Nov. 28, 1950 G. C. HOOK 2,532,166

ATTACHMENT OF KEY OPENER TO CAN ENDS
OR LIKE CONTAINER PARTS
Filed March 11, 1946

FIG. 1.

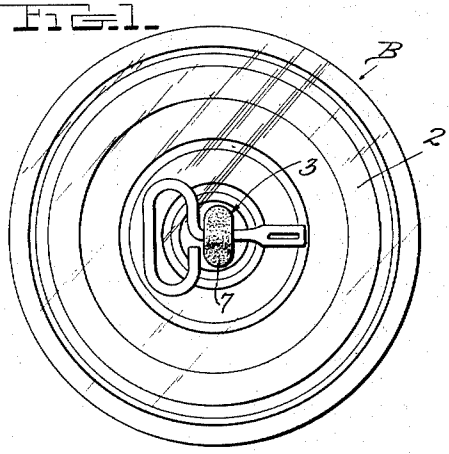


FIG. 4.

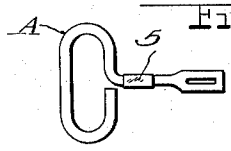


FIG. 5.

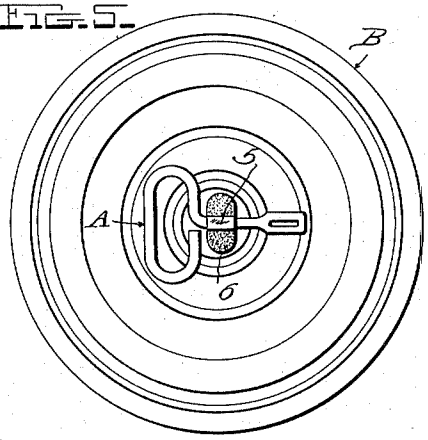


FIG. 2.

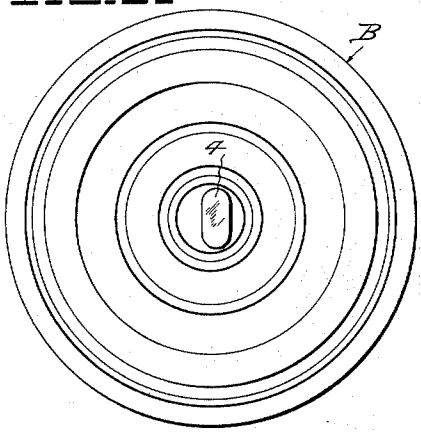


FIG. 6.

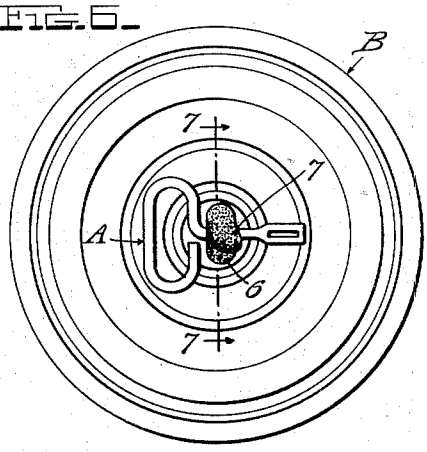


FIG. 3.

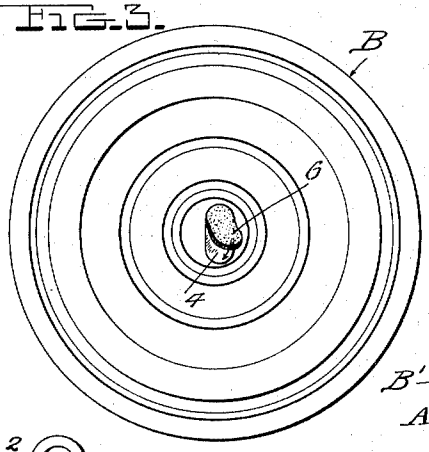


FIG. 8.

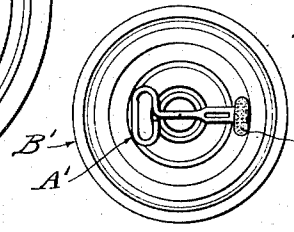
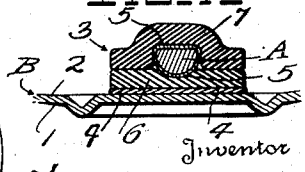


FIG. 7.



