June 24, 1958 E. N. DE BASTOS ET AL 2,839,882

CONTAINER CAPPING MACHINES

Filed Oct. 28, 1955 2 Sheets-Sheet 1

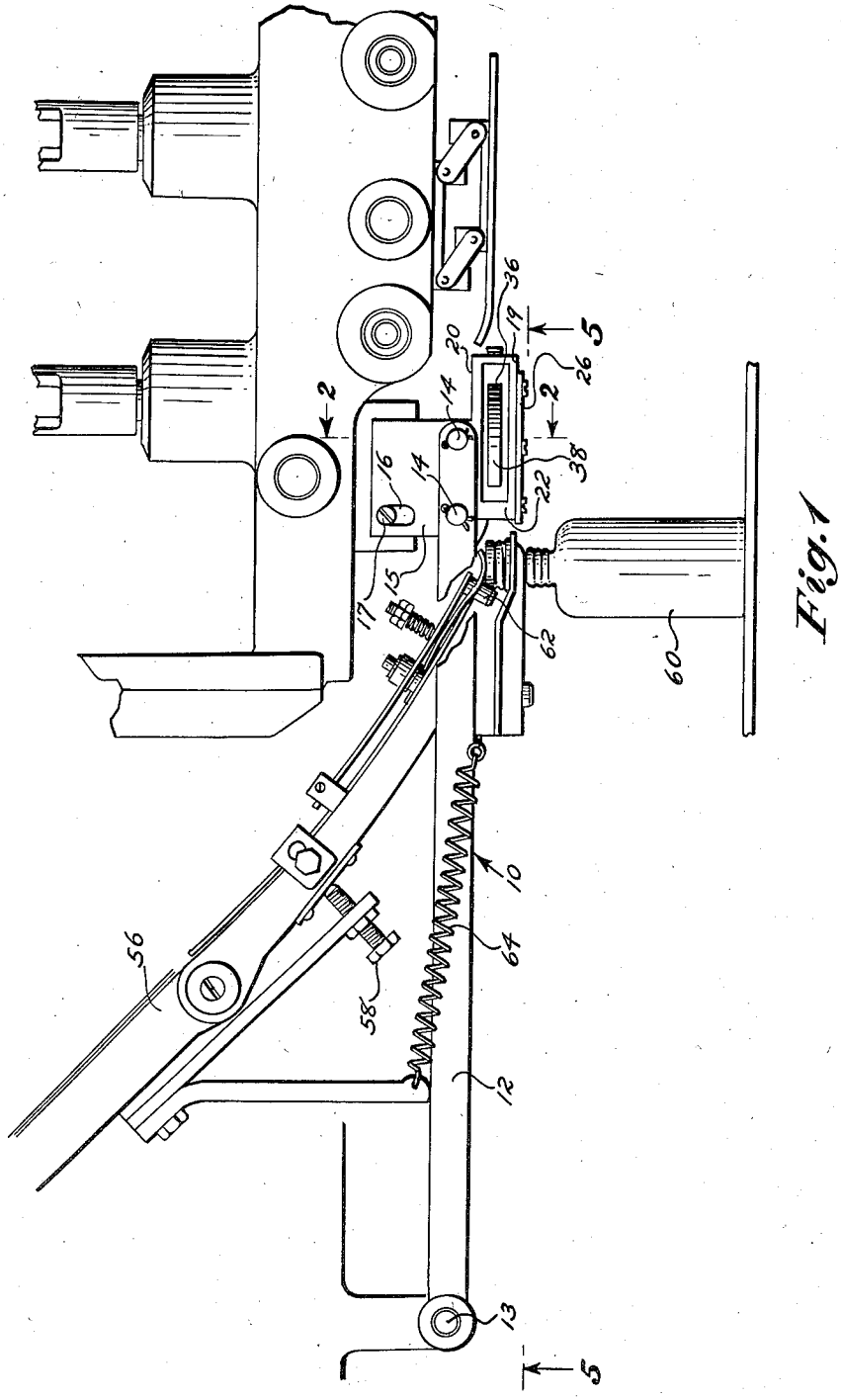


Fig. 1

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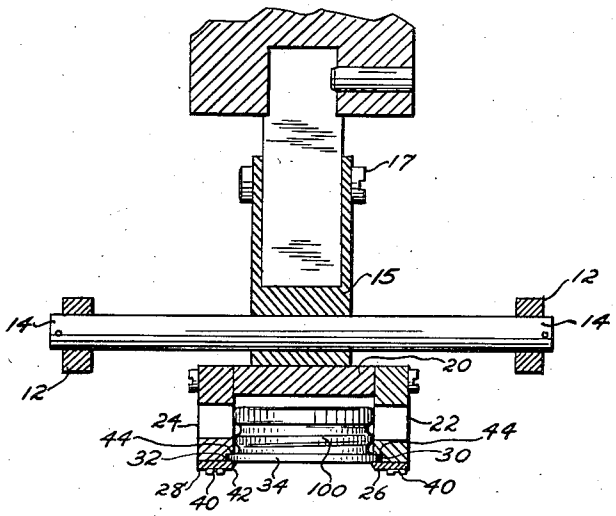


Fig. 2

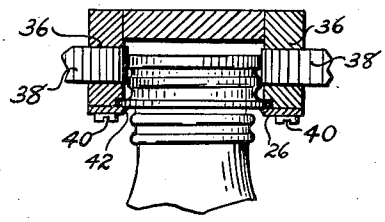


Fig. 4

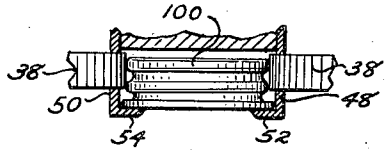


Fig. 3

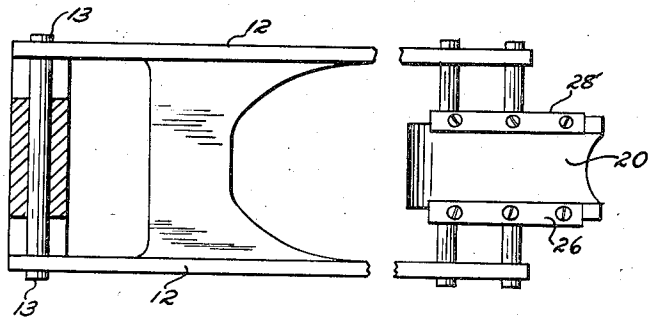


Fig. 5

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CONTAINER CAPPING MACHINES

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3 Claims. (Cl. 53—315)

This invention relates generally to the field of container capping machines, and more particularly to means for leveling caps disposed immediately above containers, prior to the seating of said caps upon said containers. The present invention has specific application to the container capping machine structure set forth in Patent No. 2,658,654, granted November 10, 1953, to Max Norman Schweitzer, and reference is made to our copending application, Serial No. 193,255, filed October 31, 1950, now Patent 2,732,991, for Container Capping Machine, the present invention relating to an improved structure of the same general class.

With machines of this type, wherein the containers and caps therefor travel at relatively high rates of speed, there is an occasional tendency for the caps to be seated on the openings of the containers in such a manner that the engageable threads of the cap and the opening in the container are not properly aligned. Since the containers and caps are moving at such speeds, this improper positioning cannot be corrected manually before the improperly capped container is ejected from the machine. It has been found that this difficulty occurs both in the threaded or screw-type cap, and the bayonet or lug-type cap. It is therefore among the principal objects of the present invention to provide structure by means of which substantially all possibility of the caps being positioned improperly has been eliminated.

Another object of the present invention herein lies in the provision of structure which will maintain each successive cap in a horizontal plane until the threads or lugs thereof have been sufficiently engaged with corresponding parts of the container to assure proper positioning thereof as the same is tightened.

Still another object of the present invention lies in the provision of structure of the class described, in which there is provided means for maintaining the cap in a horizontal plane irrespective of any vertical displacement of the cap during the tightening process.

A feature of the invention lies in the fact that the device may be adjusted for various types of caps ranging from those having a relatively flat shape, as is exemplified by the cap for mustard jars, and the like, as well as a relatively tall configuration exemplified by caps used in conjunction with catsup bottles, and the like.

