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2,669,142

CAM OPERATED SLIDING JAW CLOSURE REMOVER

Filed July 28, 1952

3 Sheets-Sheet 1

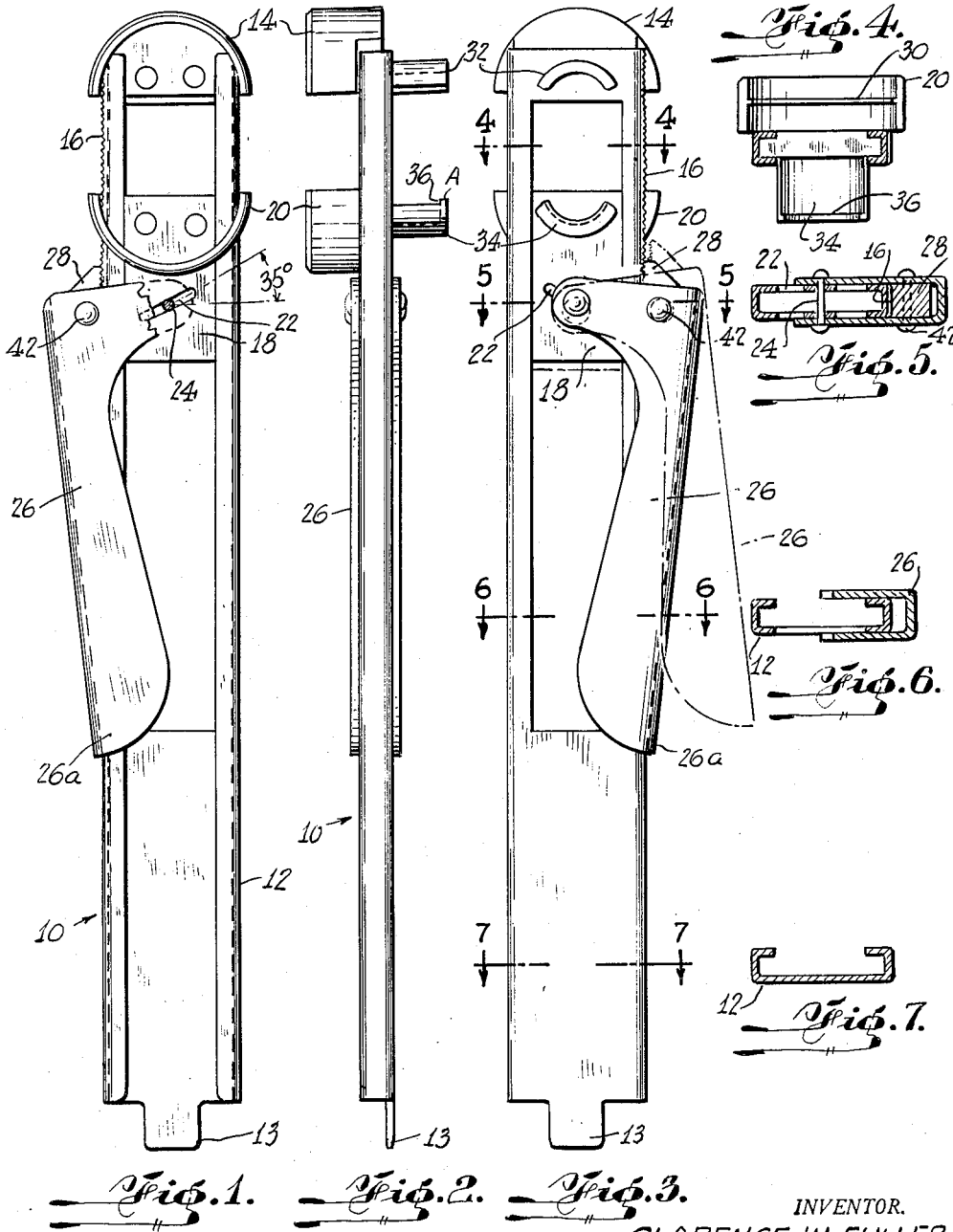


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

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3 Sheets-Sheet 2

