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H. H. SOMERS

2,687,231

STACKING DEVICE

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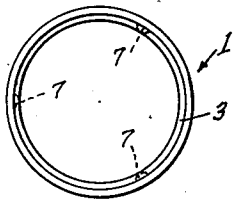


Fig.-1.

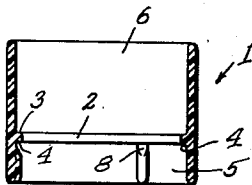


Fig.-2.

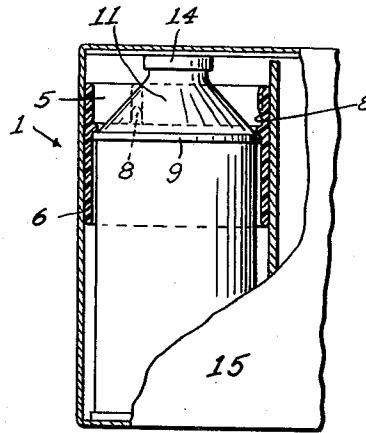


Fig.-3.

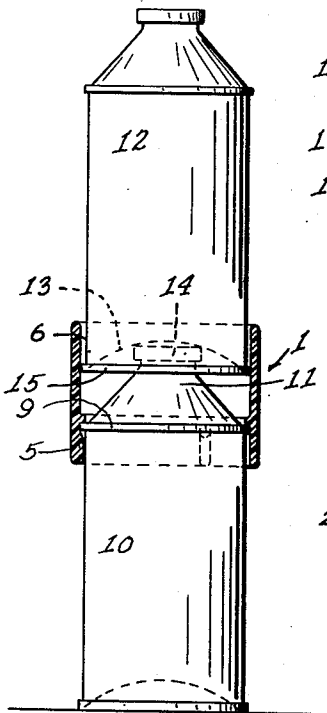


Fig.-4.

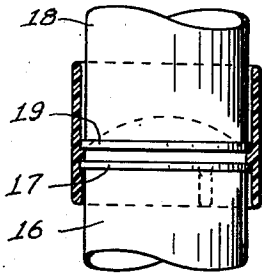


Fig.-5.

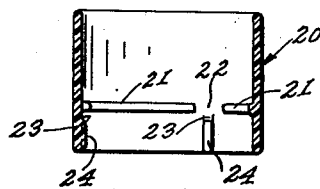


Fig.-6.

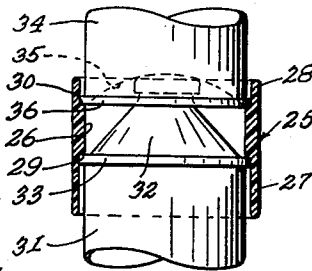


Fig.-7.

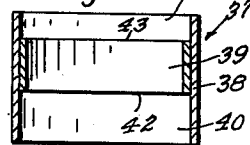


Fig.-8

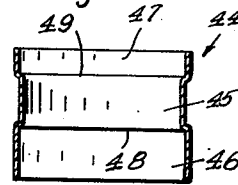


Fig.-9.

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STACKING DEVICE

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7 Claims. (Cl. 220-97)

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This invention relates generally to the art of stacking various commodities or articles and more particularly is directed to a stacking device for containers, such as cans.

The stacking device, embodying the improved principles of design and construction of the subject invention may be employed wherever applicable but has proven particularly useful and convenient in stacking cans of beer, and cans containing other commodities in a refrigerator where the available storage space is restricted or limited. Most every person, at one time or another, has attempted to conserve space by stacking cans one upon the other in such a space and then later, upon opening the door of the refrigerator, find with regret, that one can has toppled over onto a dish, spilling and spattering its contents, usually some sticky liquid, on adjacent containers and produce as well as on items on shelves below. Greater difficulty in stacking is, of course, encountered when the top ends of the cans are conical in shape as in some beverage cans.

Accordingly, one of the principal objects of the invention is to provide a novel tubular stacking device for conserving space and which is so designed and constructed that it can be readily applied to cans of different shapes in either of two positions. More particularly in this respect, when a device embodying the preferred form of the invention is manually applied to the top of a can in one position it may be utilized to support and retain another can in place thereabove and when removed and reapplied in a reversed position the device is rendered incapable of supporting another can but has the distinct advantage of conserving space when a can carrying the device in this manner is packed with other cans in a carton or box for transport.

