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3,180,068

WASHING AND SEALING MACHINE

Filed April 12, 1962

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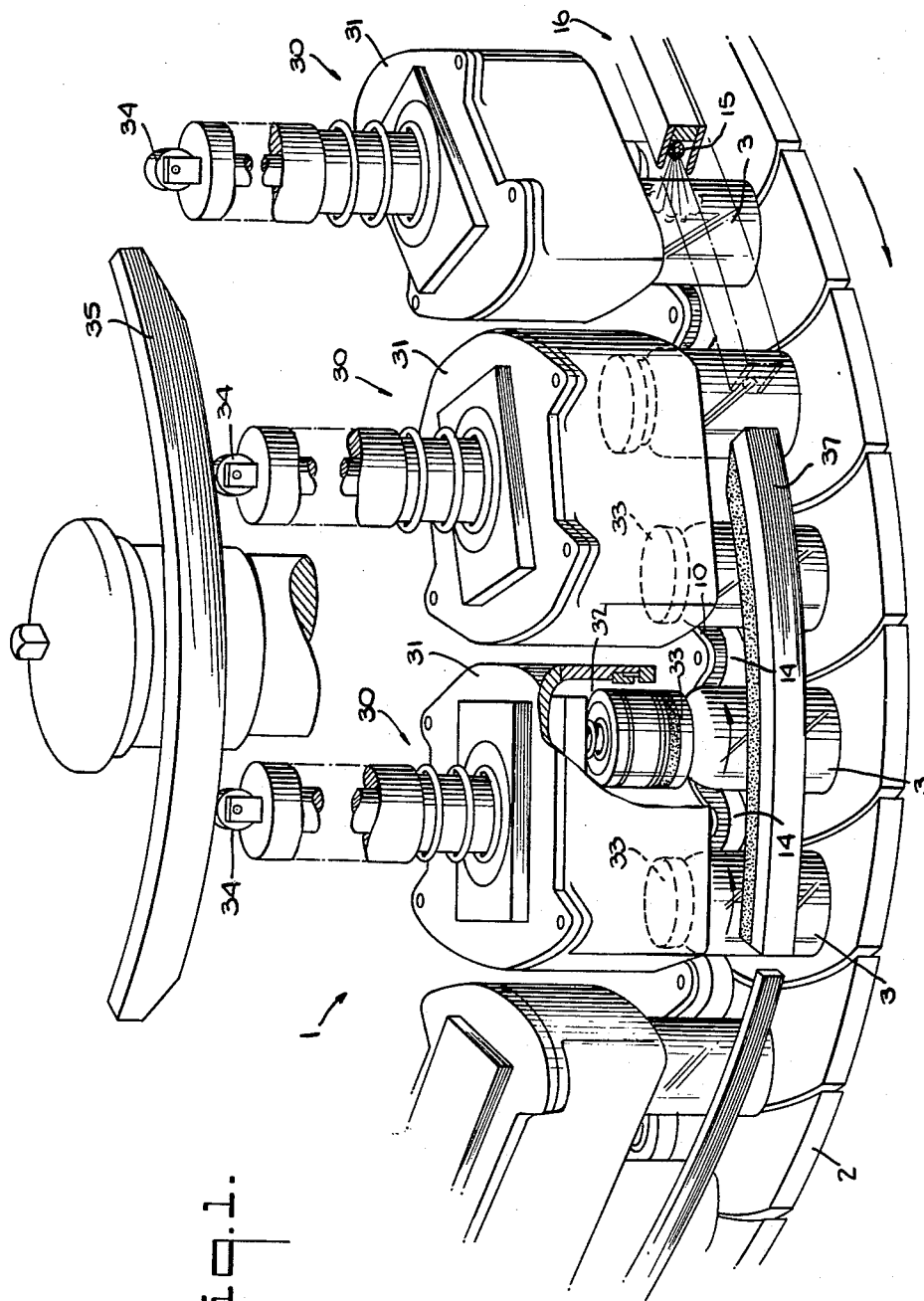


Fig. 1.