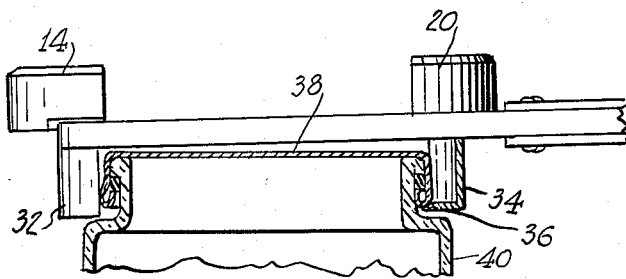
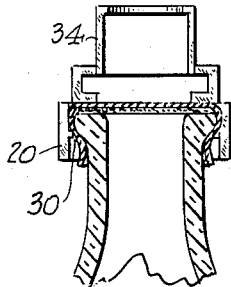
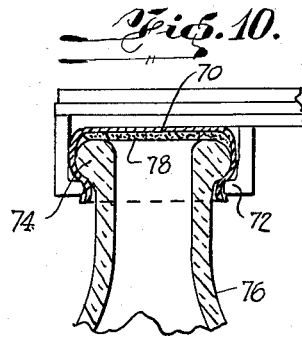
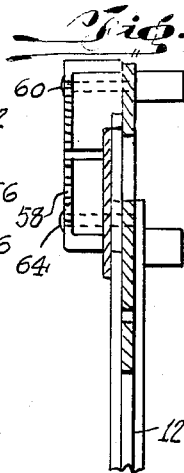
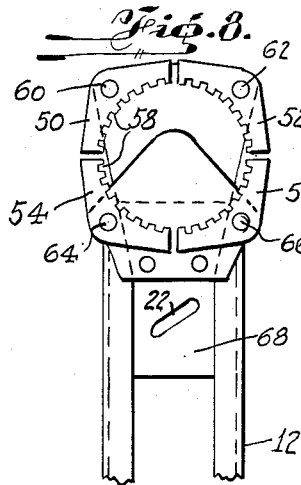
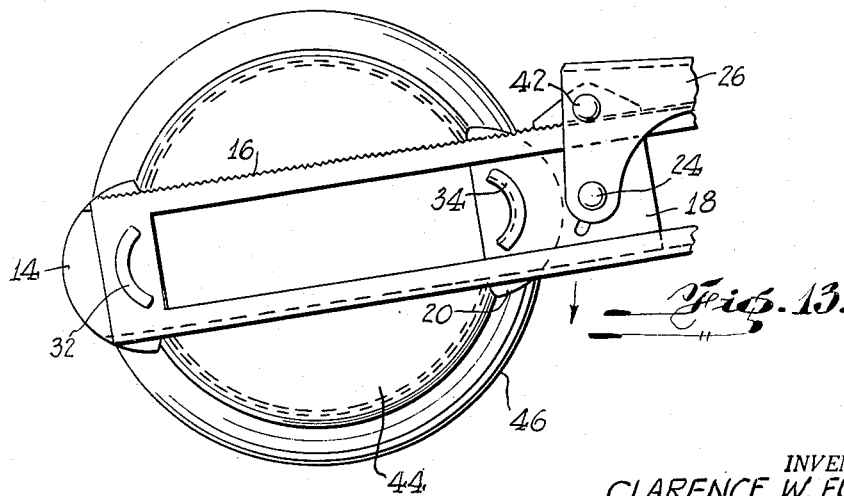


Fig. 11.

Fig. 12.



