

Sept. 15, 1953

G. T. PFEIFER
COMBINATION PACKAGE

2,652,148

Filed Dec. 9, 1949

2 Sheets-Sheet 1

Fig-1

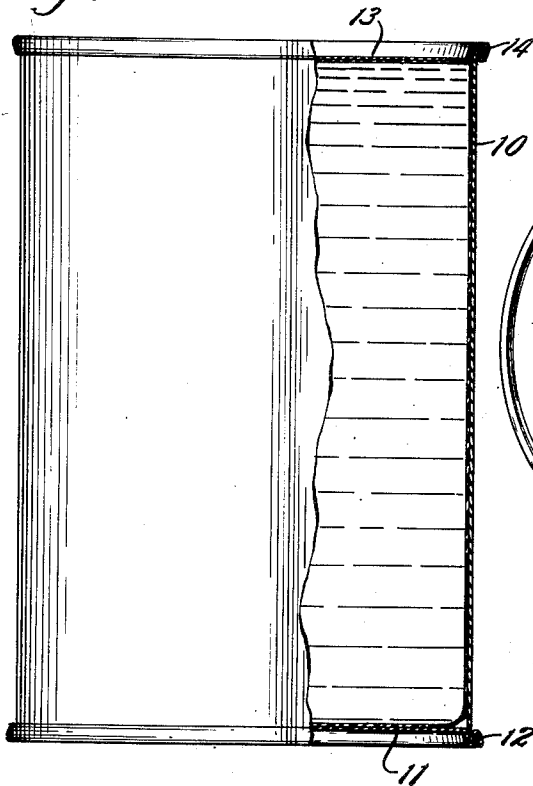


Fig-2

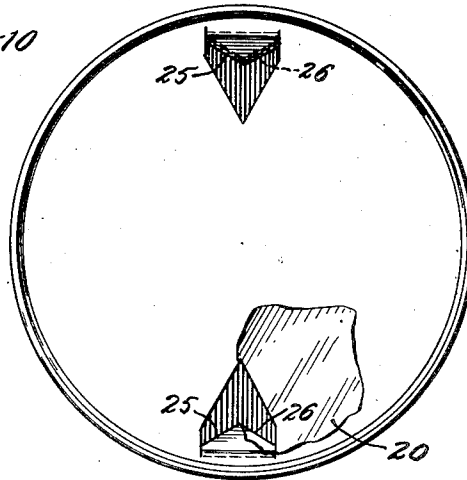
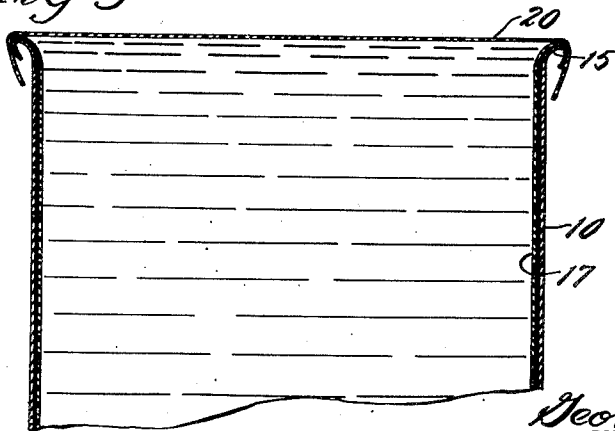


