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Zellman

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[54] **PICKLE PACKING MACHINE**

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[73] Assignee: **M. A. Gedney Company,** Chaska, Minn.

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Related U.S. Application Data

[63] Continuation of Ser. No. 277,922, Aug. 4, 1972, abandoned.

[52] **U.S. Cl.** ..... **53/124 B;** 100/223; 100/291

[51] **Int. Cl.**[2] **B65B 1/24**

[58] **Field of Search** ..... 53/235, 124 R, 124 B, 24, 53/319, 324, 328, 368; 100/291, 223, 292

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[57] **ABSTRACT**

An improved apparatus for pressing pickles into glass jars which comprises a plunger assembly adapted for partial insertion into the jar, an inclined caming surface disposed above the plunger assembly, and a roller means associated with the plunger assembly and adapted for rolling engagement with said caming surface. As the plunger assembly moves in a relatively circular path beneath the caming surface, the roller means follows the inclined caming surface thereby causing the plunger assembly to move in a reciprocating up and down movement to press the pickles into said jar.

8 Claims, 6 Drawing Figures

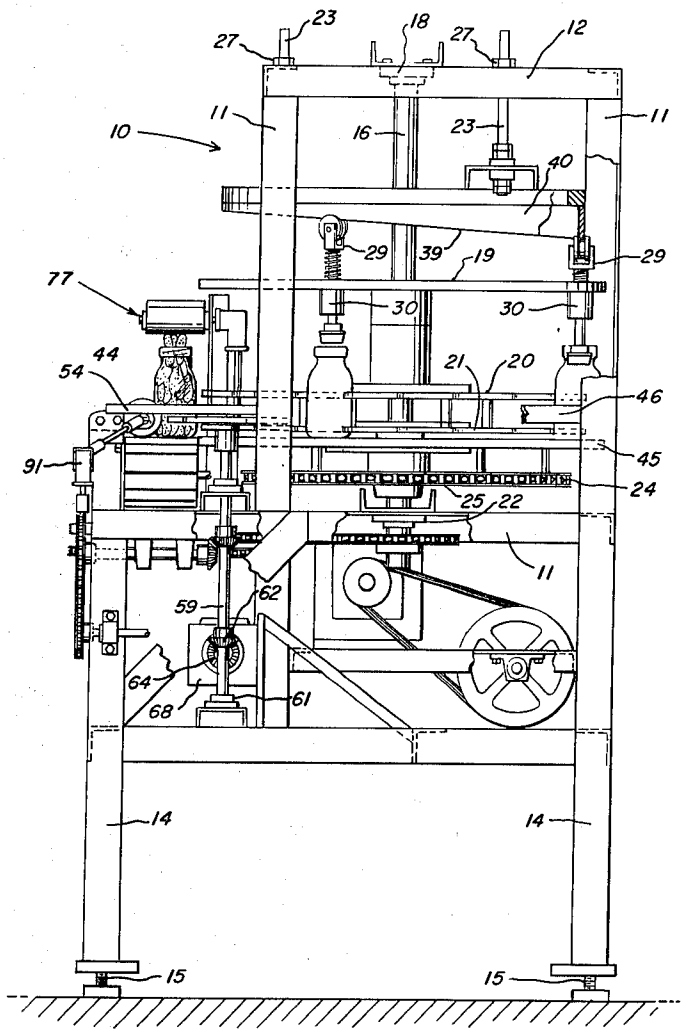


FIG. 1.

