the tabs extend over only a portion of the width of the hem 23, thereby leaving a substantial portion of said hem for effecting the metal-to-metal seal to be described.

To one side margin of the blank there is applied a suitable adhesive or lacquer film 26 having adhesive properties, such as a nitro-cellulose thermoplastic film, for example, Du Pont nitrocellulose lacquer No. X–660–208. A thin strip of wax 27 is deposited on the inner surface of the blank at the inner edge of the thermoplastic film 26. This wax is adapted to form a moisture-proof seal at the edge of the overlapped seam, as will be described. The general construction of this blank and the materials thereof are more fully set forth in the prior application above identified and these features are accordingly not repeated herein in detail.

The blank 20 with the infolded hems 23 and 24 may be folded to form a tubular body 28, as shown in Fig. 3, having a substantially rectangular cross-section, the overlapping ends of the blank being joined by the thermoplastic film 26, as illustrated more in detail in Fig. 6. The blank is preferably folded in this form on a mandrel having a plurality of grooves registering with similar impressions formed on a sealing tool, such as a heated iron or the like which is adapted to press a plurality of ribs 30 into the overlapped ends, at the same time applying sufficient heat and pressure to activate the thermoplastic material and to thereby effect a positive seal.

The heat thus applied also softens the wax strip 27 and thereby causes the wax to permeate the fibres of the paper so as to make the paper resistant to the microscopic flow of moisture therethrough. A further strip of wax 31 is deposited at the outer edge of the seam and is caused to permeate the exposed edge of the fibrous material 22, thereby, in conjunction with the wax strip 27, forming an effective seal for preventing the passage of any moisture to or from the container by the wicking action of the paper. The quantity of wax should be such that no undue dilution of the solids contained in the thermoplastic films takes place. The ribs 30 in the overlapped seam are effective in compacting the fibres of the paper in concentrated form and also contribute to the resistance to passage of moisture as well as strengthening the seam.

The top of the body may be closed and sealed to provide a metal-to-metal seal which is adapted to prevent the passage of air or moisture either from or into the container and the contents thereof, by folding the marginal portion at the top of the body at right-angles to the sides thereof to form top sections 35 and adjacent upstanding flanges 36, the flanges 36 constituting substantially the hem 23. In making this fold the ends of the container are folded outwardly so that flat triangular end tabs 37 are formed thereon, the flanges 36 extending along the entire length of the top of the container and over the end tabs 37.

It will be noted that the adjacent flanges 36 form a metal-to-metal contact due to the inturned metal foil portion of the hem 23. A metal-to-metal seal is effected by applying heat, by any suitable means, such as a heated die, to the opposed surfaces of the flanges 36, sufficient heat being applied to activate the thermoplastic adhesive 23*a* thereon and to effect the desired seal. This heat is applied to seal the lower portion of the engaging surfaces of flanges 36 extending from the top sections 35 to inclined lines 40 which slope from the ends 42 of the flanges upwardly toward the upper or outer edge 43 of said engaging surfaces to a point at the center thereof, thereby leaving a portion 41 of the flanges 36 above said lines 40 substantially unsealed. Lines 40 intersect at a point below the ends of the tabs 25 so that these tabs do not interfere with the metal-to-metal seal and are not themselves sealed together.

The sealed flanges 36 may then be bent downwardly against the top of the container, as shown in Fig. 5, with the end tabs 37 bent over and lying against the surface of the container ends. The tabs 25 may be tucked in below the turned-down flanges 36. Heat and pressure may be applied, if desired, to the tips of the end tabs 37 to adhesively secure the same in place against the end walls of the container.

It is to be understood that the bottom of the container is sealed in a substantially similar fashion except that the bottom flanges may be entirely sealed inasmuch as it is not necessary to leave an unsealed portion to facilitate the opening thereof. The triangular end tabs formed at the bottom may be folded down against the bottom of the container and adhesively secured thereto, as set forth more in detail in my co-pending application above mentioned.