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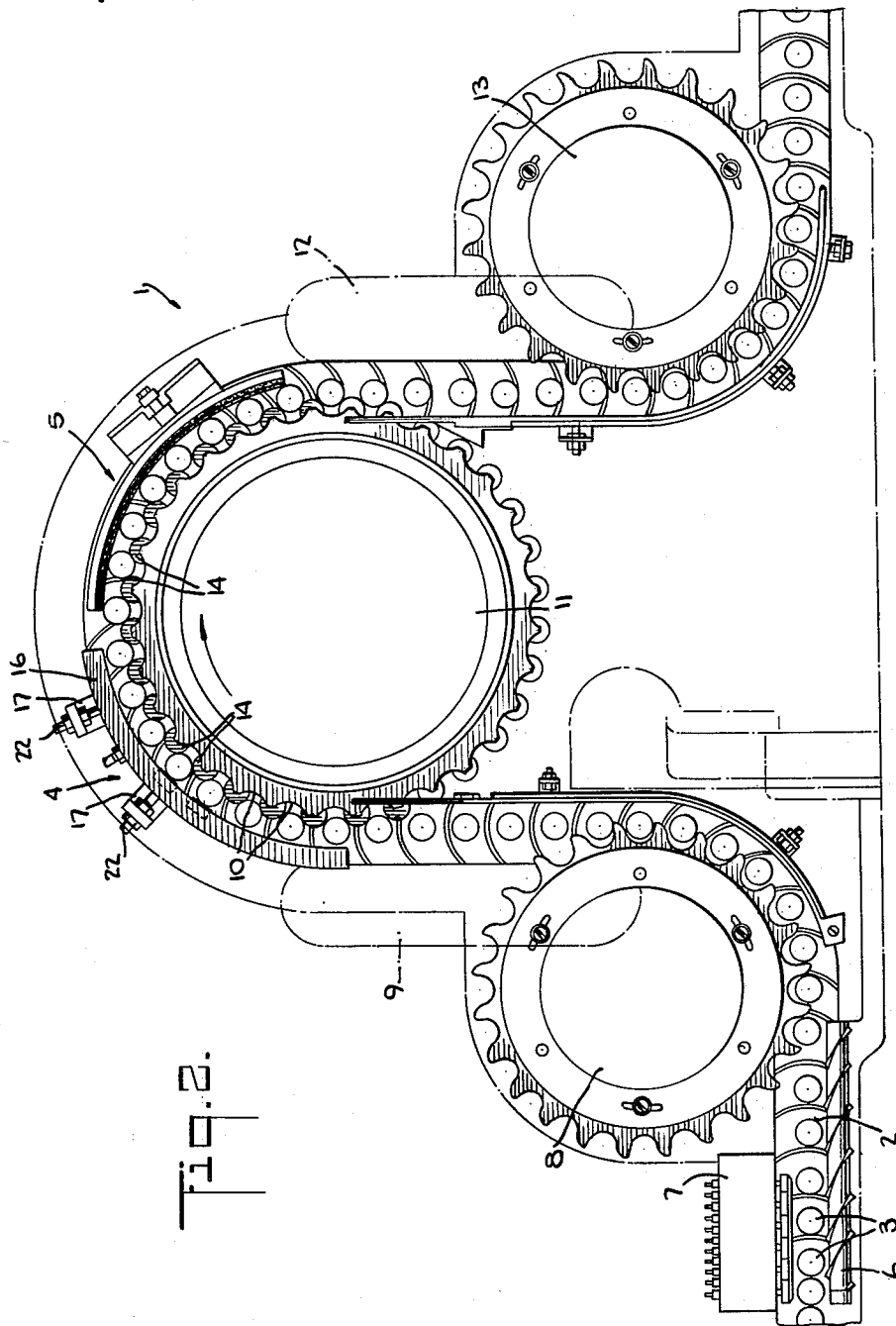


Fig. 2.