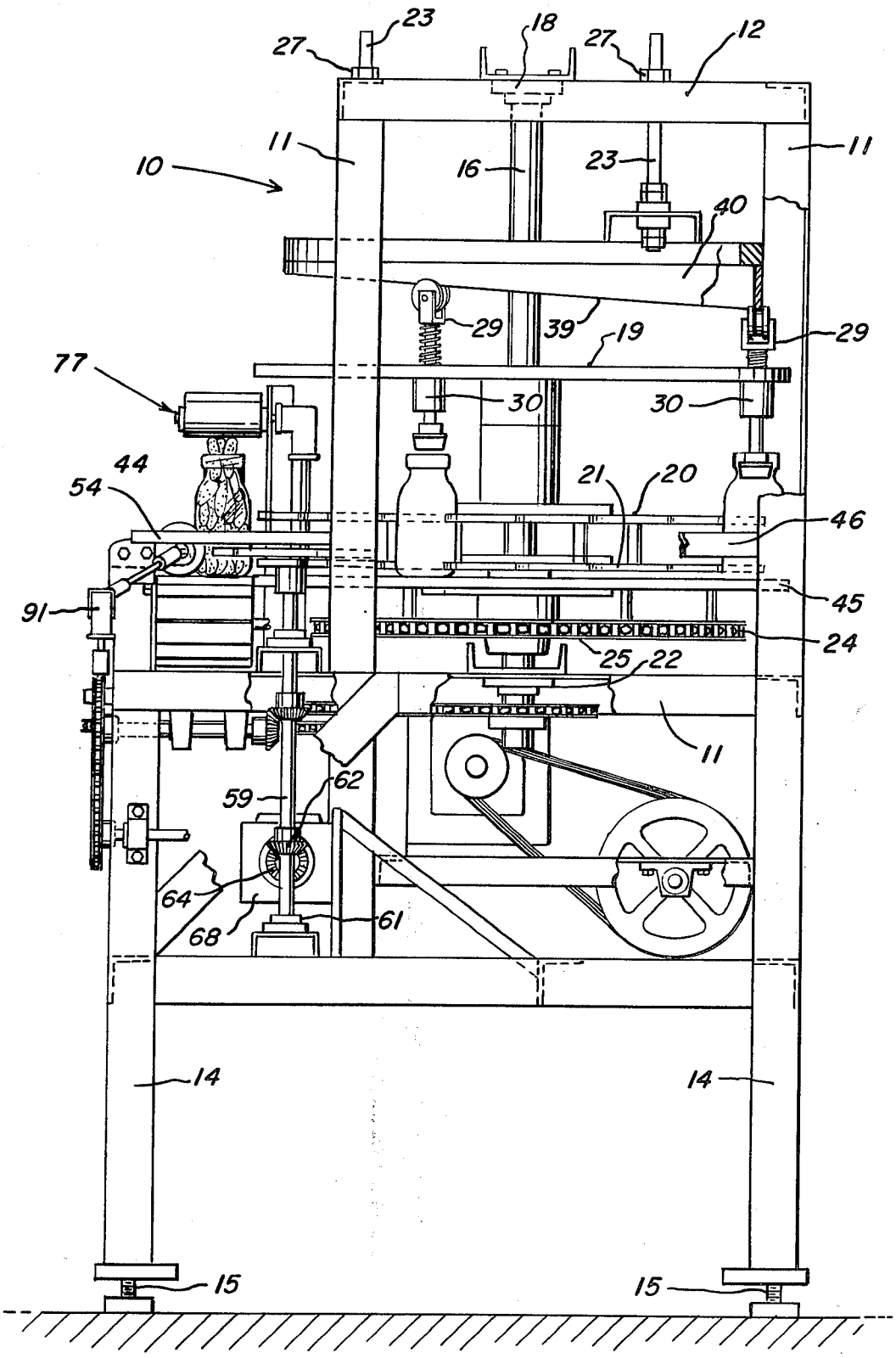
