

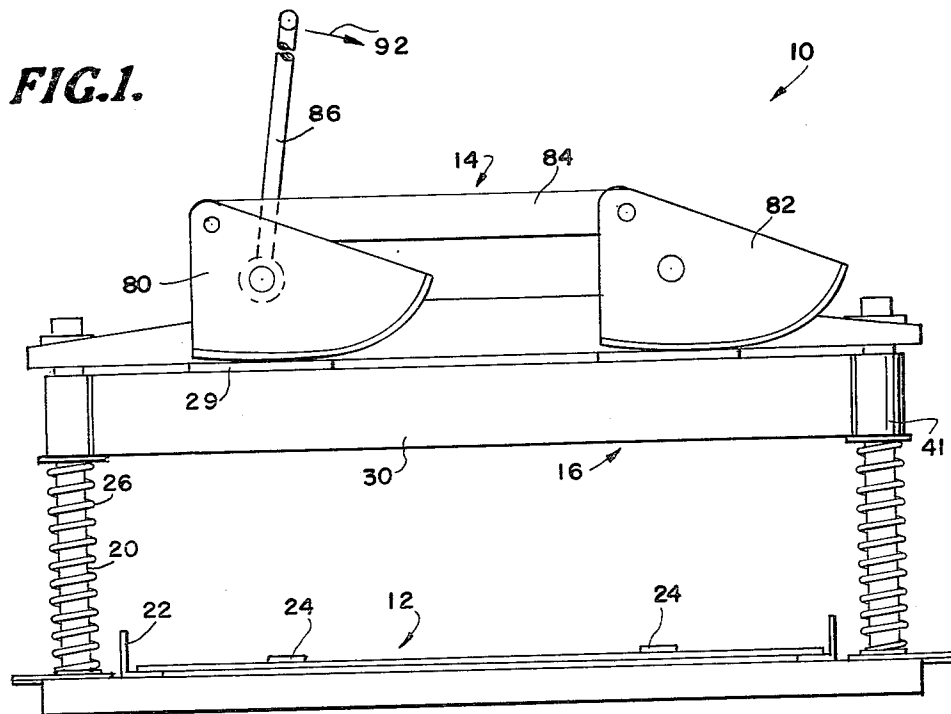
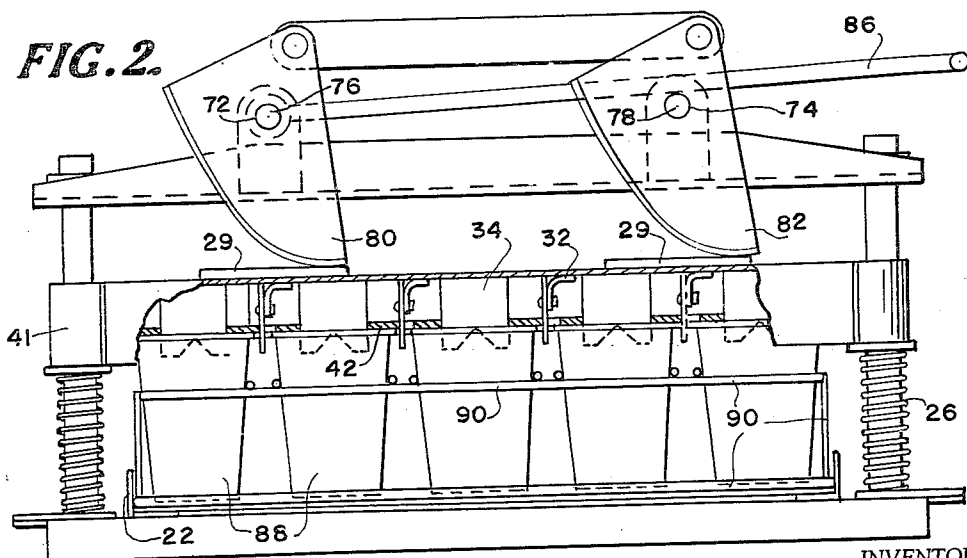
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C. L. WILLIAMS
CUP LID CAPPER AND SEPARATOR