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3 Sheets-Sheet 3

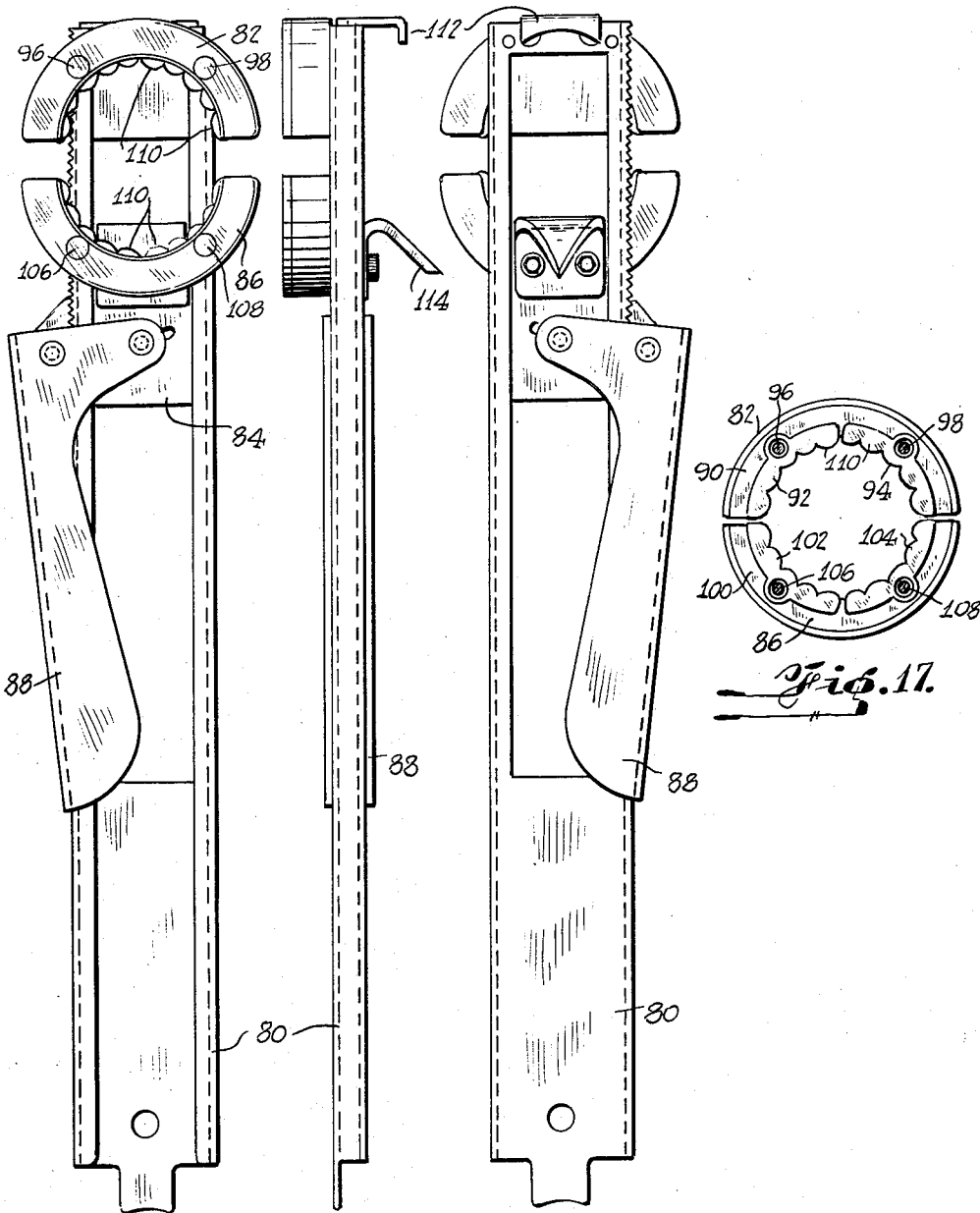


Fig. 14. Fig. 15. Fig. 16.

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CAM OPERATED SLIDING JAW CLOSURE REMOVER

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2 Claims. (Cl. 81—3.42)

1 This invention relates to a jar and bottle cap opener and sealer.

The device herein described and claimed performs many important functions: In the first place, it serves as an opener for screw-type and snap-type caps and covers for jars, bottles and the like. It is immaterial how large or how small these caps and covers may be, and it is immaterial what their shape may be, they are all readily accommodated by the opener constituting the present invention. By the same token, this opener may be employed to re-secure the screw caps and crown seal caps and covers back upon their respective bottles and jars so as to provide a secure, air-tight and liquid-tight seal. The third important function of this device is to remove crown caps from beer bottles and bottles of other carbonated water and beverages, and the like. This is done without seriously distorting the caps. The fourth important function is to refasten crown caps to beer bottles, carbonated water bottles, and the like. The caps which this device removes from these bottles may be re-applied to them time and time again, and on each occasion a perfect seal will be effected.

It is accordingly the principal object of this invention to provide a combination jar and bottle cap opener and sealer which not only removes the caps from their respective jars and bottles but also replaces certain of them thereon in substantially as good condition as they were in prior to removal.