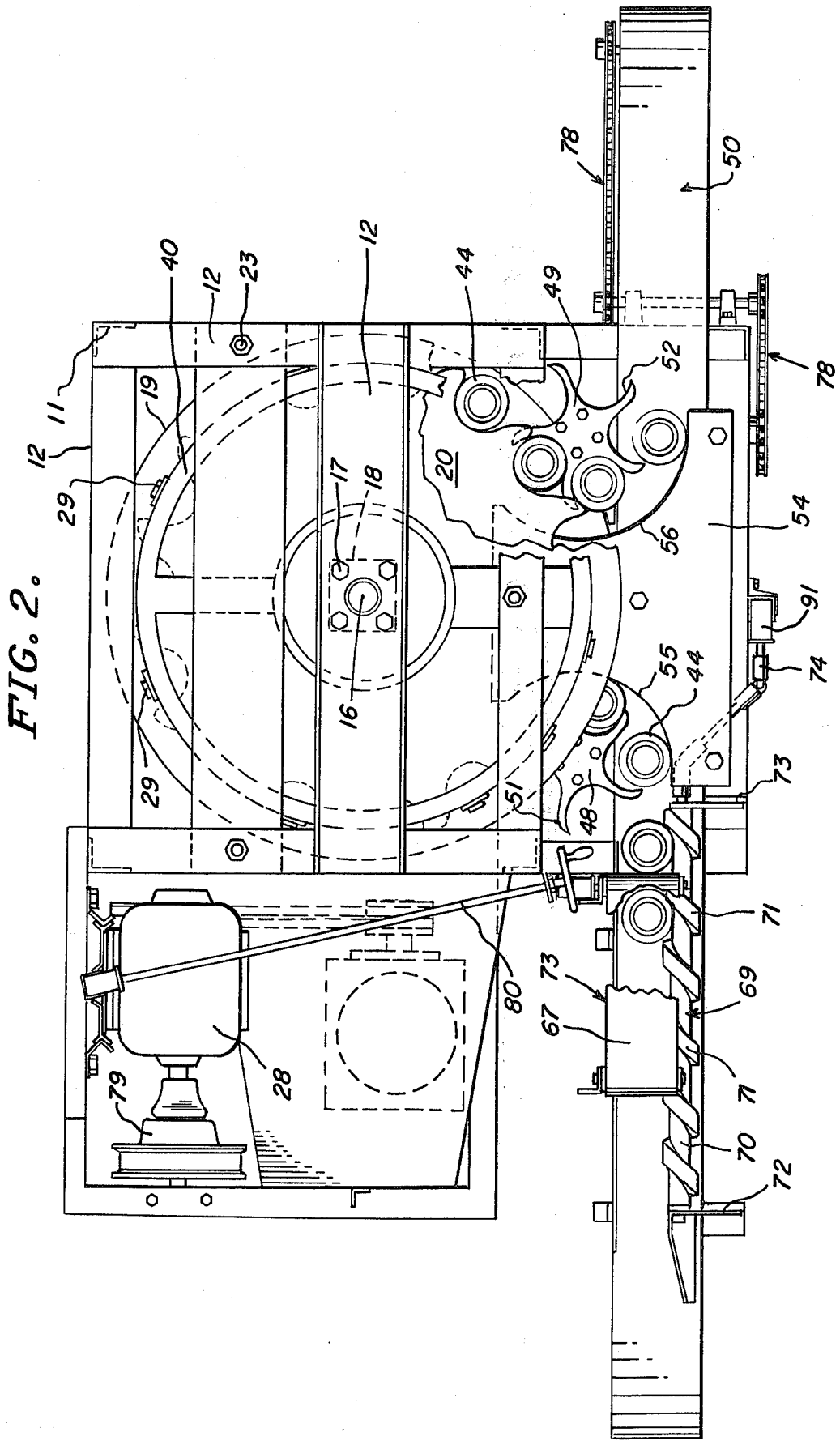