Fig-3



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2 Sheets-Sheet 2

Fig-4

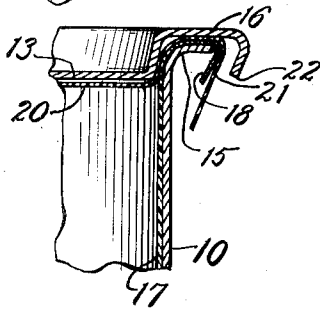


Fig-5

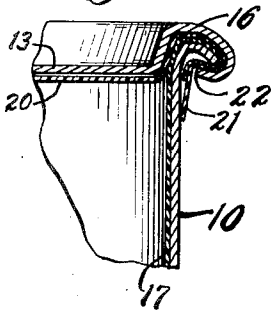


Fig-6

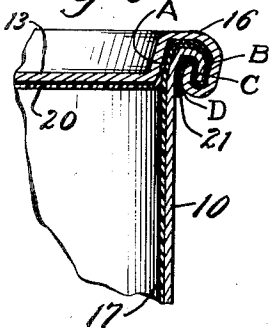
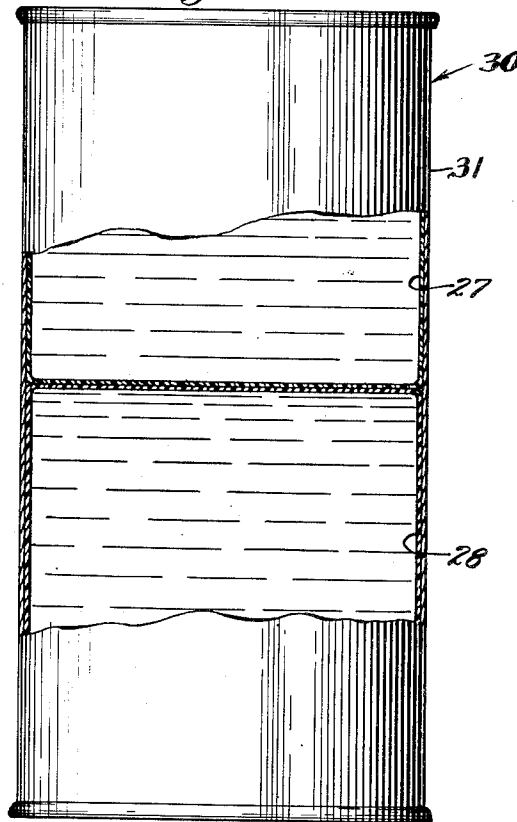


Fig-7



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UNITED STATES PATENT OFFICE

2,652,148

COMBINATION PACKAGE

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Application December 9, 1949, Serial No. 132,138

4 Claims. (Cl. 206—47)

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This invention relates, generally, to packaging in rigid containers materials which must be kept from directly contacting the interior surface of the containers, and the invention relates, particularly, to innovations and new and useful improvements which permit materials to be "canned" in containers which are conventionally known as "tin cans" using standard automatic sealing machines, with the contents being maintained out of direct contact with the interior of the tin cans by liners of suitable impermeable plastic film material.

The tin can container, and automatic machinery and techniques for packaging various materials therein, have been perfected to a very high degree in this country. Among the outstanding advantages of tin cans as containers are: (1) low cost of the cans; (2) low unit cost and the convenience of automatically filling and sealing the cans using efficient automatic machinery; and (3) the non-frangible character of the tin can and the relatively large degree of rough handling and shock which the tin can package can safely withstand.

Despite the above and other practical advantages and desirable characteristics of tin cans as containers, there were prior to this invention many materials which could not be satisfactorily packaged in tin cans. Thus, on the one hand there are many substances and materials which are corrosive with respect to the tin plate from which the tin cans are formed, while on the other hand, there are other substances and materials which cannot tolerate direct contact with the tin plate.

It is known that special enamels and lacquers have been developed for lining tin cans so as to permit packaging of materials therein (e. g. beer) which could not otherwise be packaged satisfactorily in tin cans. These special enamels or lacquers must be carefully applied, usually in several coats, and the cost of the cans is thereby increased considerably. The lacquer and enamel linings have proven to be only a partial solution to the problem of packaging materials in tin cans, which materials must for one reason or another be maintained out of direct contact with the can interior.