Another important object of this invention is the provision of a combination opener and sealer of the character described which is readily adjustable to caps and covers of virtually every conceivable size and shape, and which readily locks upon said caps and covers by the movement or actuation of a single lever. This device comprises a pair of clamping jaws which are movable relative to each other and clamping means for locking them in position relative to each other. The clamping means include a pivoted lever which is connected to one of said jaws, a pin and cam slot construction associated with said lever and said jaw, a toothed member connected to the second jaw and a second toothed member which is connected to the lever for movement into and out of engagement with the first toothed member. When the lever is in one position, the toothed members are free from each other and the two jaws are thereby free to move relative to each other. When the lever is swung toward the second position, the toothed members engage each other to prevent relative move-

2 ment therebetween and the pin acts on the cam slot to thrust the first-mentioned jaw toward the second-mentioned jaw. When the lever reaches its second position, the two jaws are locked in position relative to each other.

There are other important features, including the simplicity of construction which makes for mass production and low cost.

Another feature is a pry-up member on the handle of this device for prying up friction-type covers commonly used on vacuum-sealed jars, bottles and the like.

In a modification of this invention, four pivotal jaw segments are provided and they are all movable relative to each other. There are really two pairs of segments, each pair consisting of two pivotally-mounted segments which are free to pivot relative to each other, within reasonable limitations. The two pairs of segments are also slidably movable toward and away from each other. The use of these pivoted segments renders it possible to adjust the device herein claimed to the various sizes and shapes of jar and bottle caps and to lock them securely thereon without damaging them.

In another form of this invention, the four jaw segments are shaped differently from the segments above mentioned and they are provided with an additional range of movement. More specifically, the segments of the first modification are provided with substantially rectangular teeth which are adapted to engage the sides of jar and bottle caps and to compress them for sealing purposes. In the second modification embodying movable segments, the teeth are rounded to fluted or corrugated shape. They are so shaped and spaced so as to enter the valleys between the ridges on the skirts of crown caps. The sides and valleys of the tool teeth tend to depress the ridges of the cap, and the teeth of the tool act as stops to prevent the base or bottom of the cap valleys from buckling out. This is quite important for re-sealing crown caps on soda and beer bottles and the like. The segments are slidably and pivotally movable relative to each other and a lost motion is also provided so that they may adjust themselves or compensate for irregularities in the jar and bottle caps.

Preferred forms of this invention are shown in the accompanying drawings, in which:

Fig. 1 is a face view of a combination jar and bottle cap opener and sealer made in accordance with one form of this invention.

Fig. 2 is a side edge view thereof.

Fig. 3 is a view of the back of said device.

Fig. 4 is a section on the line 4—4 of Fig. 3.

Fig. 5 is a section on the line 5—5 of Fig. 3.

Fig. 6 is a section on the line 6—6 of Fig. 3.

Fig. 7 is a section on the line 7—7 of Fig. 3.

Fig. 8 is a fragmentary face view of a jar and bottle cap opener and sealer made in accordance with a second form of the invention.

Fig. 9 is a side view thereof, partly in section.

Fig. 10 is a fragmentary view in section of the type of a bottle, showing the device herein claimed used as a cap sealer to fasten a crown cap to said bottle.

Fig. 11 is a similar view showing the clamping means by which the apron of the crown cap is pulled tight over the lip or bead of the bottle.

Fig. 12 is a fragmentary view in section of a jar having a friction-type cap or cover, showing how said cap or cover may be pried off said jar by the device herein claimed.

Fig. 13 is a fragmentary bottom view of what is shown in Fig. 12.

Fig. 14 is a view similar to that of Fig. 1, showing another form of this invention.

Fig. 15 is a side edge view thereof.

Fig. 16 is a back view of the device shown in Fig. 14.

Fig. 17 is a view of the jaws of said device with the cover plate removed.

Referring now to the first seven figures of the drawing, it will be seen that the cap opening and sealing device 10 comprises the following component parts: a handle 12 having a pry-up tongue 13 at one end, a clamping jaw 14 fixed to the opposite end of the handle, a plurality of teeth or serrations 16 formed along one side of said handle, a slide 18 mounted in said handle for slidable movement longitudinally thereof toward and away from clamping jaw 14, a second clamping jaw 20 fixed on said slide, a cam slot 22 formed in said slide, a pin 24 which projects through said slot and serves as a cam follower relative thereto, a bell crank shaped lever 26 which supports said pin, and a toothed dog 28 which is also supported by said lever for movement with said lever into and out of engagement with teeth 16 on the side of the handle.