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2 Sheets-Sheet 1



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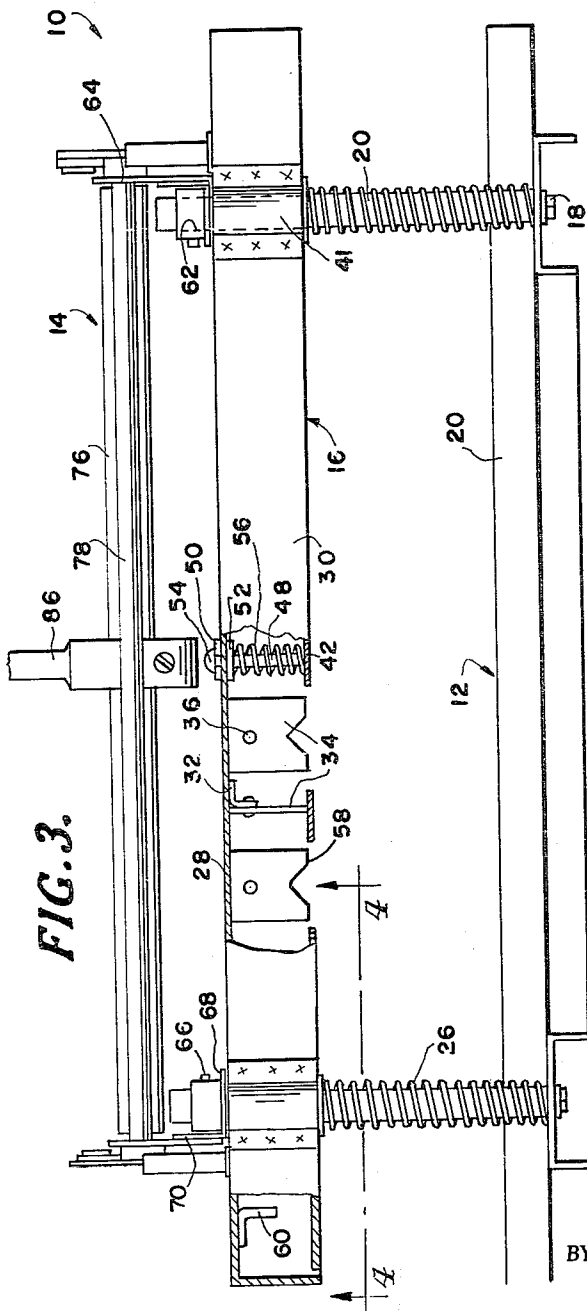
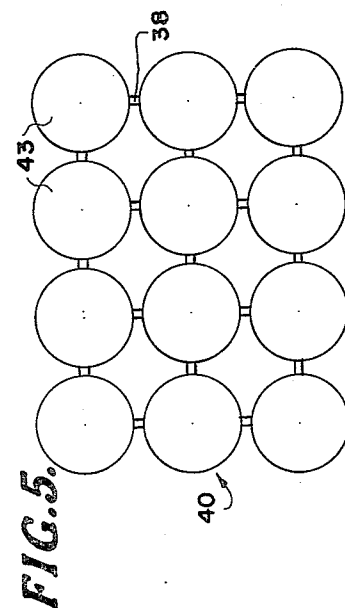
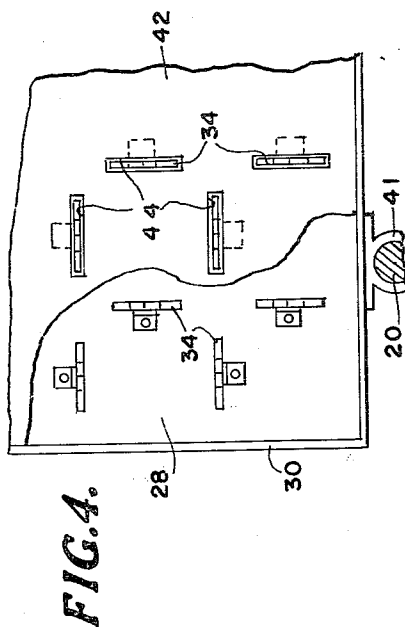
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CUP LID CAPPER AND SEPARATOR

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The invention described herein relates to an apparatus for applying a plurality of caps simultaneously to an assembly of containers. More specifically, the invention relates to an apparatus which applies and separates a plurality of specially formed caps to a like number of paper containers into which a liquid has been dispensed.