Another feature of the invention lies in the provision of novel track means for use in conjunction with caps having a peripheral bead.

These objects and features, as well as other incidental ends and advantages, will become more clearly apparent during the course of the following disclosure, and be pointed out in the appended claims.

On the drawings, to which reference will be made in the specification, similar reference characters have been employed to designate corresponding parts throughout the several views.

Figure 1 is a fragmentary side elevational view of a first embodiment of the invention showing the device in position upon a capping machine.

Figure 2 is a vertical transverse fragmentary enlarged sectional view as seen from the plane 2—2 on Figure 1.

Figure 3 is a fragmentary sectional view of a second embodiment of the invention.

Figure 4 is a fragmentary vertical transverse sectional view corresponding to that seen on Figure 2, but showing cap engaging members in position for tightening the cap upon the container.

Figure 5 is a fragmentary horizontal sectional view, as seen from the plane 5—5 on Figure 1.

In accordance with the invention, the first embodiment of the device, generally indicated by reference character **10**, includes broadly: radius rod means **12** mounted upon a capping machine for pivotal movement about a point **13**, and connected by pin means **14** to a motion limiting member **15**. The limiting member **15** is provided with a slot **16** engageable by a screw member **17** which limits the upward and downward motion of the limiting member.

The leveling element **19** may be formed integrally with the limiting member **15**, and includes an upper support member **20**, side support members **22** and **24**, and lower support members **26** and **28**. Track members **30** and **32** are oppositely disposed and provide means for supporting successive caps in substantially horizontal position during the engaging of the same upon successive containers, generally indicated by reference character **60**. As may be seen on Figures 2 and 4, the caps **100** are provided with an annular bead **34** which is adapted to be disposed within the tracks **30** and **32**.

The side support members **22** and **24** are substantially similar, each being provided with elongated openings **36** through which annular cap engaging members **38** may project to engage the outer surface of the cap to rotate the same into engagement with the containers in the manner disclosed in the above-mentioned Patent No. 2,658,654.

The lower support members **26** and **28** may be of generally planar configuration, and are attached by screw means **40** to the lower surfaces of the support members **22** and **24**, the track members **30** and **32** being in effect formed by the cooperation of the lip portions **42** on the lower support members **26** and **28** with the rabbet portions **44** on the side support members **22** and **24**.

It will, of course, be understood that since the device **10** is essentially an attachment, it may be readily removed for substitution and/or replacement, the exact configuration of the cap carrying or engaging portions of the device depending upon the size and configuration of the cap employed. Where beaded caps of the type, indicated by reference character **100** are employed, the bead becomes guided by the track members in such manner that the upper and side support members serve a function only to support the track members, the track members providing all guiding functions.

Turning to the alternate embodiment shown on Figure 3, this embodiment differs from the principal embodiment in the elimination of the track, the cap being supported upon the lower guide members **52**, **54** and constrained thereupon by side guide members **48** and **50**.

Operation

In use, the operation of the capping machine is generally similar to that occurring when the device **10** is not employed. The cap chute **56** of the capping machine is adjusted to proper height by means of the set screw **58**, and the device is adjusted as to its lower limit of motion by means of the screw **17**. Containers **60** travel in a direction to the right as seen on Figure 1, and as they pass beneath the terminal portion **62** of the cap chute

56, each successive container 60 engages a cap 100, subsequent travel disengaging the cap 100 from contact with the retaining spring 64. Further travel to the right engages the cap 100 with the device 10, whereby the former may be leveled with respect to the container 60. If the cap 100 is properly aligned at the time of entrance into the device 10, the same will assume a position similar to that shown on Figure 2, wherein the cap may be rotated by the annular members. As the cap is engaged upon the containers, the same will normally travel in a downward direction, and this is permitted by the radius rods 12 under gravity. This motion will be a small segment of an arc, since the entire device is pivoting about an axis through the point 13, but owing to the great length of the radius rods 12, and the small arcuate movement (of the order of ⅜ of one inch), the movement may be considered to be substantially translational. Should the cap enter the device at an angle other than the proper angle, the track members 30 and 32 exert a camming action which serves to straighten or correct the angle, after which the cycle of operation is precisely the same as heretofore described. Subsequent travel to the right of the device (as seen on Figure 1) serves to eject the capped container 60 for transit from the capping machine. It is to be understood that the capping operation need not be fully completed by the time the container and cap leave the confines of the device 10. Subsequent completion may be accomplished by the annular members disposed to the rear of the capping machine, as shown by the above mentioned patent.