Clamping jaws 14 and 20 are arcuate in shape and their concave sides face each other. Both said clamping jaws are provided with an arcuate bead 30 which is employed for sealing purposes. (See Fig. 4). It will be noted that a second pair of jaws 32 and 34 are secured, respectively to the backs of clamping jaws 14 and 20. Jaws 32 and 34 are also arcuate in shape, their concave sides facing each other. One of said jaws is provided with an arcuate lip 36 which may be used for prying up friction-type caps such as cap 38 on jar or bottle 40 (see Fig. 12) and crown caps such as are used on bottles of charged water, beer, etc.

It will be noted in Fig. 1 that cam slot 22 is intersected by an axial line extending longitudinally of handle 12 and that said slot is disposed at an angle of approximately 55° relative to said axial line. (The drawing shows the angle as 35° between the slot and a transverse line erected perpendicular to the longitudinal axis.) The relative movement of the two clamping jaws also takes place along said axial line and hence it will be understood that the cam slot extends at an angle of 55° with respect to said line of movement. This angle, however, is not critical and may be varied to meet necessary conditions. Lever 26 is folded over to accommodate handle 12 as seen in Fig. 5, and also to accommodate the

toothed dog 28. A pin or rivet 42 pivotally secures said dog to said lever. This pin or rivet serves as a fulcrum for the lever, particularly when the toothed dog is in engagement with teeth 16. Pin 24 also, at times, serves as a fulcrum for lever 26. Pin 24 is disposed at one end of the lever, pin 42 is disposed at its corner or elbow, and the opposite end 26a of the lever serves as a handle by which the lever may be swung from one angular position to another as shown in Fig. 3. When the lever is in its broken line position, dog 28 is out of engagement with teeth 16 and hence the lever and slide 18 are free to move in either direction longitudinally of handle 12. When the lever is swung toward its solid line position as shown in Fig. 3, the toothed dog enters into engagement with teeth 16 and the lever is thereby prevented from moving longitudinally of handle 12. Slide 18 remains, however, free to move a predetermined distance longitudinally of handle 12 and toward clamping jaw 14. This movement takes place by reason of the action of pin 24 upon the sides of cam slot 22.

In the use of this device, clamping jaws 14 and 20 are made to engage a cap or cover 44 on jar or bottle 46 as shown in Fig. 13. The lever is in its broken line position as shown in Fig. 3, and the slide and handle are moved in the direction of clamping jaw 14 until the two jaws are in engagement with said cap or cover. The lever is then swung toward handle 12 and the dog is thereby brought into engagement with the teeth on said handle. Further movement of the lever in the same direction causes the cam follower 24 to exert a camming action or force upon slide 18, thereby forcing said slide to move a predetermined distance toward clamping jaw 14. The angle at which cam slot 22 is disposed relative to the axial movement of said slide helps determine the extent of such cammed movement of said slide. Since clamping jaw 20 is secured to said slide, the effect of such camming action is to cause the two clamping jaws to securely engage the cap or cover of the jar.

Figs. 8 and 9 show a construction similar to the device above described except that one pair of its clamping jaws are segmented, toothed and pivotally mounted. More specifically, clamping jaw segments 50 and 52 correspond to clamping jaw 14. All four jaw segments are made identically and each one has a concave portion with teeth 58 formed thereon. The concave portions of all of these jaw segments face each other to form a circle when the jaw segments are brought together to their Fig. 8 positions. It will be noted that jaw segments 50 and 52 are pivotally secured by means of pins 60 and 62 to handle 12. It will also be noted that jaw segments 54 and 56 are pivotally secured by means of pins 64 and 66 to slide 68 which corresponds to slide 18 above described.

The mechanism above described is employed in precisely the same way when it is desired to make use of jaws 32 and 34. Jaws 32 and 34 are brought into engagement with a friction type cap or cover 38 and lip 36 is inserted under said cap or cover so that it may be pried off. The lip 36 may also be inserted under the apron or skirt of a crown seal cap to pry it off.

When it is desired to replace a crown cap 70 which is removed from a bottle by means of jaws 32 and 34, either the jaws 14 and 20 or the jaw segments 50, 52, 54, and 56 are employed. (See Figs. 10 and 11.) It will be noted that the jaw

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segments are provided with inwardly extending projection or projections 72 which engage the crests of the corrugated apron of the crown cap, below bead 74 of bottle 76. Clamping jaw 20 is provided with a bead 30 or any similar bead which engages that portion of the apron of the crown cap which is disposed adjacent the lower portion of the said bottle head 74. The pressure of bead 30 upon the crests of the corrugated apron of the crown cap forces said crown cap downwardly upon the bottle so as to provide a tight seal between the cork liner 78 of the cap and the top of the bottle.