The attributes referred to in the preceding paragraph are accomplished by providing the device with internal abutment means which is located somewhat closer to one end of the device than the other end so that the device in effect forms a comparatively long socket and a short socket. The device is so constructed that when applied to cans having conical tops or formations other than flat ends, the short socket will receive the upper cylindrical portion of a lower can including the conical top end of the lower can. When applied in this manner, the underside of the internal abutment means bears against the top rim of the lower can and the bottom end wall of the upper can will find support on the end of the conical portion of the lower can. When the same stacking device is applied to

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cans not having conical ends, the underside of the abutment means will bear against the upper rim of the lower can and the lower rim of the upper can will find support on the upper side of the abutment means. In this application the abutment means is common to both cans.

A significant object of the invention is to provide a stacking device which is preferably constructed of moulded plastic having inherently yieldable properties whereby to promote its manufacture and removal from moulding dies and assist in maintaining the device in place when applied to a can.

An additional object of the invention is to provide an improved stacking device which is light in weight, practically unbreakable, easy to clean, efficient for the purpose intended, and which can be economically manufactured on a production basis.

Another object of the invention resides in providing the stacking device with a plurality of internal longitudinal stay means which assist in stabilizing and securing the device to a can and in providing the stay means with seats, the radial distances to the base of the seats being slightly greater than the radial distances to the stay means so that when the device is applied to a can the stay means, due in part to the inherent resiliency of the device, may in some measure frictionally engage the upper rim of a lower can and then allow the device to more or less snap into place with the seats engaging the rim.

The stacking device may be designed and constructed in other ways without departing from the spirit of the invention and with this factor in mind, a further object of the invention is to provide a device in which the internal abutment means can be modified to adapt the device for different applications of use.

Other objects and advantages of the invention will become apparent after the drawings illustrating various embodiments thereof are considered in conjunction with the description hereinafter set forth.

In the drawings wherein five embodiments of the invention are exemplified:

Figure 1 is a top view of a preferred and first form of stacking device embodying the invention;

Figure 2 is a vertical section of the device shown in Figure 1;

Figure 3 is a partial view of a carton and a can therein showing the stacking device carried by the can in a position to conserve space in the carton;

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Figure 4 is a side elevational view showing the stacking device, in section, applied to a pair of cans of one style or shape;

Figure 5 is a partial side elevational view showing the stacking device, in section, applied to a pair of cans of a different style or shape;

Figure 6 is a vertical sectional view of a second form of stacking device embodying the invention;

Figure 7 is a partial side elevational view showing a third form of a stacking device, in section, applied to a pair of cans;

Figure 8 is a vertical section of a fourth form of a stacking device; and

Figure 9 is a vertical section of a fifth form of a stacking device embodying the invention.

The five embodiments of the invention will be described in the order of their appearance in the drawings.

The first and preferred form of stacking device exemplified in Figures 1 through 5 of the drawing is generally designated by a numeral 1. This device may be made in any cross-sectional configuration desired to fit containers or cans of a corresponding configuration, but as herein shown is preferably made in the form of a tubular cylinder and constructed of a moulded plastic having yieldable properties when formed. The device is provided with an integral internal annular ring portion 2 of uniform radial extension which constitutes abutment means having an upper side 3 and a lower side 4. The abutment means is preferably located somewhat closer to one end of the device than the other to provide a relatively short socket 5 and a relatively long socket 6 to facilitate application of the device to containers or cans in the manner alluded to above.

The short socket 5 is preferably provided with three corresponding equally spaced apart integral internal longitudinal stay means 7. The inner end portions of the stay means are slightly inclined at 8 to preferably form in combination with the lower side 4 of the abutment means three inset seats or recesses, which are adapted to receive the upper rim joint, or bead 9, of a lower can 10 having a truncated conical portion or extension 11.

As pointed out above, this particular device is so designed and constructed that the radial distances to the stay means 7 are preferably equal and slightly less than the radial distances to the seats and the radial distances to the rim bead 9 so that some force will ordinarily be required to press the device onto the can 10. This arrangement, and the fact that the device is inherently resilient, will produce a predetermined coefficient of friction between the stay means and the bead 9, as the device is being applied to the can 10 and when the device approaches its final position the inclinations 8 will tend to cause the device to more or less automatically cam and snap itself into its final proper position with the bead 9 yieldably held in the seats, with the lower side 4 of the abutment means, acting as a stop, bearing on the bead 9.

The cylindrical wall defining the short socket 5 is preferably of a length to surround the upper cylindrical portion of the can 10 for a distance sufficient to maintain the device in a satisfactory erect position. The stay means may engage the can to assist in stabilizing the position of the device.