It may thus be seen that we have provided novel and useful improvements in container capping, in which a simple device assures the proper alignment of caps with respect to containers prior to and during the securing of the caps upon the containers. By virtue of the relatively low mass of the moving parts, and the low coefficient of friction under which they are movably mounted, the moving parts may quickly shift to accommodate changes in position of the caps, whereby they may pass through the device at a relatively high speed. Since container capping machines are frequently used with different runs using changed sizes of containers and caps, the disclosed constructions afford either adjustment to accommodate not only for the height and diameter of the cap, but for caps having internal and external threads, and for containers having neck rims of different dimensions. Where the caps employed are provided with beaded rims, the reciprocating structure may be skeletonized for still further reduction in weight. Depending upon the speed of operation, the device may incorporate springs (not shown) which urge it into proper position to align the caps with respect to the containers for quick and accurate engagement. Even though the cap is adequately supported and aligned, there is sufficient clear opening for access by the annular driving members which engage the caps to commence the rotational operation, or to complete the tightening of the caps upon the containers. Thus, the caps have their threads axially aligned with the threads of the container just prior to engagement and also during a sufficient portion of time until an ample portion of the threads are engaged so as to prevent tilting or jamming and assure trouble-free high-speed operation.

We wish it to be understood that we do not consider the invention limited to the exact details of structure

set forth in this specification, for obvious modifications will occur to those skilled in the art to which the present invention pertains.

We claim:

1. For use with container capping machine having means to feed a succession of caps and a succession of containers which meet at a capping location, and means for rotating said caps relative to said containers to threadedly engage the same upon said containers, a device for aligning the caps with respect to the containers as the caps are threadedly engaged, said device comprising: a support means fixedly arranged with respect to said capping machine, a leveling element, radius rod means movably interconnecting said leveling element with respect to said support means; said leveling element being movable through a substantially translational path of movement, and including an upper support member, and a pair of spaced side support members having oppositely disposed track means thereon in which said caps are successively and slidably engageable; whereby said caps may be maintained in substantially level position as the same are threadedly engaged upon said containers.

2. For use with a container capping machine having means to feed a succession of caps and a succession of containers which meet at a capping location, and means for rotating said caps relative to said containers to threadedly engage the same upon said containers, a device for aligning the caps with respect to the containers as the caps are threadedly engaged, said device comprising: a support means fixedly arranged with respect to said capping machine, a leveling element, radius rod means movably interconnecting said leveling element with respect to said support means; said leveling element being movable through a short arcuate path of motion, and including an upper support member, and a pair of spaced side support members having oppositely disposed track means thereon in which said caps are successively and slidably engageable; whereby said caps may be maintained in substantially level position as the same are threadedly engaged upon said containers.

3. For use with a container capping machine having means to feed a succession of caps and a succession of containers which meet at a capping location, and means for rotating said caps relative to said containers for threaded engagement, a device for aligning the caps with respect to the containers as the caps are threadedly engaged therewith, said device comprising: a support means fixedly arranged with respect to said capping machine; a leveling element; radius rod means movably interconnected at the first end thereof to said leveling element, and at a second end thereof to said support means; said leveling element being movable through a plurality of substantially parallel planes, and including an upper support member, a pair of spaced side support members and a pair of lower support members associated with said side support members; said caps being adapted to pass between said side support members and rest upon said lower support members for being maintained in substantially horizontal alignment prior to and during engagement with said containers.

References Cited in the file of this patent

UNITED STATES PATENTS

2,732,991 De Bastos et al. _____ Jan. 31, 1956