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FIG. 2.


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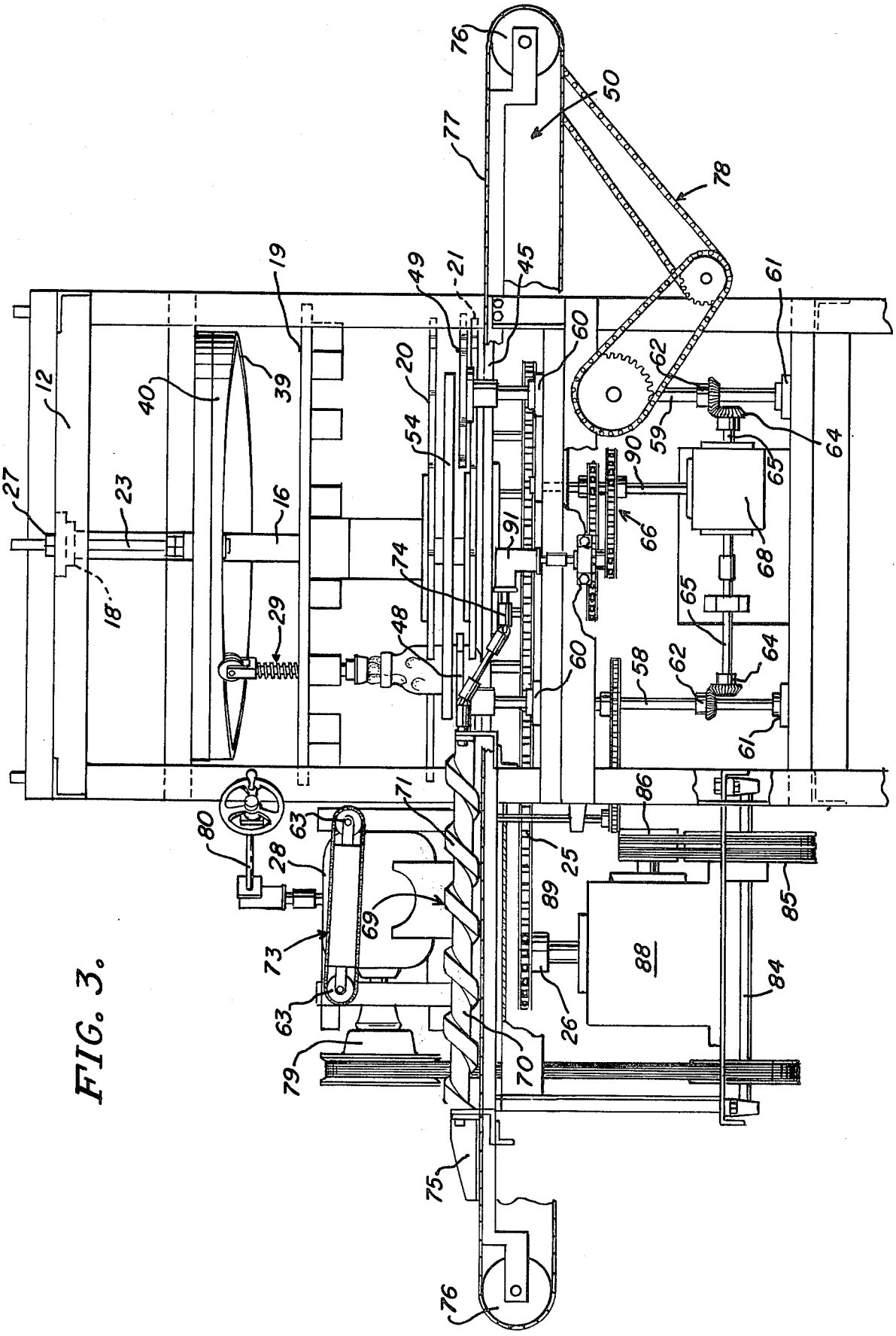

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FIG. 3.

FIG. 4.

