April 22, 1969 E. M. BOBULA ET AL 3,439,949

CONTAINER ASSEMBLY AND CLAMPING RING THEREFOR

Filed Nov. 22, 1967 Sheet 1 of 2

FIG. 1

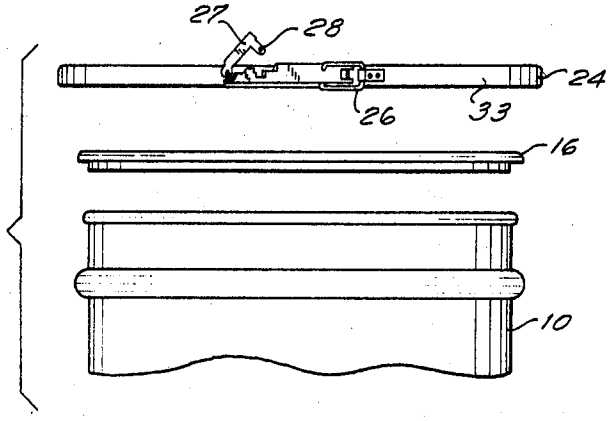
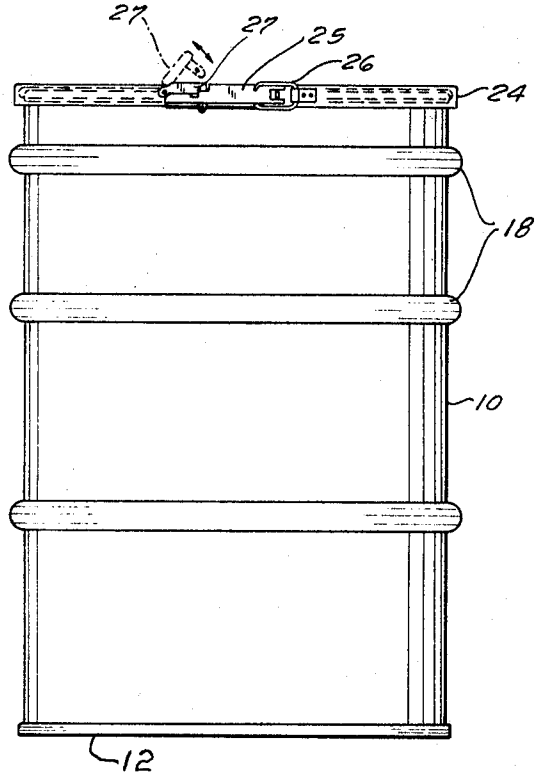


FIG. 2



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FIG. 3

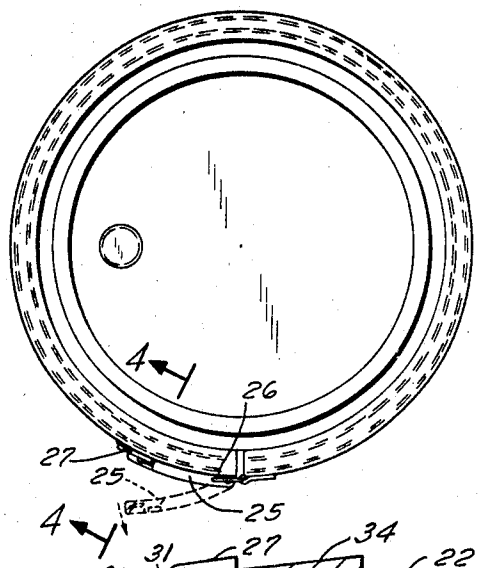
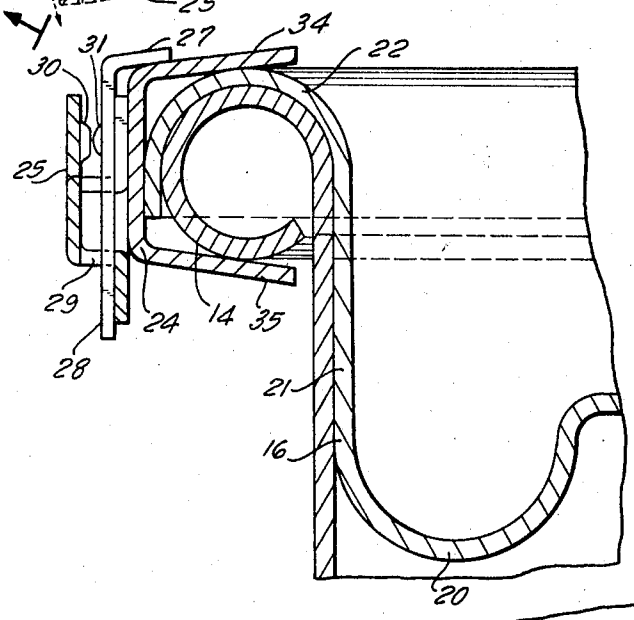


