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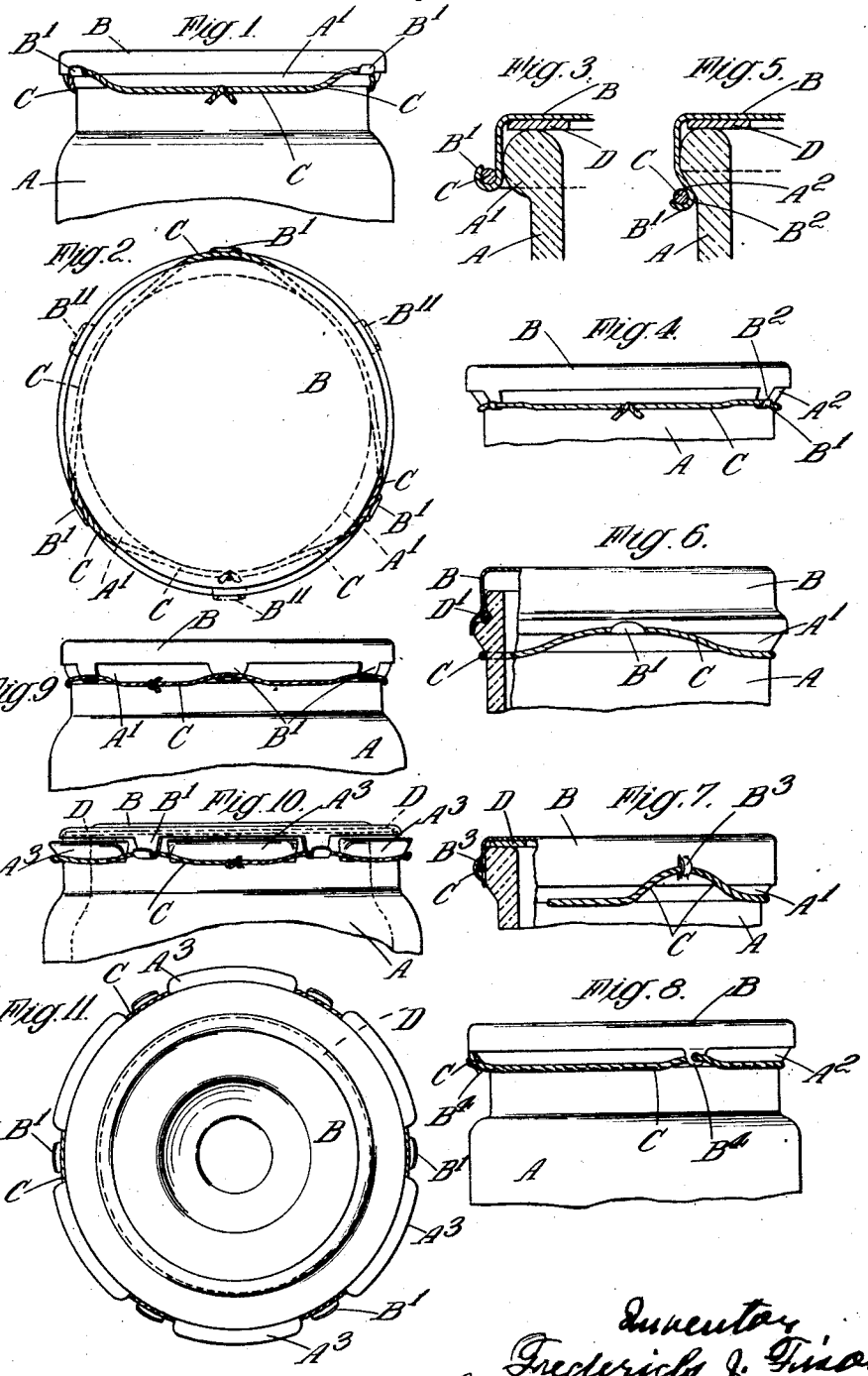

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CLOSURE FOR BOTTLES, JARS, AND OTHER RECEPTACLES.