When it is desired to use the contents of the container, the latter may be readily and cleanly opened, as shown in Fig. 7, by first removing any closure seal, such as a revenue stamp which may have been applied thereover, and then lifting the end tabs 37 from the end walls of the container. The flanges 36 are then raised to a vertical position, as shown in Fig. 4, and the tabs 25 are grasped between the fingers and used for pulling the flanges 36 apart and breaking the seal, thereby exposing the contents of the container.

It will be noted that the termination of the sealed portion of the flanges 36 at the inclined lines 40 facilitates this opening operation inasmuch as the pull from the tabs 25 is exerted diagonally, first starting to break the seal at the point directly under the tabs 25 and then causing the line of breakage to extend outwardly un-

til the entire seal is broken. It has been found that a seal of this type is readily broken in an even and progressive manner without danger of tearing the material from which the container is made. Inasmuch as the entire pull is exerted by the tabs 25, it is of course essential that these tabs be secured firmly. The thermoplastic adhesive in combination with the cellulose acetate lacquer coating on the foil itself has been found to be particularly suitable for this purpose.

It is to be understood that if the container is sufficiently large so that space is provided to permit the fingers to grasp the unsealed portions of the flanges 36, the tabs 25 may be omitted. In the smaller containers, however, such as containers for loose tobacco, the tabs 25 have been found to be desirable and to materially facilitate the ease with which the container may be opened.

It will be noted that the metal-to-metal seal at the top and bottom of the container effectively prevents passage of moisture thereto, and the seal produced by the wax strips 27 and 31 along the side seam effectively seals the latter against passage of moisture. The container is accordingly adapted to keep tobacco or the like over long periods of time without change in the moisture content thereof.

It is to be understood that the container may be made in accordance with any of the embodiments set forth in my copending application above mentioned and that only so much thereof has been set forth herein as is necessary to a complete understanding of the scope of the present invention. In order to avoid duplication, the details of construction which were fully set forth in the previous application have not been repeated herein.

By this invention, there is provided a novel, substantially impervious container which may be readily and inexpensively manufactured and packed and which may be made of light flexible materials and yet be self-sustaining and adapted to be opened without injury to the material itself. The container may be opened without the aid of tools and may be closed an indefinite number of times so that there will be no danger of loss or contamination of the contents when intermittent use of the latter is desired. The container is light of weight and sufficiently flexible to render the same convenient and comfortable to carry in the user's pocket, yet durable and highly efficient in preventing the transfer of moisture between the contents and the atmosphere.

Although a particular embodiment of the invention has been illustrated and described in detail, it is to be expressly understood that the same is not limited thereto. Various changes may be made, for example, in the particular materials and adhesives without departing from the spirit and scope of the invention, as will be readily understood by those skilled in the art. For a definition of the limits of the invention, reference is had primarily to the appended claims.

What is claimed is:

1. A container constituted by a body having a wall comprising an inner layer of fibrous material and an outer layer of foil, the marginal portion of an end of said body being infolded to form a foil-lined, reinforced hem, portions of the opposed surfaces of said hem being secured together to form a metal-to-metal closure seam, said seam terminating along oppositely inclined lines extending from points at the ends of said seam below the upper edge of said opposed surfaces to a point at the center of said opposed surfaces below said upper edge but nearer thereto than said first-named points to thereby leave the portion of said opposed surfaces adjacent said upper edge unsealed so as to provide accessible means for readily opening the container.

2. A container constituted by a body having a wall comprising an inner layer of fibrous material and an outer layer of impervious material, the marginal portion of an end of said body being infolded to form a reinforced hem lined with impervious material, portions of the opposed surfaces of said hem being pressed into engagement and joined together by a thermoplastic adhesive interposed therebetween to form an impervious closure seam, said seam terminating along oppositely inclined lines extending from points at the ends of said seam below the upper edge of said hem to a point at the center of said opposed surfaces below said upper edge but nearer thereto than said first-named points to thereby leave the portion of said opposed surfaces adjacent said edge unsealed so as to provide accessible means for readily opening the container.