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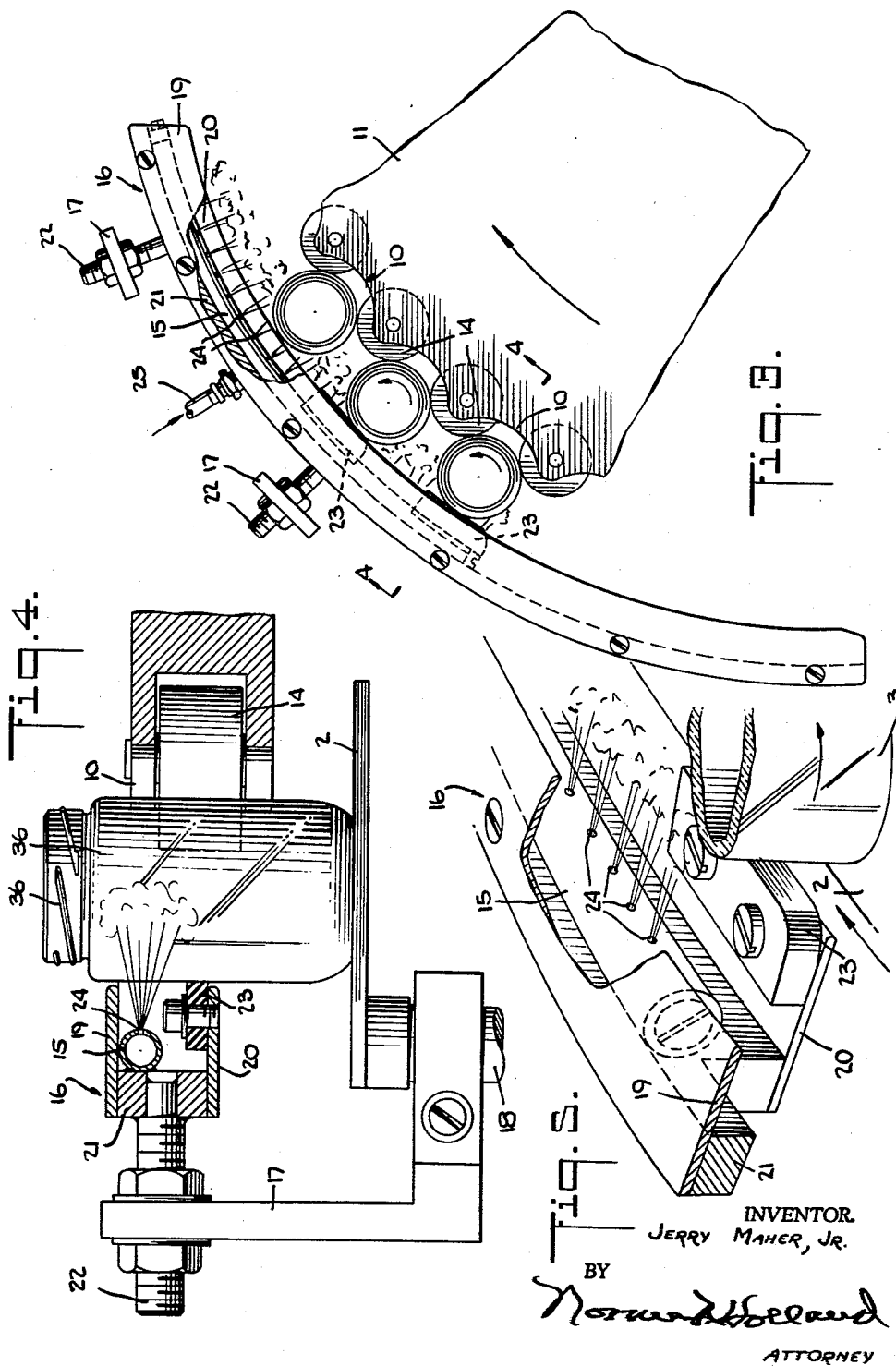
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WASHING AND SEALING MACHINE

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2 Claims. (Cl. 53-167)

The present invention relates to the sealing art and more particularly to a combined washing and sealing machine in which the washing mechanism is an integral part of a container sealing mechanism whereby the containers are washed immediately prior to the sealing operation.

