

# United States Patent

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 [33] **Great Britain**  
 [31] **54,903/69**

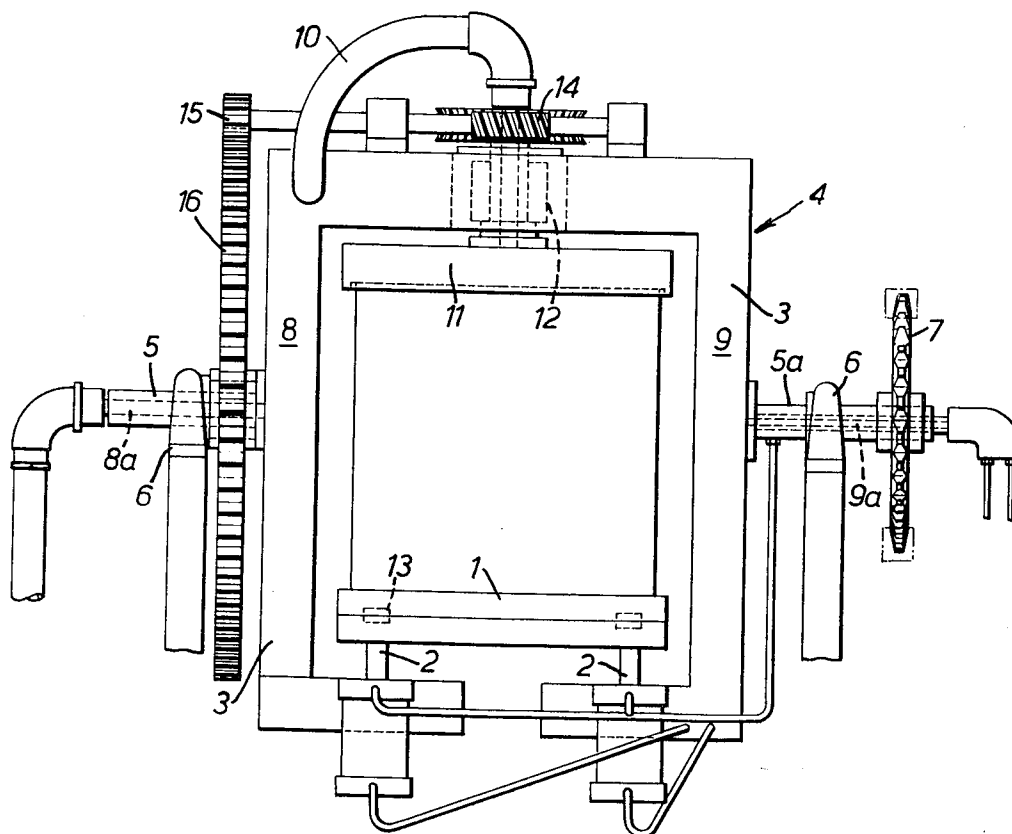
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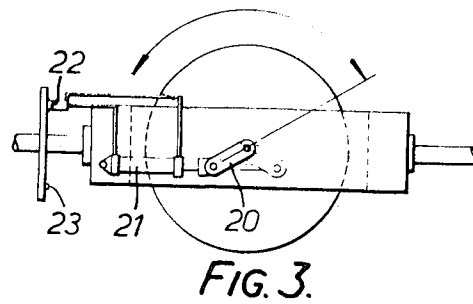
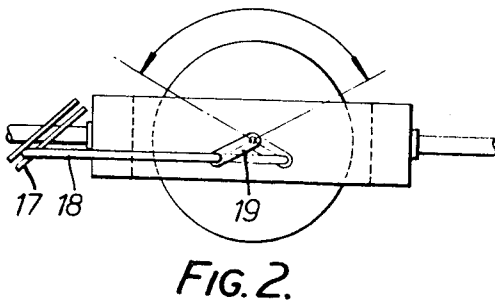
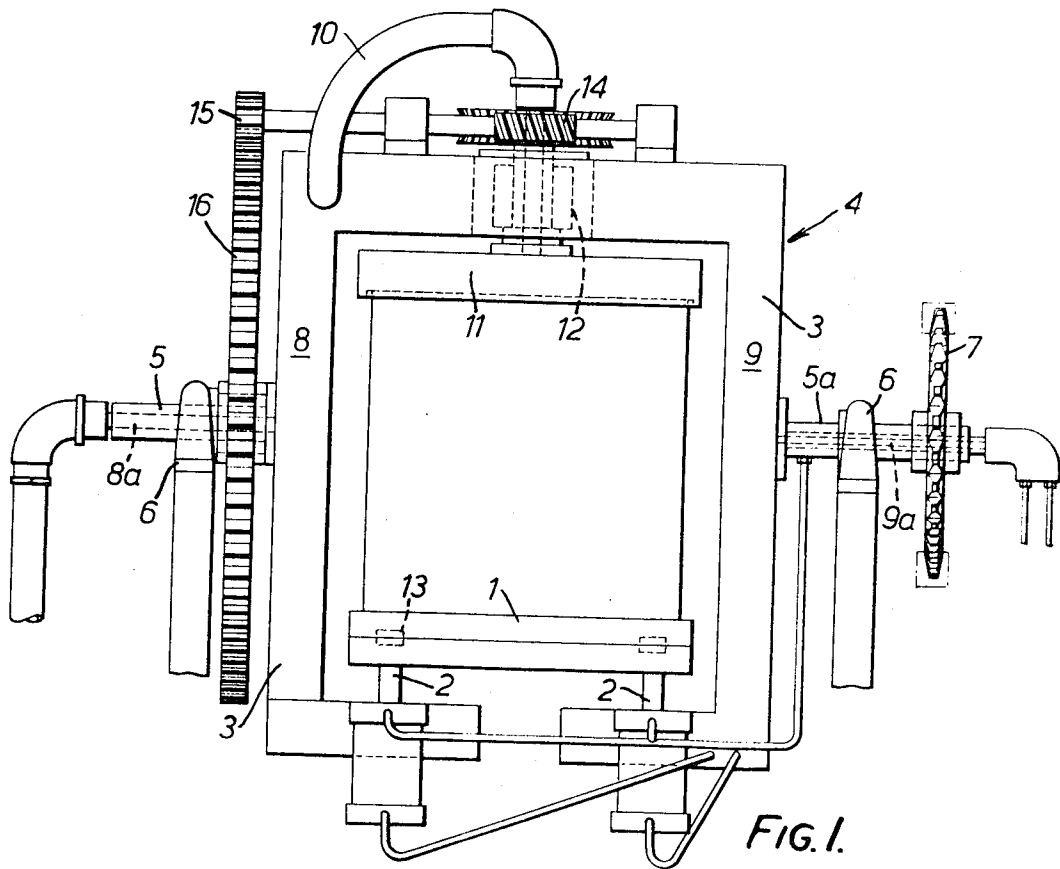
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[54] **MACHINES FOR PROCESSING ARTICLES**  
**5 Claims, 3 Drawing Figs.**