3. A container constituted by a body having a wall comprising an inner layer of fibrous material and an outer layer of foil, the marginal portion of an end of said body being infolded to form a foil-lined, reinforced hem, portions of the opposed surfaces of said hem being secured together to form a metal-to-metal closure seam, the upper edge of the sealed portions terminating along lines inclined downwardly from the central portion of said hem to points at the ends of the seam below the upper edges of the opposed surfaces of said hem to thereby leave the remaining portion of said opposed surfaces unsealed, and a pair of tabs adhesively anchored to said opposed surfaces extending outwardly from the central portion of said seam and adapted to be gripped and separated for breaking the seal along said inclined lines.

4. A container constituted by a body having a wall comprising an inner layer of fibrous material and an outer layer of foil, the marginal portion of an end of said body being infolded to form a foil-lined, reinforced hem, portions of the opposed surfaces of said hem being secured together to form a metal-to-metal closure seam, said seam terminating along oppositely inclined lines extending from the points at the ends of said seam below the upper edges of said opposed surfaces to the center of said opposed surfaces and toward said edges to thereby leave the remaining portion of said opposed surfaces unsealed, and a pair of tabs secured to the inner surface of said hem above said seam adjacent the intersection of said lines, said tabs being adapted to be gripped for exerting a force to open said seam.

5. A container constituted by a body having a wall comprising an inner layer of fibrous material and an outer layer of foil, the marginal portion of an end of said body being infolded to form a foil-lined, reinforced hem, portions of the opposed surfaces of said hem being secured together to form a metal-to-metal closure seam, said seam terminating along oppositely inclined lines extending from the ends to the center of said opposed surfaces and toward the outermost edges thereof to thereby leave the portion of said opposed surfaces adjacent said edges unsealed, and a pair of tabs secured to the inner surface of said hem by a thermoplastic adhesive, said tabs terminating above said seam adjacent the

intersection of said lines and being adapted to be used for exerting force to open said seam.

6. A container constituted by a body having a wall comprising an inner layer of fibrous material and an outer layer of foil, the marginal portion of an end of said body being infolded to form a foil-lined, reinforced hem, a pair of tabs adhesively secured to said hem and extending over only a portion of the width of said hem, a portion of the opposed surfaces of said hem adjacent the interior of the container being sealed together to form a closure seam, said last portion terminating at oppositely inclined lines extending from points at the ends and below the upper edges of said opposed surfaces toward the center and said edges thereof and lying beneath the ends of said tabs whereby a pull exerted by said tabs causes a progressive break of said seam along said inclined lines.

7. A moisture-proof container formed from a blank comprising a layer of fibrous material and a layer of metal foil, said blank being folded to form a tubular body portion with the metal foil on the outside, the ends of said blank being secured together by thermoplastic adhesive to form an overlapped seam, strips of wax extending along the opposite edges of said overlapped seam and impregnating the adjacent fibres of the fibrous material to prevent passage of moisture therethrough, the portions of the blank constituting the ends of the body being folded inwardly to form foil-lined, reinforcing hems and being folded inwardly with at least portions of the opposed inner surfaces of each of said hems joined together by a thermoplastic adhesive to effect metal-to-metal seams, whereby the entire container is made impervious to moisture.

8. A blank for use in making a moisture-proof container comprising a layer of fibrous material and a layer of metal foil adhesively secured thereto, an edge of said blank being folded over to form a reinforced hem with the foil on the outside and with the fibrous material concealed thereby, and a pair of tabs adhesively secured to said hem and extending upwardly therefrom, said tabs extending over a portion only of the width of said hem so as not to interfere with a metal-to-metal seal, a film of thermoplastic adhesive adjacent a side edge of said blank and a strip of wax extending along the inner edge of said film adapted to impregnate the fibres of said fibrous material when the overlapped ends of the blank are secured by heat and pressure.

GEORGE ARLINGTON MOORE.