In view of the known resistance and tolerance of various known impermeable plastic film materials to many of the substances and materials which normally cannot be packaged in direct contact with the interior of tin cans, efforts have been made to use such plastic films as separate sack or bag type containers which are sealed by

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themselves and then packed and sealed in tin cans. This type of packaging in tin cans constitutes only a partial solution to the problem and is not completely satisfactory for several reasons.

5 Special machinery and techniques are required for first filling and sealing the plastic film bags before they are inserted in the tin cans and these are sealed. Thus, the cost of this type of package is materially increased since it actually involves two distinct and separate packaging operations. The loose, separately sealed plastic bags do not completely fill the interior of the tin can containers and the potential capacity of the tin cans is only partially utilized and the efficiency of the package is correspondingly reduced, further adding to the packaging cost. The loose bags are free to shake and move around within the sealed tin cans and since the film walls of the sacks are unsupported, rough handling of the tin can containers and the consequent tumbling or slipping around of the loose sacks causes rupturing of the sacks with resultant spoilage of those packages.

25 The tin cans containing the unanchored or loose plastic bags or sacks are awkward to handle at the time of opening. Thus, the tin can container first has to be opened by removing one of the ends so as to permit removal of the filled sack or bag therefrom. Then the sack has to be punctured or opened in some way to discharge its contents. When the material packaged is a liquid, it is difficult to empty the plastic bag without some spilling of the liquid on the hands or over the surrounding area. Furthermore, it is not practical to rinse out the bags so as to obtain all of the contents therefrom.

35 The present invention permits impermeable plastic films to be used as liners for the interior of tin cans in such a way as to eliminate the above and other difficulties and objections associated with prior methods of using plastic films to shield or isolate the contents of tin cans from the interior surfaces thereof.

45 An important object of the invention is a sealed container and package wherein the interior surface of the container is completely lined with stretchable, impermeable film or sheet which is attached to the container structure around the periphery of a sealed opening forming one of the end walls of the container.

50 An important object of the invention is a sealed container, and a package formed by the sealing of contents therewithin, which container comprises a conventional type tin can which is completely lined with a closely conforming film or

sheet of impermeable and stretchable material capable of isolating the contents from the interior surface of the can, which lining is attached to the tin can around at least one of the opposite ends of the tin can along the line of the endless sealed seam or joint between the end wall of the can and the adjacent rim thereof.

Still another important object of the invention is a sealed tin can type container and sealed package wherein the container comprises an ordinary type tin can, such as is used for canning food products, having an impermeable plastic film liner capable of shielding and isolating the contents of the can from the total interior surface thereof, the lining, in part taking the form of a sack or bag of the impermeable plastic film or sheet material, e. g., polyethylene, which is inserted into the open can so as to conform to the interior thereof with the peripheral edge of the bag opening overlying the rim or flange of the can, and the interior lining being completed by a separate piece or end piece liner of the plastic sheet or film which covers the end wall of the tin can which closes the open end thereof, with the peripheral edge of the end piece liner and the peripheral edge of the top opening of the sack or bag being crimped together into a sealed joint in the joint or seam formed between the end cover of the can and the rim thereof, the end piece of plastic film being drawn taut or stretched across the end of the can.

Still another object of the invention is the method of forming a sealed container and package wherein the interior is lined with a protective stretchable, impervious film or sheet by inserting a sack formed of such film material having desired properties into an open tin can so that the sack covers the interior thereof and the peripheral edge of the mouth opening of the sack extends over the lip or rim formed around the mouth of the can, filling the lined can with the material to be packaged therein, such as a corrosive chemical, covering the mouth of the filled can with a cover liner in the form of a separate piece of the film material large enough to at least extend over the lip or rim thereof and fit over the edge of the sack opening, and sealing or closing the tin can in conventional manner using known type sealing machinery wherein the engaging edges of the sack and the cover of plastic film material are caught and included in the seam or joint formed between the cover of the can and the rim thereof with the separate piece of film being stretched taut or tight across the inner surface of the can cover or end.