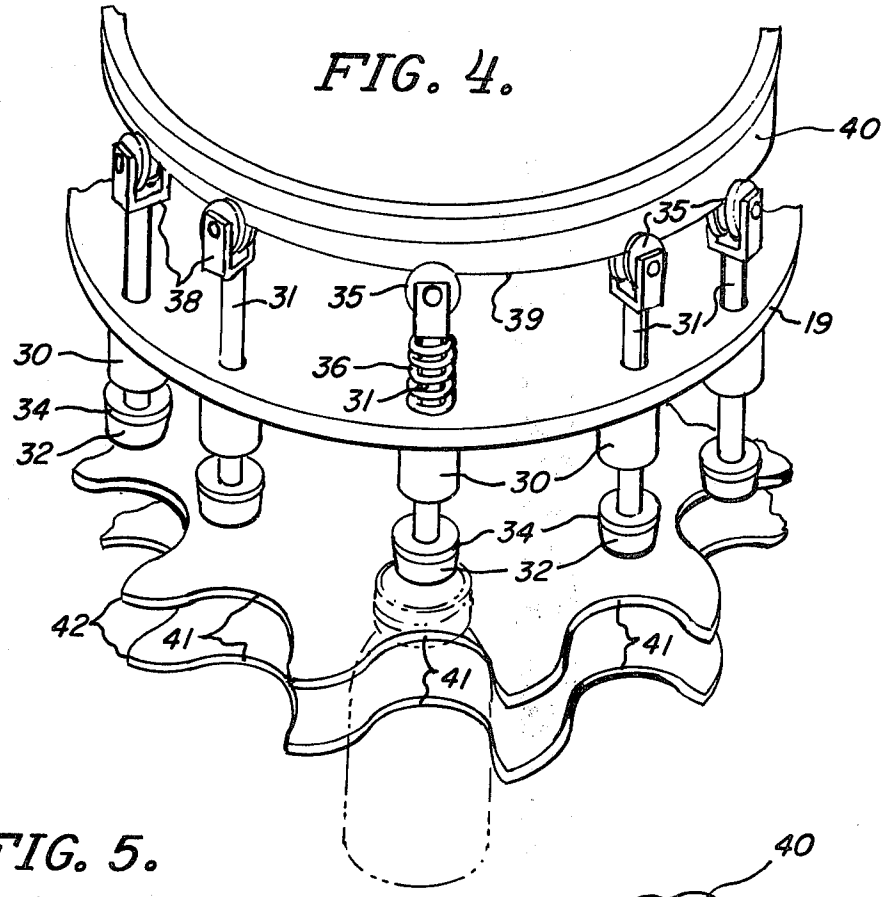


FIG. 5.

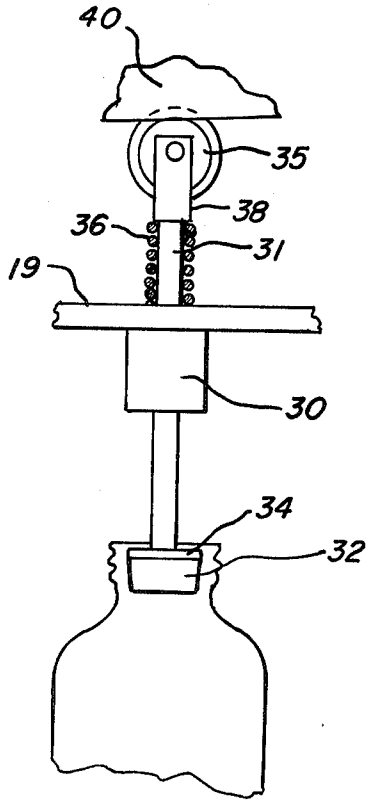
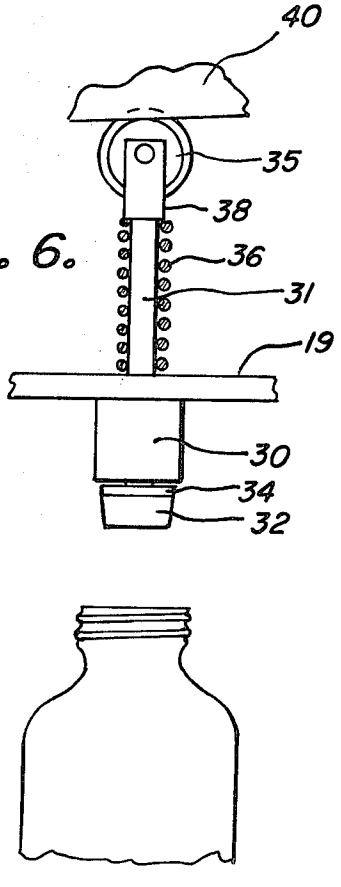


FIG. 6.