When the device is applied to a can 10 as illustrated in Figure 4 the truncated conical portion 11 of the can will extend upwardly through the opening defined by the ring portion 2 and into

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the long socket 6, so that a can 12 can be inserted into the socket 5 with its concave bottom end wall 13 resting on the end cap 14 of the can 10. The inside diameter of the socket 6 is preferably slightly greater than the diameter of the lower bead 15 of the can 12 so that the can can be readily inserted and removed without affecting the snug connection established between the short socket and can 10. The length of socket 6 is sufficient to appreciably prevent rocking or wobbling of can 12.

Thus it will be manifest that the device 1 serves to maintain a pair of cans or containers in axial alignment, one above the other, for the purpose of conserving space, particularly in those places where the horizontal shelf space available for storage is restricted and there is sufficient vertical space to allow for stacking.

As clearly exemplified in Figure 3 of the drawing the device 1 is so designed and constructed that it may be applied in a reversed position to a can such as 10 and when so applied the long socket 6 receives the upper cylindrical portion of the can with the side 3 of the abutment means bearing on the bead 9 to position the short socket 5 about the conical portion 11 of the can and so that the marginal end of the short socket 5 is located below the end cap 14. This particular device is unique because it facilitates packing of the devices along with the cans in a carton or box 15 and at the same time enables one to utilize a much smaller carton or box which is important from the standpoints of cost and handling.

The device 1 may also be utilized to assemble containers of a type having substantially flat ends as depicted in Figure 5. When applied to a can 16 of this type the seats will receive the bead 17 thereof with the side 4 of the abutment means bearing on the bead. When another can 18 of this type is placed in the long socket 6 its bead 19 will rest on the side 3 of the abutment means. The abutment means is thus common to both cans. Obviously, the end walls of the cans may be planar or concave.

As indicated above, the device 1 is preferably constructed of a moulded plastic having yieldable properties when moulded for the purpose of yieldably embracing a lower can. During the moulding operation it is necessary to slightly expand the device when portions of the male die are being withdrawn from inset seats. More specifically in this regard, those portions of the male die which form the seats will engage the inclined portions 8 of the stay means and cause the device to gradually expand as the die is pulled from the short socket.

If found desirable, expansion of the device in moulding may be avoided by constructing a modified device 20 in accordance with Figure 6 of the drawing. In this second embodiment of the invention the abutment means is comprised of three corresponding arcuate portions 21 (only two shown) which are spaced apart circumferentially as indicated at 22 so that portions of a die forming the inclined portions 23 of seats or stay means 24 can be readily withdrawn. This modified device 20 can be applied to a can or cans in the same manner as device 1.

The third embodiment of the invention exemplified in Figure 7 of the drawing is preferably moulded. The device 25 of this embodiment is formed to provide an abutment means 26 of a greater axial length than those above referred to. More specifically, stay means are omitted

and the extremities of the device are provided with counter-recesses or openings of unequal length to provide a long socket 27 and a short socket 28. The sides or ends 29 and 30 of the abutment means constitute the bases of the long and short sockets, respectively. When this device is applied to a can 31 having a conical portion 32, the side 29 of the abutment means will rest on the bead or rim 33 of the can and when a second can 34 having a concave bottom end wall 35 is placed in the short socket 28 its bead 36 will find support on the side 30 of the abutment means 26. The device 25 may be applied to cans of the types described above and it will be noted that when applied as in Figure 7, it is not necessary to reverse its position for packing purposes as required in embodiments one and two of the invention because the marginal end of the short socket 28 is located substantially flush with the end cap of the lower can 31. Obviously, an upper can having a planar bottom end wall cannot be supported in the short socket if the device is first applied to a can 31 having a conical portion.

The fourth embodiment of the invention illustrated in Figure 8 of the drawing is quite similar to the third embodiment. The device 37 of this fourth embodiment is comprised of an outer tubular cylindrical shell 38 and an inner tubular cylindrical shell 39 secured in a fixed position in the outer shell to provide a long socket 40 and a short socket 41. The inner shell constitutes the abutment means having sides or ends 42 and 43 which form the bases of the long and short sockets, respectively, for engaging the rims or beads of cans substantially in the same manner as described above.

The fifth embodiment of the invention depicted in Figure 9 of the drawing is similar to the third and fourth embodiments. The stacking device 44 of the fifth embodiment is identified to form an abutment means 45 arranged to provide a long socket 46 and a short socket 47. The sides or ends, 48 and 49, of the abutment means constitute the bases of the long and short sockets, respectively.