A further important object of the invention is a tin can type package containing two different materials separately packaged therein and maintained out of contact with each other and the walls and ends of the tin can by protective, stretchable, impermeable film liners, one of the packaged materials being confined in a sack, formed of the impermeable liner material, which only partly fills the tin can and the other packaged material being confined in another sack formed of impermeable liner material, which fills the remainder of the can, the package being formed by inserting one of the sacks into a can open at both ends, so that the bag opening overlaps the rim of the can at one end, whereupon the bag is filled with one of the materials, a separate piece of the liner material is laid over the end of the can and the end of the can is applied so as to crimp the film material of the sack and end liner into the double seam which is formed, whereupon the other sack or bag is inserted in

the opposite end of the can and this end is filled and closed in the same manner.

Certain other objects of the invention will, in part, be obvious and will, in part, appear hereinafter.

For a more complete understanding of the nature and scope of the invention, reference may now be had to the following detailed description thereof taken in connection with the accompanying drawings, wherein:

Fig. 1 is an elevational view, partly in vertical section of a tin can package forming one embodiment of the invention;

Fig. 2 is a top plan view, partly broken away, of the tin can package of Fig. 1 after it has been opened by a "beer can" type can opener;

Fig. 3 is a fragmentary, vertical sectional view of the top portion of a tin can having a sack or bag type liner inserted therein with its open end overlapping the rim of the can, this being the first step in forming the tin can package of Fig. 1;

Figs. 4, 5 and 6 are enlarged, fragmentary sectional views showing, respectively, the three successive steps involved in closing and sealing the tin can package shown in Fig. 1; and

Fig. 7 is an elevational view, partly broken away at the mid-portion, of a tin can package forming another embodiment of the invention containing two separately packaged materials.

In Fig. 1 the reference numeral 10 designates a conventional type tin can such as is used in canning food products using automatic conveying, filling, and sealing machines. The can 10 is formed of tin plate and it may be cylindrically or otherwise shaped. The bottom end of the can 10 is closed by an end piece 11 which is joined to the side wall or sleeve portion of the can 10 at the double seam which is indicated at 12. The top end of the can 10 is closed by a cover or end piece 13 also joined to the top rim of the can by the double seam indicated at 14. Tin cans are usually purchased in the form of the open containers or cups with accompanying caps or covers therefor.

Referring now to Figs. 3, 4 and 5, the flange or rim extending around the mouth of the open can 10 is indicated at 15, and the cover or cap 13 of known conventional type having an annular "curl" portion 16 which fits over the rim or flange 15.

The can 10 and the cap or cover 13 are of known commercial type and are illustrative of the tin cans available in this country for commercial packaging.

The first step in packaging in accordance with the present invention is to insert a sack or bag 17 formed of impermeable stretchable film, e. g. polyethylene, into the can 10 as shown in Figs. 3 and 4 so that it conforms to the side walls and bottom end of the interior thereof with the peripheral mouth edge portion 18 overlying the rim or lip 15 as shown.

After the plastic film bag or sack 17 has been inserted in place as described, either manually, or by machine, the can 10 is filled with the material to be packaged such as one of the solutions used in connection with the development of photographic films and which solution cannot be packaged satisfactorily in unlined tin cans. Automatic machines are known and available for filling the can 10 with the liquid or other material to be packaged. After being filled, the cans 10 are passed by conveyor from the automatic filling machine to an automatic sealing machine, of known commercial type. Before the filled cans 10 reach the sealing machine, a disk

or cover liner of stretchable, impervious film or sheet material 20 is placed over the mouth of the can so that the peripheral margin 21 of the liner 20 overlies the peripheral edge 18 of the mouth opening of the bag 17. The cans 10, thus filled, and covered with the cover liner 20, pass into the automatic sealing machines wherein the cover 13 is dropped in place and the curl 16 and the rim or lip 15 are first rolled together and then flattened so as to form the standard double seam type of joint.