PICKLE PACKING MACHINE

This is a continuation, of application Ser. No. 277,922, filed Aug. 4, 1972, and now abandoned.

BACKGROUND OF THE INVENTION

The present invention relates generally to an apparatus for packing various fruits aand vegetables into containers and more specifically, to an apparatus for pressing pickles into glass jars.

During the process of canning many vegetables such as pickles, it is necessary that the vegetables be tightly packed or pressed into the containers in order to insure that the container lids can be properly fastened to the containers. Additionally, most pickle canners desire a certain percentage of the container to be filled with solids to conform with federal or state packing standards and/or to offer the consuming customer an appealing, tightly packed jar of pickles. Quite often these containers are glass jars having a relatively narrow neck portion in comparison to the main body of the jar. In the past, vegetables such as pickles were pressed and packed into these jars through the use of manual labor. With this process, the packers would press the pickles into the containers with a rubber packing mallet.

This process of packing pickles into jars was undesirable for several reasons. First, the cost was relatively high because of the manual labor necessary, and second, the percentage of breakage of the glass jars was relatively high. The breaking of a glass jar during the packing process not only resulted in considerable "down time" to remove the broken jar and the pickles, but also was relatively dangerous to the packer in terms of chances of personal injury. Consequently, there is a real need for a machine capable of pressing vegetables such as pickles into glass jars prior to the cooking process.

SUMMARY OF THE INVENTION

In contrast to the prior methods and apparatus for pressing pickles into their containers, the present invention relates to a machine for accomplishing the pressing step. More specifically, the apparatus of the present invention comprises a plurality of plunger assemblies adapted to partially fit into the pickle containers to press the pickles into those containers. The plunger assembly is actuated by a unique caming surface and spring means which causes reciprocation of the plunger means into and out of the pickle container. The machine further includes means for adjusting the position of the caming surface to accommodate different sizes of containers and a means for insuring proper registration and alignment between the containers and the plunger assembly during operation.

Accordingly, it is an object of the present invention to provide an apparatus for accomplishing the step of pressing pickles into a container during the pickle processing procedure.

Another object of the present invention is to provide such an apparatus which embodies a unique means for reciprocating the plunger means during the pressing step.

Another object of the present invention is to provide means for such an apparatus for varying the reciprocation stroke of the plunger assembly to thereby accommodate various sizes of containers.

A further object of the present invention is to provide an apparatus which accomplishes the step of pressing pickles in their containers automatically without manual labor.

These and other objects and advantages of the present invention will become apparent with reference to the drawings, the description of the preferred embodiment and the appended claims.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is an end plan view of the packing apparatus of the present invention.

FIG. **2** is a top plan view of the packing apparatus of the present invention.

FIG. **3** is a front plan view of the packing apparatus of the present invention.

FIG. **4** is a perspective view of a portion of the packing apparatus showing the relationship between the plunger assemblies and the caming surface.

FIG. **5** is a plan view of the apparatus showing a plunger assembly partially inserted in the jar of pickles.