In automatic sealing machines containers are sealed by closure caps, which may be of the screw type or the press-on type. In prior sealing machines, containers are moved from a packaging machine where they are filled with a product to a container washing machine which washes the containers. Then the washed containers are placed in a sealing machine, at which time closure caps are applied thereto. Thereafter the containers may again be washed on a separate washing mechanism. The sealing machine is usually a separate machine and the containers are physically moved from one machine to the other. This is a time consuming operation and is impractical in fully automatic machinery.

The present invention overcomes these drawbacks and has for one of its objects the provision of an improved combined washing and sealing machine whereby the containers are washed immediately before or after the sealing operation without the necessity of moving them out of line.

Another object of the present invention is the provision of an improved combined washing and sealing machine which will eliminate the necessity of moving containers from one mechanism to another and which will wash a container in a continuous operation.

Another object of the present invention is the provision of an improved container washing mechanism which will wash the full circumference of a container as it moves past the washing mechanism.

Another object of the present invention is the provision of an improved container washing mechanism whereby the containers are rotated as they move past the jar washing means.

Another object of the present invention is the provision of an improved container washing mechanism which is integral with a sealing mechanism.

Another object of the present invention is the provision of an improved combined washing and sealing machine which is simple to operate and inexpensive to maintain.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a perspective view showing the combined sealing and washing mechanism of the present invention in operation;

FIG. 2 is a plan view of the improved combined washing and sealing machine shown in FIG. 1;

FIG. 3 is a detail of the washing mechanism of the present invention;

FIG. 4 is a sectional view taken along line 4-4 of FIG. 3; and

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FIG. 5 is an enlarged perspective detail showing the washing mechanism in operation.

As shown in FIGS. 1 and 2, the combined washing and sealing machine is designated generally by the reference numeral 1 and comprises a horizontally disposed endless conveyor means 2 which receives filled and unsealed containers 3 at a loading point (not shown) and which carries the containers 3 past a washing mechanism, designated generally by the reference numeral 4, which washes the containers and a sealing mechanism, designated generally by the reference number 5, which applies a closure cap to the containers and discharges the containers 3 at a discharge station (not shown).

Referring to FIG. 2, the conveyor means 2 first carries the filled containers 3 to a suitable spacing mechanism which may be a helicoid or rotating screw 6. A bumper mechanism 7 is adapted to move the containers 3 against the helicoid 6 in order to permit them to be properly spaced. The containers 3 are then moved past a feeding star wheel 8 which feeds them to a suitable guide 9 (shown in broken lines) which in turn directs the containers 3 into pockets 10 of a rotating turret 11. The pockets 10 are provided with rollers 14 to receive the containers 3 and permit them to rotate, as will be more fully discussed hereinafter. The turret 11 moves the containers 3 past the washing mechanism 4 which washes the containers 3 and then past the sealing mechanism 5 which applies a closure cap thereto. The sealed containers 3 are then moved to an exit guide 12 (shown in broken lines) and to an exit star wheel 13 which moves the sealed containers 3 to a discharge station.

As shown more fully in FIGS. 1 and 3 to 5, the washing mechanism 4 comprises an elongated conduit or hose 15 mounted in a housing 16 which is affixed to a plurality of brackets 17 extending from the frame 18 of the machine 1. The hose 15 has a plurality of openings 24 adapted to eject a washing fluid against the containers 3. The washing fluid is supplied to the hose 15 from a source (not shown) by a suitable conduit 25.

The housing 16 comprises an upper wall 19, a lower wall 20 and a rear wall 21 to which the hose 15 is affixed. The rear wall 21 has a plurality of bolts 22 extending therefrom and threadably mounted in brackets 17 which permits the washer housing 16 to be adjusted relative to containers 3 in the turret 11 and thus enables containers of different diameters to be washed by the same mechanism.