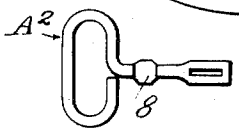


FIG. 9.

Inventor
G. C. Hook

By Mason, Portie & Hille
Attorney

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ATTACHMENT OF KEY OPENER TO CAN ENDS OR LIKE CONTAINER PARTS

George C. Hook, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N. Y., a corporation of New York

Application March 11, 1946, Serial No. 653,568

8 Claims. (Cl. 220—52)

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This invention relates to a can end or like container part with attached key opener and to methods of attaching key openers to can ends or like container parts.

It is common practice to detachably connect a key opener to a can of the kind equipped with a tear strip which may be removed from the can by being wound up on the key opener. Usually the key opener is welded or soldered to the can end and is formed with a reduced section or otherwise weakened portion for facilitating detaching of the key opener from the container. The key opener is detached from the can end by being bent and broken at the weakened portion.

The desirable structure has the opener fitted tightly against the can part with minimum projection from the surface of the part, whereby to avoid accidental contact and separation; and has an extensive portion of the opener free of attachment over the area of such portion, so that such portion may be grasped by the fingers, or pried away by a tool introduced between the opener and can, in preparation for exerting force upon the opener to detach it from the can. That is, the actual adhesion or attachment spot should be of limited but defined area, and located at a predetermined part of the opener.

A disadvantage resulting from soldering or welding a key opener to a can is that the movement of parts and the high temperature employed during attaching, particularly when attachment is effected by welding, frequently fractures or otherwise damages the lacquer coatings with which many cans are provided. For example, when a can end has an inside baked lacquer coating for protection relative to the intended package contents, this coating may require rupture before the welding current may flow at the point of contact of the opener and can end, so that the intended protection is lost at these contact points: and in addition the heat of welding may be conducted through the thin metal and cause scorching of this lacquer coating.

When metal-adherent resins such as phenol-formaldehyde condensates are employed as fused masses, the fusion temperature is so high that damage such as fracturing is likewise caused to the can lacquer. A further difficulty resides in the rigidity of adhesive resin masses which have adequate securing strength. It is necessary that the mass be frangible, for permitting the separation: but accidental blows also over-strain the rigid mass and cause premature detachment. When such resins are employed in solution as an adhesive, difficulties arise in obtaining adhesion

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spots between the opener and the container part capable of resisting the usual accidental mechanical strains and yet having a satisfactory low maximum total adhesion in order that the opener can be easily separated when so desired. Thin resin solutions cannot be applied, on a feasible commercial basis, over limited and defined areas of the contacting container part and opener, and then dried by evaporating the solvent, without extensive equipment for holding the parts and restricting the movement of the solution: thus, if the opener is bonded for its entire area, by capillary movement or simple flow, there remains no part for grasping incident to intended removal; while if a part of the opener is preserved from such bonding by being bent out of position closely adjacent the can part, it is exposed to accidental contact and premature separation and loss.

An object of the invention is to provide an improved method for attaching key openers to containers.

Another object of the invention is to provide a method for attaching key openers to container parts, e. g. can ends, in which the attaching is accomplished by effecting the adherence to both the container part and the key opener of a substance which is capable of being caused to adhere to a lacquer coating at a temperature lower than the temperature which would injure the lacquer coating.

Another object of the invention is to provide a method for attaching key openers to such container parts by causing a body of non-metallic and elastic substance to adhere to the container part and by causing the non-metallic substance to adhere to or to surround a portion of the key opener.

Another object of the invention is to provide a new article of manufacture comprising a container part such as a can end and a key opener attached to the container part by a simple, inexpensive and improved connecting means.

Other objects of the invention will become apparent from a reading of the following description, the appended claims, and the accompanying drawing.