In Fig. 5 of the drawings there is illustrated the result of the first operation in the sealing machine wherein the curl 16 on the cover 13 and the rim or flange 15 are rolled into position to be flattened. It will be seen that the peripheral edge 22 of the curl 16 is rolled so as to hook underneath the flange or lip 15 which has been downwardly curved and shaped, with the peripheral portions 13 and 21 of the liner bag 17 and the cap liner 20, respectively, being caught or gathered in between the curl portion 16 and the flange 15.

In the next operation, the partially formed seam or joint shown in Fig. 4 is flattened so as to complete the joint or connection which is commonly known as a "double seam."

In the double seam 14 formed as shown in Fig. 6, there are four places at which double thickness of the film material forming the sack 17 and the cover liner 20 are compressed together. These four places are indicated in Fig. 6 by the letters A, B, C and D.

During the formation of the double seam 14 the curl portion 16 and the lip or flange 15 are subjected to drawing and tension and the peripheral edges 18 and 21 of the impermeable film material are also placed under tension or stretch. In this way the cover liner 20 is stretched taut or tight underneath the end cover 13.

It is essential that the impermeable film material be able to withstand without tearing the stretching or deforming operation which is associated with the sealing of the cans 10 on automatic sealing machines, as described above. There are a number of plastic film materials which are available in sheet form which have the necessary amount of toughness and elasticity to withstand this stretching action and which have the other properties necessary to serve as the tin can liners. Among the materials which have been found suitable for use as the stretchable, impermeable bag type liner 17 and the cover liner 20 are: polyethylene, saran, vinylidene chloride, polystyrene, rubber, and stretchable, impregnated fabrics.

The seal formed between the peripheral edges 18 and 21 of the impermeable film liners is leak-proof and the sealed tin can 10 is, in effect, lined with a continuous, unbroken lining or envelope which is fully supported by the side and end walls of the tin can. It will be seen that the normal full capacity of the tin can is completely utilized.

The sealed tin cans or packages made in accordance with this invention may be easily and conveniently opened with a beer can or oil can type of can opener. In Fig. 2 the manner in which the sealed can 10 may be so opened is illustrated. The can opener punctures the can cap or cover 13 in two places so as to form the downwardly bent triangular portions 25 and the formation of these triangular metal portions 25 results in the simultaneously puncturing of the tightly stretched film liner 20 so as to form tri-

angular portions 26-26. The remainder of the tightly drawn membrane or cover liner 20 remains intact, as shown. The contents of the container may be emptied out of one of the openings thus formed, and rinsing liquid or water may be run into the empty can and swished around and then poured out. In other words, the lined containers handle just like standard unlined tin cans.

Certain modifications of the invention as thus far described will occur and be apparent to those skilled in the art. For example, instead of using a sack or bag of plastic material such as the sack 17, a sleeve of the plastic material may be used before the bottom end 11 of the can 10 is put on. The sleeve then would extend over the opposite ends of the cylindrical wall of the can 10 and a separate piece of film would be used to form the liner for the bottom end 11 of the can 10 in the same manner that the open end of the can is lined with the separate cover liner 20. The above described method or technique of forming the lined sealed container may also be modified in obvious ways. For example, instead of placing the cover liners 20 separately over the open ends of the filled cans 10, these disks could be first secured to the underside of the can covers by spots or lines of non-setting adhesive so as to retain each disk in the proper place without interfering with the subsequent stretching thereof during the sealing operation.

The invention lends itself to the packaging of two different materials in a single tin can. A sealed tin can package of this type is shown in Fig. 7 and indicated generally therein by the reference numeral 30. The package 30 consists of a conventional tin can 31 having the opposite ends closed with the standard double seam. The upper portion of the can 31 holds one protective film sack 27, while the lower portion of the can holds another protective film sack 28. The end walls of the can 31 are protected with liners (not shown) which are sealed with the mouth of the bags 27 and 28 in the double seams as described above in connection with Figs. 3-6.