A plurality of resilient shoes 23, which are preferably made of rubber, are mounted on the lower wall 20 of the housing and extend therebeyond so that they bear against the containers 3 passing thereby. As the containers move through the washing mechanism 4 they strike the rubber shoes 23 which moves the containers snugly against rollers 14. Friction permits the containers 3 to rotate against the rollers 14 in the pockets 10 of the turret 11. In the meantime, washing fluid is being ejected through the openings 24 of the hose 15 against the containers 3 to wash the containers. Since the containers 3 are rotating and being bodily moved past the washing mechanism 4, the complete outer periphery of the containers will be washed in a continuous operation.

After the containers 3 are thoroughly washed by the washing mechanism 4, the containers are moved to the sealing mechanism 5. The sealing mechanism 5 shown in this application is more fully described in co-pending application Serial No. 840,150 filed September 15, 1959, now Patent No. 3,073,090. It will be understood that other sealing mechanisms may also be used and that the present invention is not limited to the particular sealing mechanism shown.

The sealing mechanism is shown in detail in FIG. 1 and comprises a plurality of sealing heads 30 each having

a hood 31 mounted on its lower end with a pair of sealing chucks 32 depending therefrom and mounted within the hoods 31.

The sealing chucks 32 are adapted to receive closure caps 33 from a suitable closure feed (not shown) and to hold the closure caps in place by any suitable means, such as, by a magnet (not shown) in the chucks 32.

After the sealing heads 30 are positioned above the moving containers 3 on the conveyor means 2, the hoods 31 on the lower ends of the sealing heads 30 are lowered over the mouths of the containers 3 to permit the injection of steam or an inert gas into the headspaces of the containers 3 to form a vacuum or an inert atmosphere in the headspace of the sealed containers.

A roller 34 on the top of each of the sealing heads 30 cooperates with a sealing cam 35 thereabove to lower the sealing chucks 32 of the sealing heads 30 so that the lugs or threads (not shown) on the closures 33 engage the threads or lugs 36 (FIG. 4) on the containers 3. Simultaneously, the side walls of each of the containers 3 engage an elongated container rotating shoe 37 mounted outwardly of the turret 11. The shoe 37 engages each of the containers 3 and simultaneously holds it against the rollers 14 and causes the containers 3 to rotate about its vertical axis due to the frictional engagement of the shoe 37 with the side walls of each container 3. The simultaneous lowering of the closure caps 33 and the rotation of the containers 3 causes the containers 3 to be turned into sealing engagement with the closures to seal the containers to be sealed.

While the present invention has been described in connection with a machine for first washing the containers and thereafter applying a cap thereto, it will be understood that it is within the scope of the present invention to provide a machine which first applies a closure cap to the containers and thereafter washes them.

It will thus be seen that the present invention provides an improved washing mechanism whereby all the containers are washed in a continuous operation immediately prior to the sealing operation without the necessity of moving the containers from one unit to another. The present invention also provides a washing mechanism which is an integral part of a sealing mechanism to give a faster and more efficient operation.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

The invention having thus been described, it is claimed:

1. A container handling mechanism comprising means for moving containers in an arcuate path, means along said arcuate path for first washing containers moving thereby, said washing means comprising a continuous elongated arcuate tube having a plurality of openings for directing a washing medium against containers passing thereby, said elongated tube being mounted in a housing movable relative to said container moving means in a radial direction, cap applying means along said arcuate path for applying closure caps to containers passing thereby, said cap applying means being adjacent to said washing means, said movable housing being on one side of said path, a turret mounted to rotate adjacent said path on the other side thereof, said turret being provided with a pair of rollers adapted to receive a container, a resilient shoe extending from said housing toward said path, said shoe being adapted to frictionally engage a container passing thereby to cause it to rotate.

2. A container handling mechanism comprising means for moving containers in an arcuate path, means along said arcuate path for first washing containers moving thereby, said washing means comprising a continuous elongated arcuate tube having a plurality of openings for directing a washing medium against containers passing thereby, said elongated tube being mounted in a housing movable relative to said container moving means in a radial direction, cap applying means along said arcuate path for applying closure caps to containers passing thereby, said cap applying means being adjacent to said washing means, said movable housing being on one side of said path, and a resilient shoe extending from said housing toward said path, said shoe being adapted to frictionally engage a container passing thereby to cause it to rotate.

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