FIG. 4



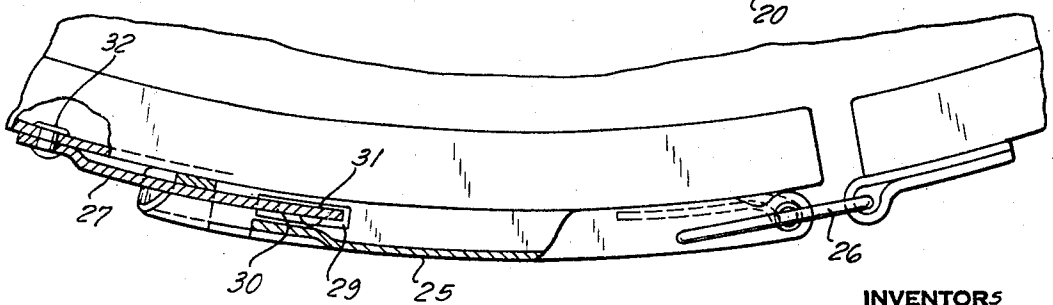


FIG. 5

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3,439,949

CONTAINER ASSEMBLY AND CLAMPING RING THEREFOR

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Int. Cl. B65d 45/34, 45/30
U.S. Cl. 292—256.69 6 Claims

ABSTRACT OF THE DISCLOSURE

A drum type container assembly including a container body with a chime on its open end, a cover for the container with a peripheral flange that combines with the chime to form cam surfaces and a split clamping ring to engage with the cam surfaces and lock the container and cover together. The clamping ring has a locking assembly to close the ring tightly after it has been loosely positioned on the cam surfaces. The locking assembly includes a latch which may be pivoted from a closed position in which it will prevent the locking assembly from being operated and an open position where the locking assembly may be operated to loosen the clamping ring. The latch is mounted so that it will tend to move downwardly due to gravitational force when it is in the closed position and is pivoted upwardly to open thereby not interfering with any portion of the container assembly below the clamping ring.

Background of the invention

The clamping ring of this invention is concerned with an improvement over the clamping ring and container assembly which is well known in the art and the advantages of which are clearly pointed out in Patent No. 3,339,962, issued on Sept. 5, 1967.

The particular improvement is directed toward the latch mechanism which is used to maintain the clamping ring in a closed position so that it may not be accidentially opened due to rough handling. Naturally, should the clamping ring become disengaged during shipment or handling the cover could come offi the container and the contents of the container could be lost or otherwise affected. Therefore, it is advantageous in many instances to have a latch which would tend or be biased in a positive seating position when the clamping ring is properly positioned on the container.

Furthermore, often when the latching mechanism is released and moved to its open position, it is restricted in movement due to the proximity of parts of the container, in particular, the rolling rings which are often positioned on the outer surface of the container. So, it would be advantageous to have a latch which opens in the direction away from all parts of the container assembly; and at its terminal open position it will not interfere with any other parts of the container assembly during loading and unloading of the container.

Therefore, it would be a well received and significant improvement to provide a latch which satisfies the above mentioned criteria.

Summary of the invention

It is therefore a primary objective of this invention to provide a clamping ring for the container assembly as described in the above mentioned patent which has the additional feature of a latch to retain the clamping ring in locked position which is pivotally mounted on the clamping ring so that gravity tends to positively seat it in the closed position; and the latch may be pivoted upwardly to facilitate opening of the ring without interference from any parts of the assembly.

Furthermore, means are provided on the clamping ring to provide protective positioning of the latch when it is in a closed position thereby alleviating the possibility of any accidental contact and movement of the latch to the open position. In this manner, the clamping ring is additionally protected against any possible accidental opening of the container assembly and loss of the contents of the container.

Another objective of this invention is to provide a drum type container assembly which has an improved clamping ring provided with a latch mechanism thereon which provides an additional safeguard for alleviating the danger of accidental opening of the container assembly and loss of the contents thereof during shipment and handling. The latch is positioned so that when in the closed position gravity will tend to maintain it in that position and when it is moved to the open position the movement may be accomplished without interference from any portion of the remainder of the container assembly.