In forming the package 30, tin cans are used which are open at both ends, a mold or plug is inserted in one end and then one of the bags 27 or 28 is inserted in place, filled and the end closed in the manner previously described. The half-filled can is then turned over, the mold removed and this end is then provided with its sack and then it is filled and closed. The bags 27 and 28 may have the same or different capacities as required. Likewise, the bags 27 and 28 may be formed of the same or different materials depending upon the requirements in each case.

By way of specific example, the package 30 is particularly suited to the packaging of photographic chemicals where two different types of solution are usually employed. Thus, the sack 27 may be filled with a rapid fixer while sack 28 is filled with a hardener, especially suited for use with the fixer. It will be seen that the double-type package, 30 thus makes it possible to give the consumer both solutions in a single package. The advantages of such a double package are very much worthwhile.

There will be instances where two materials are to be packaged and only one needs to be isolated from the interior of the tin can while the other may be packaged in direct contact with the can interior. In this case the tin can, closed at the bottom, will first be partly filled with the latter material, then the protective bag of stretch-

able, impervious film will be inserted in the free-board space and this will be filled and the can sealed and closed as described above in connection with Figs. 3-6. This modification corresponds to the package shown in Fig. 7 with one of the liner bags 27 or 28 being omitted.

Since certain further changes may be made in the foregoing containers and packages, and the method of forming and sealing the same without departing from the spirit and scope of the invention, it will be understood that all matter described above or shown in the accompanying drawings is intended to be interpreted as illustrative and not in a limiting sense.

What is claimed as new is:

1. A sealed package comprising a rigid container having a sleeve member and end wall members closing the opposite ends of said sleeve member, a sack formed of stretchable impermeable film material lining said sleeve member for a part of its length with the mouth of said sack overlying the peripheral edge of one end of said sleeve member, a liner of stretchable impermeable film material underlying the end wall member of said container closing said one end of said sleeve member with the peripheral edge of said end liner overlying said mouth of said sack, said mouth of said sack and said peripheral edge of said end liner being compressed into sealed relationship at the line of seal formed between said one end of said sleeve member and said end wall closing member therefor, said sack being filled with contents which must, and will, be maintained out of direct contact with any portion of the interior of said rigid container, and the portion of the interior of said rigid container not occupied by said sack being filled with contents which can be maintained in direct contact with the interior thereof.

2. The sealed package called for in claim 1 wherein said rigid container is a conventional tin can having the opposite end wall members sealed to the can sleeve by standard double seam joints.

3. A combination sealed package comprising a rigid container having a sleeve member and end wall members closing the opposite ends of said sleeve member, a first sack formed of a stretchable impermeable film material lining said sleeve member for a part of its length with the margin of the mouth of said first sack overlying the peripheral edge of one end of said sleeve member,

a liner of stretchable film material lining the end wall member of said container closing said one end of said sleeve member with the marginal edge of said end wall liner overlying said margin of the mouth of said first sack, said marginal portions of said first sack and of said end wall liner being compressed into sealed relationship at the line of seal formed between said one end of said sleeve member and said end wall closing member therefor, a second sack formed of a stretchable impermeable film material lining the portion of said sleeve member not lined by said first sack member and having its bottom abutting the bottom of the first sack, the margin of the mouth of said second sack underlying the peripheral edge of the other end of said sleeve member, a liner of stretchable film material lining the end wall member of said container closing said other end of said sleeve member with the marginal edge of said second end wall liner underlying said margin of the mouth of said second sack, said marginal portions of said second sack and of said second end wall liner being compressed into sealed relationship at the line of seal formed between said other end of said sleeve member and said end wall closing member therefor, said first and second sacks being filled with two different materials having an associated use and both materials being of a nature which must be maintained out of direct contact with the interior of said rigid container.

4. The combination sealed package called for in claim 3 wherein said rigid container is a conventional tin can having the opposite end wall members sealed to the can sleeve by standard double seam joints.

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