While the foregoing description has been given in detail, it is not the intention to thereby restrict the scope of the invention beyond that defined by the appended claims since the inventive principles thereof are capable of assuming physical embodiments other than those hereinbefore described. Also, it is to be understood that the various stacking devices may be constructed of any material suitable for the purpose, such as plastic as stated above, paper, metal and glass, without departing from the spirit of the invention.

I claim:

1. A stacking device for cylindrical beaded cans comprising a cylindrical resilient collar open throughout its length, arcuate abutment means extending inwardly from the inner surface of the collar and dividing the collar into sockets of different axial lengths for respectively receiving cans, and a plurality of circumferentially spaced axially extending ribs provided on the inner surface of the socket of shortest axial length, the inner ends of the ribs terminating in spaced relation to the arcuate abutment means to form in combination therewith a plurality of seats for receiving the bead of a can.

2. A stacking device for cylindrical beaded containers comprising an elongated cylindrical collar open throughout its length, radial abut-

ment means extending inwardly from the inner surface of the collar and dividing the collar into sockets for respectively receiving containers, and a plurality of circumferentially spaced inwardly extending stay means provided on the inner surface of one of the sockets, each of said stay means having a surface terminating in spaced relation to the radial abutment means to form in combination therewith a seat for receiving the bead of a can and so that the cylindrical wall of the can will engage the stay means to locate the wall in spaced concentric relationship to the inner surface of the socket provided with such stay means.

3. A stacking device for cylindrical beaded containers comprising a cylindrical collar open throughout its length, radial abutment means extending inwardly from the inner surface of the collar to form an opening and divide the collar into sockets, a plurality of circumferentially spaced inwardly extending stay means provided on the inner surface of one socket, each of said stay means having a surface terminating in spaced relation to the radial abutment means to form in combination therewith a seat, a container having a cylindrical wall provided with a bead disposed in the seats with the cylindrical wall engaging the stay means to locate the cylindrical wall in spaced concentric relationship to the inner surface of the socket provided with such stay means, and said container also having a tapered portion extending through said opening into the other socket.

4. A stacking device for cylindrical beaded containers comprising a cylindrical resilient collar open throughout its length, radial abutment means extending inwardly from the inner surface of the collar and dividing the collar into short and long sockets for respectively receiving containers, a plurality of circumferentially spaced inwardly extending stay means provided on the inner surface of the short socket, each of said stay means having a surface terminating in spaced relation to the radial abutment means to form in combination therewith a seat, a container having a cylindrical wall provided with a bead disposed in the seats with the cylindrical wall engaging the stay means to locate the wall in spaced concentric relationship to the inner surface of the short socket, and said container also having a tapered portion extending through the opening into the long socket, the arrangement being such that when the collar is reversed so that the container is received in the long socket with the tapered portion extending through the opening, the free end of the short socket will take an inset or flush position with respect to the free end of the tapered portion of the container.

5. A stacking device for cylindrical beaded containers comprising an elongated cylindrical collar open throughout its length, radial abutment means extending inwardly from the inner surface of the collar and dividing the collar into sockets for respectively receiving containers, and a plurality of circumferentially spaced inwardly extending stay means provided on the inner surface of one of the sockets, each of said stay means having a surface located in spaced relation to the radial abutment means and forming in combination therewith a seat for receiving and engaging the bead of a can so that the cylindrical wall of the can will be located in spaced concentric relationship to the inner surface of the socket provided with such stay means.

6. A stacking device for cylindrical beaded con-

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ainers comprising a cylindrical resilient collar open throughout its length, radial abutment means extending inwardly from the inner surface of the collar and dividing the collar into short and long sockets for respectively receiving containers, a plurality of circumferentially spaced inwardly extending stay means provided on the inner surface of the short socket, each of said stay means having a surface located in spaced relation to the radial abutment means and forming in combination therewith a seat, a container having a cylindrical wall provided with a bead disposed in the seats and with the cylindrical wall disposed in spaced concentric relationship to the inner surface of the short socket, and said container also having a tapered portion extending through the opening into the long socket, the arrangement being such that when the collar is reversed so that the container is received in the long socket with the tapered portion extending through the opening, the free end of the short socket will take an inset or flush position with respect to the free end of the tapered portion of the container.

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7. A stacking device for cylindrical beaded cans comprising a cylindrical resilient collar open throughout its length, radial abutment means extending inwardly from the inner surface of the collar and dividing the collar into sockets of different axial lengths for respectively receiving cans, and a plurality of circumferentially spaced inwardly extending stay means provided on the inner surface of the socket of shortest axial length, each of said stay means having a surface located in spaced relation to the radial abutment means to form in combination therewith a plurality of seats for receiving the bead of a can.

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