In summary, the split clamping ring is of a size and configuration to fit around the assembled cover and chime portion of a drum type container and has a locking mechanism connected between the two ends of the ring for contracting the ring and causing it to tightly embrace the assembly and hold the cover in place. The clamping ring comprises a peripheral band portion made of a resilient metal and having integral flanges along its upper and lower edges projecting radially inward toward the central axis of the ring in slightly diverging relationship to each other. The flanges of the ring engage over an upwardly facing cam surface on the peripheral portion of the cover and over a downwardly facing cam surface formed along the outer surface of the drum beyond the apex portion of the cam surfaces in engagement therewith and exerting a resilient wedging or camming action, wedging the cover into sealing engagement with the chime portion of the container or with a gasket formed therearound.

The locking mechanism includes a locking lever and linkage connected between the adjacent ends of the ring and being pivotally mounted so that the locking lever can pivot outwardly from the lock position to the open position. A latch is connected to the locking ring and is pivotally mounted so that it may pivot upwardly from a normal downwardly biased position where it is in engagement with and retains the locking lever in the locked position. The latch may be pivoted upwardly to an open position where it is free from engagement with the locking lever thereby enabling the locking lever to be pivoted to its open position when desirable. The upward movement of the latch is away from the substantial portion of the remainder of the container assembly thereby facilitating uninterrupted movement thereof.

Other objects and advantages will become apparent from the following detailed description, which is to be taken in conjunction with the accompanying drawings illustrating a somewhat preferred embodiment of the invention.

Brief description of the drawings

In describing the invention, reference is made to the accompanying drawings, in which:

FIG. 1 is an exploded view showing the upper portion of the container and also the cover and clamping ring in space superimposed relationship ready to be assembled with each other;

FIG. 2 is an elevational view of the assembled cover and clamping ring;

FIG. 3 is a top plan view showing the assembly in full lines and indicating in dotted lines the position of the locking lever, when in open position;

FIG. 4 is an enlarged detailed sectional view of the upper chime portion of the container with the cover assembled thereon taken along the plane of line 4—4 of FIG. 3 and showing the clamping ring applied to the assembly;

FIG. 5 is a fragmentary partial sectional top plan view of the upper chime portion of the container and showing the clamping ring applied to the assembly.

Description of the preferred embodiment

In the accompanying drawings the invention is illustrated as applied to a drum type container made of sheet metal such as sheet steel or aluminum. However, it should be understood that the invention is equally applicable to drums made of fiber or of combined fiber and metal and also to such drums having coatings and linings therein.

In the form of my invention, illustrated in FIGS. 1–5, the drum or container has a cylindrical or tubular body portion **10** having a bottom closure **12** also made of metal and permanently sealed and secured to the lower peripheral edge of the body portion. The body portion is open at its upper end as shown and has a chime portion extending around the opening.

The chime portion includes an outwardly turned substantially cylindrical tubular bead **14** frequently designated as a "false wire." As shown in the drawings, the "false wire" or tubular bead serves to support the peripheral portion of the cover **16**.

Suitable outwardly projecting reinforcing and rolling hoops or beads are preferably formed circumferentially around the body portion. These rolling hoops **18** have a larger diameter than the chime portion of the drum and the assembled chime cover and clamping ring. so that the assembled drum can be turned on its side and rolled on hoops **18**. The specific configuration and spacing of the hoops may be varied. Thus they may have a relatively broad and flat band-like outer surface or they may be convexly rounded as shown. In the illustrated embodiment, the two lower hoops are spaced a distance approximately ⅓ of the height of the drum from their respective ends and from each other and this is a commonly used spacing. An additional rolling hoop is illustrated as being positioned a short distance beneath the chime at the open end of the drum and a rolling hoop is frequently provided at this location.

Cover **16** is also made of sheet metal and is of one conventional design having a central disc shaped portion with one or more circular reinforcing beads or ribs **20** formed thereon. A vertically disposed cylindrical portion **21** is formed around the outer portion of the cover and is of a size and configuration as to abut against the inner wall of the chime portion of the container when the container is assembled thereon. A concavo-convex peripheral flange **22** is formed around the outer edge of the cover. The size and configuration of the cover flange should be such that it rests upon the tubular bead **14** of the chime of the container in snugly fitted engagement thereof.

The container and cover assembly heretofor described forms one type of container to which my improved clamping ring may be applied. It may also be applied to other forms of drum type containers, such as fibre drums or drums made of combined fibre and metal.

As illustrated, a split clamping ring **24** is provided and is made of a suitable resilient metal such as steel and provided with suitable locking mechanism connected between the two ends thereof whereby the ring may be expanded to permit its assembly around the combined cover and container or contracted so as to tightly engage the assembled cover and container to hold the cover in place. In this connection, the clamping ring should be of a size and configuration so that it can be extended around the combined cover and container as shown in tightly engaged relationship.