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This invention relates to closures for jars, bottles and similar receptacles, and has particular reference to closures which comprise a closing cap or cover of metal or other rigid or semi-rigid material which is used in conjunction with a rubber or other gasket or packing ring. Such caps and gaskets are often retained in the sealed or closed position by atmospheric pressure due to air being exhausted from the jar, bottle or the like by a vacuumizing process and one of the objects of the present invention is to provide for additional security in an improved and simple manner so that in the event of the vacuum within the jar, bottle or the like (hereinafter referred to as the jar) being destroyed, the cap can be retained thereon in order to maintain an efficient closure. The invention however can be utilized for effecting a closure in cases where a vacuum seal is not provided or required.

In effecting the closure according to this invention, a length of string or other material such as thin wire, having the same or substantially same degree of flexibility as string is passed alternately under a shoulder or the like around the upper part or neck of the jar and over widely spaced peripheral retaining means on the closing cap or cover, which retaining means are so positioned in relation to the jar shoulder, that by pulling the string tightly around the jar and tying or securing its ends it is held in substantial circumferential contact with the jar under the shoulder and exerts a downward pull on the cap retaining means with the result that the cap is retained on the jar independently of the vacuum seal if such be employed. The retaining means on the cap are in the form of hook-like tabs or projections, or holes, eyes or loops or the like preferably provided on a peripheral skirt or flange on the cap and they are sufficiently spaced apart and disposed above the under surface or lower part of the jar shoulder when the cap is placed on the jar, for enabling the securing string when engaging the said tabs or the like to be tied in circumferential contact wth the jar under the shoulder and to exert the downward pull on the said tabs or the like. The jar shoulder or the like may be of any suitable or usual shape provided it is sufficiently pronounced to enable the string or similar flexible material to be held or retained thereby when tensioned and tied around the jar. The retaining means when in the form of tabs depending from the cap may be such as to pass over the maximum diameter of the jar shoulder and grip under the shoulder owing to slight deformation of the cap when being placed on the jar, so that this form of the cap can be used as a re-seal or re-closure cap for effecting a satisfactory closure without using the securing string, after the initial removal of the cap. The tabs however are located above the position where the securing string makes circumferential contact with the jar under the shoulder so as to enable the pulling down action on the tabs and the cap to be effected by tightly drawing the string around the jar. Although in some instances the tabs may be drawn inwardly against the shoulder by the securing string, the inward pressure exerted on the tabs by the string being drawn tightly around the jar is not relied upon to effect the closure as according to the present invention; the tabs or other retaining means are so positioned in relation to the shoulder that the pulling down action produced by the string when tightly held in substantial circumferential contact with the jar under the shoulder, effects the closure.

Instead of a continuous shoulder on the jar an interrupted shoulder may be used, in which case the retaining means on the cap are located in or adjacent to the spaces between the shoulder portions so that the string can be tied or tensioned in circumferential contact with the jar under the aforesaid spaced shoulder portions for enabling it to exert the downward pull on the retaining means on the cap. The fact that ordinary thin string or very flexible wire can be employed is an important advantage of the present invention as it avoids the use of shaped wire clips or bands adapted to be clamped or secured around the jar with parts thereof bearing on the upper part of the cap, and against the under surface of a shoulder on the jar. In the present invention the string is merely passed in a circumferential direction alternately over the cap retaining means and under the shoulder, against which the string is securely held in substantial circumferential contact when the ends of the string are tied or secured together to effect the closure, without passing the string over or across the top of the cap.

In order that the invention may be clearly understood and readily carried into effect the same will now be described more fully with reference to the accompanying drawings, in which:—

Figure 1 illustrates a jar having one form of closing cap provided with hook-like projections, and retained on the jar by a securing string according to this invention.

Figure 2 is a plan view of Figure 1.

Figure 3 is an enlarged fragmentary sectional view taken through the upper part or neck of the jar and a portion of the applied cap.

Figure 4 illustrates another form of cap applied to and retained on the neck of a jar.

Figure 5 is an enlarged fragmentary sectional view of the modification illustrated in Figure 4.

Figure 6 illustrates the invention applied to another form of cap fitted to a jar neck of a different shape from that shown in Figure 1.

Figure 7 is an elevation, partly in section, showing one form of the cap having eyes or loops formed thereon instead of hook-like projections.

Figure 8 illustrates a cap similar to that shown in Figure 4 but provided with perforated retaining tabs instead of hook-like projections.