The capping apparatus constructed in accordance with the teachings of the present invention is used in conjunction with some form of high capacity device for filling paper cups or containers with a liquid, preferably a beverage.

When the beverage is to be sold to a large group of people, it is customary to distribute it by means of trays containing a number of cups, usually between twelve and forty. However, under the old arrangement, it was difficult to avoid spilling the beverage before it was received by the customer. Furthermore, the open cup or container was unsanitary. Also, while lids or caps have been used to some extent to cover drinking cups, they were secured to the cups one at a time in a slow, tedious, and uneconomical process.

This invention, therefore, is concerned with an improved economical apparatus which will allow larger numbers of cups or containers to be capped rapidly without requiring additional labor for the process.

Accordingly, it is an object of the present invention to provide a high capacity capping apparatus.

Another object of the present invention is the provision of an apparatus for applying a plurality of lids simultaneously to an assembly of containers.

Still another object of the present invention is the provision of an apparatus for applying a plurality of lids, joined at their peripheries, to a like number of cups, and separating the lids from one another.

A further object of the present invention is the provision of an apparatus for applying a sheet of individually formed container lids having integral connecting portions to an assembly of containers including pressure means movable to engage the lids and secure them to the containers, and cutting means to separate the lids by severing the connecting portions.

Further objects and advantages will become apparent by referring to the following detailed description when taken with the appended claims and accompanying drawings wherein:

FIGURE 1 is a side elevational view of the capping and separating apparatus of the disclosed invention showing it in a first withdrawn position;

FIGURE 2 is a side elevational view similar to that of FIGURE 1, but showing the invention in a second engaging and cutting position;

FIGURE 3 is a front elevational view of the invention, partially cut away and in section;

FIGURE 4 is a fragmentary view of the apparatus partially cut away as taken along line 4—4 of FIGURE 3; and,

FIGURE 5 is a top plan view showing a sheet of lids connected together adjacent their peripheries.

Referring now to the drawings, reference numeral 10 indicates generally the capping and separating apparatus of the present invention having a base member 12, a handle and cam arrangement 14, and a knife housing unit 16. Fastened to each corner of base member 12, as by bolts 18,

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are support rods 20 extending vertically therefrom. Also secured to the base member 12, by welding or other suitable means, are guide members 22 extending the width of the apparatus. A pair of tray stops 24 are likewise suitably secured to the base member at one end thereof. A spring 26 surrounds each support rod 20, one end thereof engaging the base member 12.

Located above base member 12 and spaced therefrom is knife housing unit 16. The knife housing comprises a top member 28 of generally rectangular shape, and four sides depending vertically therefrom, as at 30. Attached by welding or other suitable means to the underside of top member 28 are a plurality of bracket members 32 to which are fastened cutting elements or knives 34, for example, by means of screws 36. The knives 34 are arranged (see especially FIGURE 4) to engage the connecting portions 38 of a sheet of lids shown generally at 40, as will be hereafter described.

The knife housing unit 16 rests upon the top ends of springs 26, bearings 41 for slidably receiving support rods 20 therein being secured to the depending side 30 as by welding or other suitable means.

Generally parallel to top member 28 and spaced therefrom is a pressure plate 42 having a plurality of slots 44 formed therein to allow knives 34 to pass therethrough. A number of rods 48 are secured to pressure plate 42 about its perimeter as by welding, and extend upwardly therefrom. The rods 48 pass freely through circular openings suitably located in the top member 28. Washers 50 and 52 which are larger than the circular openings are placed on the rod to both sides thereof. A screw 54 prevents washer 50 from sliding off rod 48. A compression spring 56 surrounds rod 48 between members 28 and 42 and serves to bias them apart. When members 28 and 42 are fully spaced apart, the tips 58 of knives 34 are located above pressure plate 42 in a position fully retracted from slots 44. Secured in a suitable manner to the underside of top member 28 in each corner thereof, is a pressure plate stop member 60.