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**134/150, 134/161**  
 [51] Int. Cl. .... **B08b 3/04**  
 [50] Field of Search. .... **134/117-121,**  
**150, 155, 161**

**ABSTRACT:** A machine for processing articles in a container comprising a rotatable frame, a pair of container engaging members carried by the frame and themselves rotatable about an axis normal to the frame rotational axis and drive means to effect simultaneous movement of a container about both axes while exposed to processing liquid fed to the container.





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## MACHINES FOR PROCESSING ARTICLES

This invention is concerned with improvements in and relating to machines for processing articles.

In United Kingdom Letters Patent No. 1097698 there has been described a machine for processing articles in open containers by means of a fluid, the machine comprising a housing, conveyor means to convey each container into and out of the housing, at least one member within the housing arranged to engage the container opening to retain the articles within the container, means to rotate the engaged container and member about a substantially horizontal axis, and means to pump the fluid through the container during such rotation.

The motion of the container about a horizontal axis will cause the parts to be processed to tumble in the container and be exposed to the processing liquid. It is an object of this invention to increase the efficiency of the machine in effecting such exposure and according to this invention there is provided a machine for processing articles in open containers by means of a fluid, the machine comprising a housing, conveyor means to convey each container into and out of the housing, at least one member within the housing arranged to engage the container opening to retain the articles within the container, means to rotate the engaged container and member about two mutually perpendicular axes at least one of which is horizontal, and means to pump the fluid through the container during such rotation.