In the drawings:

Figure 1 is a plan view of a can end and a key opener attached thereto in accordance with the invention;

Figure 2 is a plan view of a can end as it appears at an intermediate stage of the method, more specifically after applying a bonding or adhesive coat to the can end;

Figure 3 is a view similar to Figure 2 but showing the can end at a subsequent stage of the method, during the application to the can end of attaching substance to which the key opener is to be connected, as by being embedded therein;

Figure 4 is a plan view of a key opener to which a bonding coat has been applied preparatory to attaching the opener to the can end;

Figure 5 is a plan view of the can end at a still later stage, and showing the key opener laid in contact with the attaching substance;

Figure 6 is a plan view illustrating the step of embedding the key opener in the attaching substance;

Figure 7 is a transverse section through the completed connection between the can end and the key opener, the section being taken on the line 7—7 of Figure 6;

Figure 8 is a plan view of a modification in which the key opener is attached at its extreme end portion to a can end; and

Figure 9 is a plan view of a modified form of key having a portion of reduced section adapted to be embedded in material by which it is connected to a can end.

Methods in accordance with the invention may be used for attaching key openers to various container parts. For the purpose of illustration a preferred method of practicing the invention will be described as being used for attaching a key opener A to a metallic can end B which is lacquered or enameled on its inner and outer surfaces 1 and 2.

Generally stated, in carrying out the method a body 3 is caused to adhere to the surface 2 and a portion of the key opener A is connected to or is embedded in the body 3. Thus, the body 3 preferably comprises a first substance having such characteristics as to be capable of being caused to adhere to the lacquer coating on the surface 2 at a temperature lower than the temperature which would fracture or damage the lacquer coating; and also comprises a second substance capable of being affixed to the first substance at a likewise low temperature.

In a preferred way of practicing the method, a small area of the can end surface 2 first is coated as shown in Figures 2 and 7 to provide a thin bonding film 4 by use of a suitable adhesive solution of plasticized rubber hydrochloride. A bonding coating or film of similar adhesive material is preferably applied also to a portion of the key opener, for example as a band 5 on a part of the key opener shank as shown in Figures 4 and 7.

When the adhesive coating or film 4 on the can end B has reached a predetermined tackiness by evaporation of the solvent, a thin layer 6 of a potentially elastic composition comprising rubber (natural or artificial) or rubber latex and containing sulfur, fillers, vulcanization accelerators, oxidation inhibitors or other proper compounding ingredients by which the composition may be cured to its final elastically flexible state, is superimposed on the coat or film 4. The key A, with its coat or film 5 also in a suitably tacky state, is then laid in contact with the layer 6 as shown in Figure 5. An additional layer 7 of material, which may be like that composing the layer 6, is then applied over the layer 6 and the film 5 on the key opener as shown in Figure 6, and is pressed down so as to unite therewith and form a band of rubber or the like material and thus constituting the body 3 which may be about

one thirty-second of an inch to one sixteenth of an inch thick around the opener.

Finally, the material comprising the body 3 is cured by vulcanizing at a temperature lower than the temperature at which the lacquer or enamel coatings would be damaged. Baking at a temperature of 225° F. for about ten minutes or at 350° F. for about three minutes is sufficient.

Strips of uncured rubber tire tread stock may be used instead of the rubber or rubber latex composition referred to above.

The bringing of the coats or films 4 and 5 to the desired tacky condition may be accelerated by forced evaporation.

In using the method for attaching a key opener A′ to a can and B′ as shown in Figune 8, the procedure followed is the same as that described above with the exception that the body 3′ of attaching material is applied over an extreme end portion of the key opener rather than over an intermediate shank portion.

The shank of the key opener A^2 shown in Figure 9 has a portion 8 of reduced section of limited length for receiving a film of adhesive corresponding to the film 5 shown in Figure 4, being formed by crushing the shank to flatten it and thus afford space for the upper portion of the body 3 without requiring it to extend for its entire thickness above the opener.

The article or assembly disclosed herein comprises the metallic can end B having the continuous undamaged lacquer or enamel coating on the surface 2 to which the key opener is attached. The connecting body 3 has the characteristics of an elastically flexible rubber composition and is bonded strongly to the can end or the lacquer coating thereon, whereby the key opener is firmly connected to the can end so as not to be apt to become detached accidentally, but has a limited movement as permitted by the elastic nature of the attaching composition and hence absorbs blows which would be capable of breaking a connection formed by non-yielding or brittle material. The connecting body 3 also permits elastically lifting a part of the opener to obtain a grip thereon to break the connection, when separation is intended.