The handle and cam arrangement 14 is supported on rods 20 which are received by circular openings 62 passing through support members 64 and is fastened thereto by means of locking screws 66. A pair of support members 64 are attached to a supporting angle member having a horizontal portion 68 and an upstanding portion 70. A second pair of support members 64 are likewise attached to a second angle member on the opposite side of the apparatus. Fastened to the upstanding portions 70 is a pair of bearing members 72 and 74 for receiving, respectively, large cam shaft 76 and small cam shaft 78. Cams 80 are secured to the ends of shaft 76 while cams 82 are secured to the ends of shaft 78, and a linkage 84 connects each pair of cams. Fastened to the large cam shaft 76 at a point midway between upstanding portion 70, is a handle 86.

Operation

To commence the operation, a plurality of cups 88 to be filled with a beverage are placed in a tray 90 having means therein to hold the cups apart at equally spaced intervals. The cups are then filled, and a sheet 40 having a number of individual lids or closures 43 equal to the number of cups on the tray is placed thereover, the lids 43 located in preliminary registry with the cups. It should be noted that the center-to-center spacing of the lids 43 in the sheet corresponds with the center-to-center spacing of the cups 88 as placed in tray 90.

With the sheet of lids thus located in general registry with the cups in the tray, tray 90 is then slid into the end of the capper and separator apparatus, sliding on the base member 12 and guided by members 22. The tray is moved into the apparatus until it strikes the tray

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stops 24 which have been previously located to provide proper registration of the tray within the capper and separator apparatus.

At this point, handle 86, cams 80 and 82, and the knife housing unit 16 are positioned as shown in FIGURE 1. The handle is then moved forwardly and downwardly in a direction as indicated by arrow 92, thereby rotating larger cam shaft 76 and cams 80. Cams 82, connected to cams 80 by linkage 84 are also rotated about small cam shaft 78. Bearing upon bearing plates 29 atop member 28, the cams cause the knife housing unit 16 to move downwardly toward base member 12 against the bias of springs 26. Upon the downward movement of housing 16, the pressure plate 42 bears upon the lid sheet 40.

As the handle is further moved in the general direction of arrow 92, the pressure plate remains essentially stationary in a position engaging the top rim of the caps and bearing upon lid sheet 40. The top member 28, however, continues to move downwardly toward pressure plate 42 against the bias of spring 56, the knife members 34 passing through slots 44 in the pressure plate and cutting through the connecting portions 38 of the lid sheet 40. The knife members 34 continue this cutting process until the pressure plate stop members 60 engage the top surface of the pressure plate.

At this point, further movement of handle 86 in the general direction of arrow 92 will cause the top member 28 and pressure plate 42 to move downwardly in unison toward base member 12. With the springs 56 fully compressed and pressure plate 42 butted up against stop member 60, the total force applied to handle 86 is transmitted to the pressure plate through cams 80 and 82 acting upon top member 28 against the bias of spring 26. The pressure plate in turn bears down upon the lid sheet 40, pressing the individual lids 43 into engagement with the rims of cups 88.

With the individual lids thus separated from one another and in firm engagement upon the rims of the cups, handle 86 is then raised to its original position (as shown in FIGURE 1), springs 26 urging knife housing unit 16 upwardly out of engagement with the cups, and springs 56 urging pressure plate 42 away from top member 28.

The tray 90 is removed from the capper and separator 10, and the individual cups, filled with the beverage and capped, are ready for distribution.

Although the preferred embodiment of the device has been described, it will be understood that within the purview of this invention various changes may be made in the form, details, proportion, and arrangement of parts, the combination thereof, and the mode of operation, which generally stated consist in a device capable of carrying out the objects set forth, as disclosed and defined in the appended claims.