In order that the invention may be well understood there will now be described some embodiments thereof, given by way of example only, reference being had to the accompanying drawing in which:

FIG. 1 is a diagrammatic elevation of a container receiving part of the machine, and

FIGS. 2 and 3 are detail views of alternate driving means.

The machine has any suitable form of feed-in and feed-out mechanism for the tote boxes to deliver them to and withdraw them from a platform 1 carried by a pair of jacks 2 mounted adjacent the foot of each of two legs 3 of a frame 4. The frame is pivoted by way of stub shafts 5, 5a in bearings 6.

One shaft 5 has fast with it a sprocket 7 for driving the frame about the horizontal axis of the stub shafts.

The frame is provided with passages 8, 9 which communicate respectively with bores 8a, 9a in the stub shafts 5, 5a. One passage 8 has a pipe 10 connecting the passage to a rotatable head 11 carried by a bearing 12 in the frame. The other passage 9 forms a first path for fluid to the jacks, a second path being provided by an independent pipe 9b communicating with a second bore in stub shaft 5a.

The platform 1 is rotatably supported by a bearing 13 coaxial with bearing 12.

Head 11 is similar to that shown in the Patent above referred to and the drive to that head comprises a worm and wheel 14 coupled to a pinion 15 which engages a static pinion 16.

In operation a tote box is located on the platform 1 which is raised by the jacks 2 to bring the open top of the box into engagement with the head. The drive to the sprocket 7 and the flow of cleaning fluid to the head is initiated. As the frame

rotates, the pinion 15 runs round the static pinion 16, thereby rotating the worm and wheel and thereby the head, tote box and platform about an axis normal to the axis of the stub shafts. The pinions 15 and 16 are of related size such that the head will complete one or more revolutions during a rotation of the frame about the horizontal axis so that after completion of the latter revolution the tote box will have returned to its initial attitude relative to the machine. Suitable passages are provided, preferably between the head and the box, to allow liquid from the box to escape during processing.

Instead of turning the head one or more complete revolutions the drive may provide an oscillatory movement of the head. Referring to FIG. 2 which is a plan view of the frame, the drive comprises a cam track 17 engaged by a follower 18 which is coupled to a lever 19 fast with the frame. The throw of the lever in the embodiment shown will be approximately 160°. In FIG. 3 there is again a lever 20 fast with the frame, the lever being coupled to a jack 21 the lines to which are controlled by a valve 22 responsive to stops 23 mounted in the path of the valve as it is carried round by the frame. The valve will cause the jack to oscillate the lever and frame.

What I claim is:

1. A machine for processing articles in open containers by means of a processing fluid, the machine comprising a housing frame, means rotatably supporting the frame about a first axis, a pair of container engaging means within and carried by the frame, means to move the container engaging means relative to one another to clamp a container therebetween and retain articles in the container, a frame drive means connected to the frame to rotate the frame about said first axis, a drive to one of the container engaging means to rotate the container engaging means about a second axis, perpendicular to the first, at least one of the axes being horizontal, a frame trunnion defining a hydraulic fluid line coupled to a jack operable to displace one container engaging means relative to the other, and means to pump the processing fluid through the container during rotation.

2. A machine according to claim 1 in which the frame drive means comprises a driving connection to a trunnion fast with the frame and the drive to the container engaging means comprises a pinion fast with a frame trunnion and engaging a pinion on a shaft carried by the frame, the shaft carrying a worm engaging a wheel fast with a container engaging means.

3. A machine according to claim 2 in which a frame trunnion defines a path for processing liquid, said path being connected to a passage through said wheel which will communicate with a container when engaged in the machine.

4. A machine according to claim 1 in which the drive to the container engaging means comprises a cam rotatable with the frame, a follower engaging the cam and a coupling between the follower and a link coupled to a member fast with the container engaging means and coaxial with the second axis.

5. A machine according to claim 1 in which the drive to the container engaging means comprises a double acting jack coupled to a link coupled to a member fast with the container engaging means and coaxial with the second axis, a valve controlling fluid supply to the jack and a control element rotatable with the frame to which the valve is responsive.

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