Figure 9 illustrates a cap having a larger number of retaining means than are shown on any of the caps illustrated in the preceding figures.

Figures 10 and 11 are respectively a side view and a plan of one example in which the jar neck is provided with an interrupted beading or shoulder to form a series of projections for co-operating with the retaining means on the cap.

In the various examples illustrated, A represents a jar having a beading or shoulder A′ around its neck. B indicates the closing cap which as shown in the various figures is in the form of a disc having a peripheral skirt or depending flange. C represents the securing string.

In the example shown in Figure 1, the cap B is formed with integral projections B′ of hook-like formation extending outwardly from the skirt portion of the cap. As shown in Figure 2, three of these hook-like projections B′ are equidistantly positioned around the skirt of the cap and are disposed a short distance above the lower part of shoulder A′ on the jar neck. When the cap is applied to the jar the string C may be passed alternately over or within the hook-like tabs B′ and under the shoulder A′ where it makes substantial circumferential contact with the jar so that by pulling the string tightly around the jar neck when positioned as aforesaid and tying its ends a downward pull is exerted on the tabs and on the cap, with the result that the cap is retained on the jar with the interposed flat gasket (see Figure 3) securely held in position. This method of securing the cap and gasket, if used in the case of a jar on which the cap is sealed by a vacuumizing process as aforesaid, enables the cap to be firmly retained in the closed or sealed position if for any reason the vacuum within the jar should be destroyed. The securing of the cap by means of the string may be effected either before or after the jar is subjected to the vacuumizing process.

In the example shown in Figure 4 the tab portions B^2 which depend from the cap skirt, are of hook-like form at their lower ends as shown at B′ and they are made long enough to pass over or beyond the maximum diameter of the shoulder A′. When the cap is fitted on the jar neck it is slightly deformed to allow the hook-like tabs to pass over and grip under the shoulder A′ which may be shaped as shown in Figure 1 or may be of more or less conical formation as indicated at A^2 in Figures 4 and 5. The hook ends B′ however are disposed above the lower part of the shoulder where the string C is held in circumferential contact with the jar. The string C after being passed over the depending hook-like tabs B′ and circumferentially under the conical shoulder A^2 is tied tightly around the jar neck so that it is retained or held by the shoulder and exerts a downward pull on the tabs thus securing the cap as aforesaid. The tensioning of the string may also cause the depending tabs to be pulled inwardly in addition to being pulled downwardly and although this may assist in retaining the cap in the closed position it is not relied upon for effecting the closure which as previously stated is effected by the pulling down action. Any form of the cap wherein the tabs engage with or grip under the jar shoulder may be used as a reseal or reclosure cover after initially removing the cover. The rounded ends of the tabs formed by the hook-like shape enables the tabs to pass easily over the shoulder A′ when the cap is being applied to the jar.

The modification shown in Figure 6 comprises a somewhat different form of cap and jar neck, the latter being so shaped as to enable a gasket or packing ring D′ of circular section to be engaged by a shoulder like portion on the skirt of the cap B as shown in section in this figure. The hook-like projections B′ are similar to those shown in Figure 1, and the string or the like C is passed alternately over the hook-like projections and under the shoulder A′ on the jar and tied as aforesaid in order to exert the downward pull on the cap. Depending hook-like projections such as shown in Figure 4 may however be provided on the cap shown in

Figure 6 for engaging with or gripping under the jar shoulder.

In the construction shown in Figure 7, the cap B has small portions B^3 pressed out of its skirt or depending flange so that they form eyes, or loops through which the securing string C can be threaded so as to be passed alternately through the said eyes or loops and under the shoulder A′ and then tied around the jar neck for effecting the closure or affording additional security in the case of a vacuum sealed closure as aforesaid.