Referring to Figs. 14, 15, 16 and 17, it will be seen that a handle 80 is provided which corresponds to handle 12 of the first form of this invention, a clamping jaw 82 corresponding to clamping jaw 14 being secured to one end of handle 80, a slide 84 corresponding to slide 18 being mounted for longitudinal movement in said handle, a second clamping jaw 86 corresponding to jaw 20 being secured to slide 84 and a lever 88 corresponding to lever 26 being connected to slide 84 and to handle 80 by the same means which connects lever 26 to slide 18 and handle 12. It will be noted in Fig. 17 that jaw 82 comprises an arcuate frame member 90 having a pair of jaw segments 92 and 94 pivotally secured thereto by means of pins 96 and 98. These pins project through oversized holes in jaw segments 92 and 94 so as to provide for lost motion between said jaw segments and said arcuate member. Similarly, clamping jaw 86 comprises an arcuate frame member 100 and a pair of jaw segments 102 and 104 pivotally secured thereto by means of pins 106 and 108 respectively. These pins also project through oversized holes in jaw segments 102 and 104.

In operation, the present device corresponds to the operation of the device shown in Fig. 8. As has already been indicated, however, jaws 82 and 86 are provided with rounded teeth 110 which are shaped and spaced to fit the skirts of crown caps. This makes for a superior clamping action for re-sealing such caps on soda and beer bottles and the like. The edges of the jaws 86 are well adapted to engage the sides of other caps either to remove them or to replace them without causing them injury.

On the opposite side of the handle from clamping jaws 82 and 86 are a hook-shaped member 112 and a punch 114. The hook-shaped member is secured to the same end of the handle as clamping jaw 82, but on the other side thereof. Punch 114 is secured to slide 84 on the opposite side of said slide from clamping jaw 86. The hook-shaped member is adapted to hook under crown caps, jar caps and the like and these caps may be removed from the bottles or jars to which they are connected by simply tilting the handle and using it as a lever. The caps would thereby be pried or lifted off their respective bottles or jars.

Hook 112 may also be brought into engagement with the peripheral bead of a can, such as is conventionally used in connection with beer, fruit juices, evaporated milk and the like. It would then serve as a fulcrum for the handle and the handle could then be used to press punch 114 into the top wall of the can. The point of the punch would, of course, be brought immediately adjacent that part of the bead of the can which lies diametrically opposite that por-

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tion of the bead which the hook engages. It will be seen that the punch is triangular in shape and when it pierces the top wall of the can it forms a triangular opening whose apex lies immediately adjacent the bead of the can. An unusually good pouring spout or opening is thereby provided.

The foregoing is illustrative of preferred forms of this invention. It will clearly be understood that these preferred forms may be modified and other forms may be provided within the broad spirit of the invention, as set forth in the appended claims.

One such modification, for instance, would be the omission from the handles of teeth 16. In this case the teeth on dog 28 would bite into the surface of the handle against which it engages and thus perform the necessary function as above described.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A jar and bottle cap opener of the character described, comprising a handle of C-shaped cross section providing opposed longitudinal guide grooves, a clamping jaw fixed to one end of the handle, a plurality of teeth formed along one outer edge of the handle, a slide which is mounted within said guide grooves on said handle for sliding movement toward and away from the clamping jaw, a second clamping jaw fixed to said slide, said first and second clamping jaws being complementary to each other, a cam slot formed in said slide, said jaws being relatively movable toward and from each other on an axial line which intersects the cam slot, said cam slot being disposed at an angle of approximately 55° relative to said axial line, a cam follower engaging said cam slot, a bell-crank-shaped lever, one end of said lever constituting a handle, the opposite end of said lever supporting said cam follower and a toothed dog which is secured to the intermediate portion of said lever for movement with said lever into and out of engagement with the teeth of the first-mentioned handle.

2. A jar and bottle cap opener in accordance with claim 1 wherein each clamping jaw comprises a pair of pivotally mounted jaw segments which are independently movable relative to each other, each said pivoted pin being engaged in an oversized hole to allow for limited lateral movement of each segment relative to its jaw, and each segment having a concave side which is provided with a plurality of rounded teeth, and which faces the corresponding round toothed concave sides of the other segments.

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