Many suitable locking mechanisms may be employed, as for instance the illustrated mechanism. Thus, I have shown a locking lever **25** pivoted at one end to one end of the split clamping ring and pivotally connected at intermediate point to link **26** which in turn is pivotally connected to the opposite end of the clamping ring. All of the pivotal connections have vertical axes so that the locking lever and link can pivot horizontally outwardly. When pivoted outwardly, as shown, the ring is expanded to permit its assembly of the combined cover and container. When the locking lever is pivoted inwardly, against the surface of the clamping ring, the ring is contracted to exert a compressive force on the assembled parts.

A small latch **27** is pivotally connected to the locking ring adjacent the free end of the locking lever. It will be noted that latch **27** has a downwardly extending finger **28** which will engage with locking lever **25** to retain it in the locked position. Locking lever **25** has a slot **29** which is positioned so as to receive locking finger **28** when latch **27** is in the downward or closed position. Latch **27** is mounted so as to pivot upwardly toward the open position where locking finger **28** is free of locking lever **25** thereby allowing locking lever **25** to be moved to its open position. With latch **27** positioned and movable as shown, gravitational forces will tend to retain latch **27** in its locked position thereby reducing the chance of latch **27** being accidentally open during shipping and handling of the container assembly. Furthermore, by having locking finger **28** extending within slot **29** in locking lever **25**, the danger of accidentally brushing against the surface of latch **27** and forcing it upward to the open position is greatly decreased. It may also be noted that by providing latch **27** to open upwardly away from the remainder of the container assembly facilitates the opening and operation of the latch and locking assembly. There is no chance that latch **27** will contact the upper rolling ring **18** or that the positioning of rolling ring **18** in respect to the latch would interfere with the operator while he is handling the latch and clamping ring.

As an additional aid in helping to maintain latch **27** positively seated in its closed position, a bead **31** is provided on its outer surface which engages with bead **30** on the inner surface of locking lever **25** to cause a tight frictional engagement between surfaces on a locking finger **28** and locking lever **25**. Latch **27** may be fastened to locking ring **24** in any conventional manner such as by means of a rivet as depicted.

The structure and configuration of the clamping ring **24** is clearly illustrated in the drawings. Thus, the ring comprises a peripheral band **33** having integral upper and lower flange portions **34** and **35** extending for substantially the entire length of the ring and projecting radially inwardly toward the axis of the band in slightly diverging relationship.

When the cover is assembled on the container as shown, the upper surface of the peripheral flange **22** of the cover provides an outwardly facing cam surface. In addition, the lower surface of the tubular bead or "false wire" formed around the chime of the container provides a downwardly facing cam surface spaced below the upwardly facing cam surface. The length of the flanges **34** and **35** are such that they extend inwardly beyond the apex portions of the cam surfaces when the ring is assembled around the combined cover and container. Thus, it will be seen that when the cover is placed on the container and the ring is assembled therearound and the locking mechanism is closed, the ring will be contracted around the combined cover and chime portions. When thus contracted, flanges **34** and **35** engage the upper and lower cam surfaces in a tight locking relationship. The spaces between the flanges **34** and **35** of the clamping ring is such that when the ring is assembled in closed position the flanges are slightly expanded in tension, thus exerting a resilient compressive force on the upper surface of the cover flange and the lower surface of the

"false wire" or tubular bead forming the chime of the container. Upper flange **34** is slightly longer than lower flange **35** to facilitate the proper and most desirable locking engagement.

It should be kept in mind that this type of locking assembly may be used with many other types of clamping ring and drum designs in addition to the embodiment shown such as the representative embodiments shown in the above previously mentioned patent.

Turning to the operation of the clamping ring and locking assembly described herein, the cover is first applied to the open end of the container, the clamping ring is assembled around the chime and cover portion while the locking mechanism is in open position. Thereafter, the locking mechanism is locked to contract the locking ring causing the flanges of the locking ring to engage against the upper and lower cam surfaces and be expanded thereby until a tight locking relationship is attained. Then, the latch is rotated downwardly into its locking position where it will retain the locking mechanism in the locked position. It will be seen that gravitation forces will assist in retaining the latch in its closed position and the diretcion of travel of the latch as it is opened will be away from all other surfaces of the container assembly thereby facilitating the opening thereof without inteference from other parts of the assembly. The locking ring exerts a resilient compressive force to hold the cover in sealing engagement with the chime or with a gasket formed therearound, thus leaking or sifting between the cover and chime is minimized or eliminated. It will also be seen that the locking ring and latch provided an improved reinforced structure that can withstand the forces and impact normally encountered during shipping or storage.