Figure 8 illustrates a form of cap wherein depending tabs B^4 that are adapted to be pressed inwardly against the shoulder A^2 are each formed with a hole, so that the securing string C may be threaded through the said holes and passed under the shoulder A^2 on the jar and then tied tightly around the jar neck as aforesaid. The hook-like projections B′ shown in Figures 1 to 6 and the eye portions B^3 shown in Figure 7, may be pressed or closed tightly on to the string after the latter has been tied as aforesaid so that they lie as flat or close as possible against the jar or the skirt of the cap. In some cases additional hook-like projections, eyes, loops or the like may be provided on the cap and an independent securing string may be provided for engaging the additional projections, eyes or loops. An example of such an arrangement is shown in Figure 2 wherein the additional hook-like projections B″ are shown in dotted lines, each being spaced midway between two of the hook-like projections B′. The securing string for the additional hook-like projections which is not illustrated engages with these additional projections and with the shoulder A′ on the jar in the manner aforesaid.

Any desired number of retaining means may be provided on the cap for use with a single securing string so long as there is sufficient space between them to enable the string to be retained under the shoulder when tied around the jar neck in engagement with the retaining means. Most of the caps illustrated have the retaining means at three equi-distant points around the cap but Figure 9 shows a cap B having six hook-like projections B′ equi-distantly positioned around the cap and engaged by a single securing string passing under the beading or shoulder A′ on the jar neck to retain the cap by the pulling down action on the tabs when the string is drawn tightly around the jar and tied at its ends. Instead of employing a continuous beading or shoulder such as A′ in the foregoing examples an interrupted beading or shoulder may be provided as shown in Figures 10 and 11 so as to form a series of spaced projections A^3 around the jar neck a short distance below the upper edge of the jar. In this example the cap B is provided with depending hook-like projections B′ extending from a short skirt or flange on the cap; these hook-like projections are adapted to be placed between the projections A^3 and a securing string C is passed alternately over the hook-like projections B′ and under the projections A^3 on the jar neck. By tying the string tightly the cap can be securely retained against a gasket D interposed between the cap and the upper edge of the jar as indicated by the dotted lines in Figure 10. Other forms of retaining means on the cap may be used in conjunction with a series of projections such as A^3 on the jar neck but it may be preferred to employ retaining means that actually fit between the projections A^3 as they serve to prevent angular displacement of the cap relatively to the jar which in some instances might be an advantage. In some cases the retaining means may be formed on or may extend from the disc portion of the cap instead of being formed on or extending from a skirt or flange portion on the cap.

If desired the hook-like projections or the eyes, loops, holes or the like with which the string or tying material engages may be provided on or in a part which is separate from the cap but which can be placed or secured upon or around the cap for enabling a closure to be effected by tying the string or the like around the jar neck after being placed in engagement with the hook-like projections, the holes, eyes, loops or the like as aforesaid. Any of the examples hereinbefore referred to may be used as the additional securing means for vacuum sealed jars or as the sole securing means for jars which are not vacuum sealed.

What I claim and desire to secure by Letters Patent in the United States is:—

1. The method of securing a cover to a receptacle which comprises passing a flexible binder about the receptacle in positive engagement with means on the cover at a plurality of circumferentially spaced positions and in engagement with means on the body of the receptacle at positions in a plane below the plane of the engagement of the binder and cover, which positively prevent upward movement of the binder, exerting a pull on the binder in the direction of the length thereof, whereby the cover is positively drawn downward onto the receptacle, and securing the ends of the binder to retain the cover in closed position.

2. The combination with a receptacle having a shoulder adjacent its upper end, of a cover for said receptacle provided with a plurality of spaced retaining means positioned in a plane above the lower edge of the shoulder on the receptacle when the cover is in operative position, and a flexible binder passing alternately under the shoulder and over the retaining means on the cover to exert a pull on said retaining means to force

the cover downward on the receptacle when the ends of the binder are secured together.

3. A closure for a receptacle of the character referred to, having an exterior shoulder or projection, comprising a cap or cover provided at a plurality of points about its margin with means adapted to be engaged by a flexible binder, said points of engagement being above the plane of engagement between said binder and shoulder on the receptacle when the closure is secured thereto by the binder.

4. A closure for a receptacle of the character referred to, having an annular exterior shoulder relatively near its upper open end or mouth, comprising a cap or cover having a marginal skirt provided at a plurality of points with means adapted to engage a flexible binder, the binder engaging elements of the cap being adapted to extend below the maximum diameter of the shoulder but be above the plane of engagement of the binder with the shoulder when the cap is secured to the receptacle by the binder.

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