What is claimed is:

1. An apparatus for applying a plurality of joined covers to an assembly of containers including a base member; guide means on said base to position said assembly of containers with said joined covers in overlying relation thereto; a movable platen vertically disposed with respect to and spaced from said base member, said platen including cutter means to separate said joined covers and apply the same to said containers.

2. An apparatus as defined in claim 1 wherein said base member includes guide means for said movable platen.

3. An apparatus for separating and applying a sheet of integrally joined closures to an assembly of containers comprising: means to assemble said containers; a base supporting said container assembly means; guide means on said base to position said assembly of containers for a closure, separating, and applying operation; a movable pressure platen in vertical alignment with and spaced from said base, said platen including cutter means thereon; guide means on said base in operative engagement

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with said platen; operating means positioned to move said platen; means supporting said platen operating means; said platen movable from an inoperative to an operative position into engagement with said closures whereby said closures are separated from each other and secured to said assembly of containers.

4. An apparatus as defined in claim 3 wherein said guide means for said movable pressure platen are secured to said base at each corner thereof.

5. An apparatus as defined in claim 3 wherein said platen operating means includes a plurality of pivoted cam members.

6. An apparatus as defined in claim 3 wherein said support means for said platen operating means is secured to said platen guide means.

7. An apparatus as defined in claim 3 wherein said platen guide means further includes resilient means mounted thereon.

8. An apparatus as defined in claim 7 wherein said resilient means is mounted on said platen guide means between said platen and said base.

9. An apparatus for separating and applying a sheet of integrally connected closures to a group of containers comprising: a rack for grouping said containers, a base supporting said rack and containers; guide rails on said base for positioning said rack and containers for a closure, separating, and applying operation; a movable pressure platen vertically disposed and aligned with said base, said platen including a plurality of cutters; guide means on said base adjacent said guide rails and in operative engagement with said platen; resilient means on said guide means to bias said platen in a direction away from said base; operating means to move said platen from an inoperative position to an operative position engaging said sheet of integrally connected closures whereby said closures are separated from each other and applied to said group of containers, said movable pressure platen comprises a closed upper end portion; a plurality of wall portions depending therefrom, a plurality of cutters secured to said upper end portion in the area defined by said perpendicular wall portions; a pressure plate in overlying relation to said cutters and having portions defining openings in alignment therewith, said pressure plate movable towards said upper end portion whereby said cutters project through said openings.

10. An apparatus as defined in claim 9 wherein said closed upper end of said platen includes portions defining openings therein; and guide pins secured to said pressure plate aligned with and extending through said openings in said upper end of said platen.

11. An apparatus as defined in claim 9 which further includes resilient means mounted on said guide pins secured to said pressure plate between said upper end portion of said platen and said pressure plate.

12. An apparatus for separating and applying a sheet of integrally joined closures to a group of containers comprising: a rack to assemble said containers into a group; a substantially rectangular base supporting said rack and containers; guide rails on said base for positioning said rack and containers with said closures in overlying relation thereto for a closure, separating, and applying operation; a movable pressure platen vertically disposed with respect to said group of containers; guide posts secured to said base at each corner thereof and in operative engagement with said pressure platen; operating means for said pressure platen supported by said guide posts and in operative engagement with the upper surface of said platen, said operating means including a plurality of pivoted cam members; a pressure plate mounted on said platen and movable relative thereto; a plurality of cutters secured to said platen to separate said joined closures, said pressure plate holding said closures in position on said containers during the separation thereof by said cutters, said platen operating means includes a pair of supports secured to said platen guide

posts; a first shaft member pivotally mounted in said supports; a first pair of cam members secured to each end of said shaft; a second shaft member pivotally mounted in said supports, a second pair of cam members secured to each end thereof; and links pivotally secured to and connecting each of said first pair of cam members to each of said second pair of cam members.

13. An apparatus as defined in claim 12 wherein said first and second shaft members are spaced apart and parallel to each other.

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