In view of the foregoing, the aforenoted objects and advantages are effectively attained. Although a somewhat preferred embodiment of the invention has been disclosed herein, it should be understood that the invention is in no sense limited thereby.

We claim:

1. An improved clamping ring for use in releasably holding a cover in assembled relationship with a drum type container of the type in which the upper surface of the container chime is overlapped by a peripheral flange of the cover which presents an upwardly facing rounded shoulder forming an upwardly facing first cam surface and the container also has a rounded shoulder in its outer surface spaced downwardly a short distance beneath the top of the chime and forming a downwardly facing second cam surface, said clamping ring comprising:

a split ring made of a resilient metal and having a contour and length so that it can tightly encompass the container chime with the cover assembled thereon and a locking assembly connected between the adjacent ends of the ring and shiftable from an open position with the ring in expanded relation to a locked position with the ring in contracted relation, said ring being formed with a peripheral band portion having integral flange portions extending for substantially the entire length of the band and projecting radially inwardly toward the axial center of the band in slightly diverging relation, the length of the respective flanges being such that they extend slightly beyond the apex portion of the upper and lower cam surfaces when the clamping ring is assembled around the combined chime and cover whereby when said clamping ring in said assembled position is contacted by the locking assembly, the flanges are expanded over the cam surfaces in compressive engagement therewith, said locking assembly including a locking lever and linkage connected between the adjacent ends of the ring and being pivotally mounted so that the locking lever can pivot outwardly from the lock position to the open position, a latch connected to the locking ring and being pivotally mounted so that the latch may pivot upwardly from a normal downwardly biased position where it is in engagement with and retains the locking lever in the lock position to an open position where it is free from engagement with the locking lever thereby enabling the locking lever to be pivoted to the open position thereof.

2. The invention in accordance with claim **1** wherein the locking lever is mounted on said ring so that it may pivot outwardly horizontally from the lock position to the open position, the latch normally extends horizontally and has a downwardly extending locking finger which engages with surfaces on the locking lever to retain the locking lever in the lock position when the latch is in the normal downwardly biased horizontal position, and when said latch is pivoted upwardly to an open position the locking finger will be disengaged from the locking lever thereby enabling the locking lever to be pivoted to the open position thereof.

3. The invention in accordance with claim **1** wherein the locking lever has surfaces which define a slot therein to receive the locking finger when the latch is in the normal downwardly biased position and to be disassociated with the locking finger when the finger is pivoted upwardly to the open position thereof.

4. An improved drum type container assembly comprising:

a container body having an open end with a chime formed therearound and also having a downwardly facing rounded shoulder formed around its exterior a short distance beneath the top of the chime to provide a downwardly facing cam surface;

a cover removably applied to the open end of the container and having a peripheral flange with an upwardly rounded shoulder overlapping the top of the chime and forming an upwardly facing cam surface;

a split clamping ring made of a resilient metal assembled around said combined container chime and cover and having a locking assembly connected between the adjacent ends of the ring and shiftable from an open position with the ring in expanded relation so as to be removable from the chime and cover to a locked position with the ring in contracted relation tightly engaging the chime and cover, said ring being formed with a peripheral band portion and having integral flange portions extending for substantially the entire length of the band and projecting radially inwardly toward the axial center of the band in slightly diverging relationship, the length of the respective flanges being such that they extend slightly beyond the apex portions of the upper and lower cam surfaces when the clamping ring is assembled around the combined chime and cover whereby when said clamping ring in said assembled position is contacted by the locking assembly the flanges are expanded over the cam surfaces in compressive engagement therewith, said locking assembly including a locking lever and linkage connected between the adjacent ends of the ring and being pivotally mounted so that the locking lever can pivot outwardly from the locked position to the open position, a latch connected to the locking ring and being pivotally mounted so that the latch may pivot upwardly from a normal downwardly biased position where it is in engagement with and retains the locking lever in the locked position to an open position where it is free from engagement with the locking lever, thereby enabling the locking lever to be pivoted to the open position thereof.

5. The invention in accordance with claim **4** wherein the locking lever is mounted on the ring so that it may pivot outwardly horizontally from the locked position to the open position, the latch normally extends horizontally and has a downwardly extending locking finger which engages with surfaces on the locking lever to retain the locking lever in the locked position when the latch is in the

normal downwardly biased horizontal position and when the latch is pivoted upwardly to an open position the locking finger will be disengaged from the locking lever, thereby enabling the locking lever to be pivoted to the open position thereof.

6. The invention in accordance with claim 5 wherein the locking lever has surfaces which define a slot therein to receive the locking finger when the latch is in the normal downwardly biased position and to be disassociated with the locking finger when the finger is pivoted upwardly to the open position therof.

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