Figure 1 is shaded to indicate a lacquer coating on the surface 2 of the can end B. Although an additional advantage is obtained when a key opener is attached to a lacquered container part in the manner described above, it will be apparent that the invention may advantageously be made use of in attaching key openers to unlacquered or to so-called plain container parts. Figure 1 only is shaded to indicate a lacquer coating.

The method and article disclosed by way of example are preferred but it will be understood that changes may be made without departing from the invention as defined in the claims.

I claim:

1. An article of manufacture comprising a metallic container part, an opener, and a composite structure elastically securing said opener to said container part; said composite structure comprising a film of plasticized rubber hydrochloride in adherent relation to the container part, and an elastically flexible body of rubber composition adherent to the said film and having a loop surrounding a part of the opener whereby to permit elastic movement of the opener relative to the container part.

2. An article of manufacture comprising a container part, an opener, and a composite structure elastically securing said opener to said con-

tainer part; said composite structure comprising films of plasticized rubber hydrochloride in individual adherent relation to the key opener and container part, and a body having a cross-section smaller than the area of the opener and formed of cured elastically flexible rubber composition adherent to both said films whereby to permit elastic movement of the opener relative to the container part.

3. An article of manufacture comprising a container part, an opener, and a composite structure securing said opener to said container part; said composite structure comprising films of plasticized rubber hydrochloride in individual adherent relation to the opener and container part, and a body having a cross section smaller than the area of the opener and formed of elastically flexible rubber composition adherent to both said films, said body including a loop of the flexible composition extending around a part of the opener.

4. The method of flexibly and elastically attaching an opener to a container part, which comprises applying a bonding film of plasticized rubber hydrochloride to said part, applying a body of curable potentially-elastic rubber composition to said bonding film and imbedding a portion of said opener in said body, and curing the rubber composition, said body in cured condition providing a flexible and elastic connection permitting relative elastic movement of the opener relative to the container part.

5. The method of flexibly and elastically attaching an opener to a container part, which comprises applying a bonding film of plasticized rubber hydrochloride to said part, applying a bonding film of plasticized rubber hydrochloride to a portion of said opener, and then effecting connection of said films by an interposed body of rubber composition adherent to both said films, said body being upon completion of the connection of elastically flexible behavior, said body in cured condition providing a flexible and elastic connection permitting relative elastic movement of the opener relative to the container part.

6. The method of flexibly and elastically attaching an opener to a container part, which comprises applying a bonding film of plasticized rubber hydrochloride solution to the said part, evaporating the solvent therefrom until the bonding film is tacky, effecting adherence to the tacky bonding film of a mass of curable potentially-elastic rubber composition, the opener having a part of its structure surrounded by said mass, and then curing the rubber composition while detaining the key opener in such surrounded condition, said body in cured condition providing a flexible and elastic connection permitting relative elastic movement of the opener relative to the container part.

7. In a method of flexibly and elastically attaching a key opener to a container part, the steps of applying a bonding coat to said part, effecting adherence of a first layer of curable potentially-elastic substance comprising rubber to said coat, applying a bonding coat to a portion of said key opener in contact with said layer of substance, placing an additional layer of said substance over the bonding coated portion of said key opener and in adherent contact with said first layer, and treating said layers to cure them as a single body of elastic material bonded to said container part and in which said bonding coated portion of said key opener is embedded with permissive elastic movement relative to said container part.

8. In a method of flexibly and elastically attaching a key opener to a metallic container part which is coated with lacquer susceptible to being damaged by application of heat at a temperature substantially above 350 degrees F., the steps of effecting adherence of films of plasticized rubber hydrochloride to the lacquer coating and to said key opener, placing a body of curable potentially-elastic rubber composition in adherent contact with both said films, and curing said body by the application of heat at a temperature not substantially above 350 degrees F., and thereby causing said body to become a flexible and elastic connection between the key opener and the container part for permitting elastic relative movement thereof.

GEORGE C. HOOK.

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