FIG. **6** is a plan view of the apparatus showing the position of the plunger assembly in its uppermost position.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference generally to FIGS. **1, 2,** and **3,** the present invention is a machine **10** adapted for packing pickles into glass jars prior to sealing the jars. More specifically, the machine **10** includes a generally exterior frame which comprises a plurality of lateral frame members **11** and a top frame member **12** for supporting the machine **10.** Connected with the lower portion of the frame **11** are a plurality of legs **14.** Each of the legs **14** includes a leveling means **15** for leveling the machine **10.**

A vertically extending center shaft **16** is rotatably mounted at its top in a suitable bearing member which is indicated in phantom by reference numeral **18** and which is securely fastened to a portion of the upper frame member **12** by the bolts **17** (FIG. **2**). The shaft **16** extends downwardly from the bearing **18** and is successively connected by an appropriate fastening means to the center of a plunger supporting plate **19,** an upper and lower jar engaging plate **20** and **21** respectively, and a jar supporting plate **45.** The connection of the shaft **16** to the members **19, 20, 21** and **45** is such that the rotation of the shaft **16** causes corresponding rotation of each of the members **19, 20, 21** and **45.**

As best illustrated in FIGS. **1** and **3,** the shaft **16** extends below the lower plate **21** where it is rotatably journaled in an appropriate bearing **22** which is connected with a portion of the frame **11.** Connected with the shaft **16** immediately above the bearing **22** is a relatively large sprocket wheel **24** for rotating the shaft **16.** A conventional roller chain **25** (FIG. **3**) extends around and between the sprocket wheel **24** and a second sprocket wheel **26.** The sprocket wheel **26** is connected via an appropriate connection means with a drive means **28** for driving the wheel **24** and thus the shaft **16** and the members **19, 20, 21** and **45.**

As illustrated generally in FIGS. **1, 2** and **3** and more specifically in FIG. **4,** the plunger supporting plate **19** is a circular plate which is connected at its center to the shaft **16.** The plate **19** supports a plurality of plunger assemblies **29** equally circumferentially spaced near the periphery of the plate **19.** Integrally connected with the underside of the plate **19** are a plurality of sleeve

portions 30 associated with the plunger assemblies 29 for guiding the plunger assemblies 29 during up and down reciprocal movement.

Each of the plunger assemblies 29 includes an elongated shaft member 31 designed to extend through and be guided by the sleeve 30, a plunger head 32 mounted to the lower end of the shaft 31 and supported by a backing member 31, a roller means 35 and a plunger return means in the form of the compression spring 36. The roller 35 is rotatably connected with the upper end of the shaft 31 by means of the bifurcated yoke member 38 connected with the upper end of the shaft 31 by any appropriate means such as welding. The spring 36 is disposed about the elongated shaft 31 and has one end disposed against the upper surface of the plate 19 and the other end disposed against the bottom of the yoke member 38. Therefore, it can be seen that the force of the spring 36 tends to urge the yoke 38, and thus the entire plunger assembly 29 upwardly with respect to the plate 19.

The rollers 35 of each of the plunger assemblies 29 are designed and appropriately positioned to engage a vertically adjustable caming surface 39 which is defined by the bottom surface of a caming member 40. The caming member 40 is annular in shape with its annular length being relatively short when compared to its annular radius. As is evident from the drawings, the radius of the member 40 is such that the caming surface 39 is disposed directly above the rollers 35 of the plunger assemblies 29. The bottom surface of the member 40 is inclined to thereby define the caming surface 39. As best illustrated in FIGS. 1 and 3, the incline of the caming surface 39 is such that the vertical distance between the upper surface of the plate 19 and the caming surface 39 at the front side (left hand side as viewed in FIG. 1) of the machine is greater than the corresponding vertical distance at the back side (right hand side as viewed in FIG. 1) of the machine. The member 40 is adjustably secured by three support assemblies 23 to the frame 12. The assemblies 23 include an elongated threaded member and a lug 27 for adjusting the vertical position of the member 40. This adjustability enables the machine 10 to pack pickles into various sizes of jars.

Of course, the adjustment means also partially controls the movement of the plunger assemblies into the containers and thus the amount of time during which the plungers are actually in contact with the product during movement around the apparatus. This adjustment means also enables the cam surface 39 to be vertically adjusted to a position in which the relationship betwen the vertically adjusted cam surface 39 and a plurality of plunger assemblies 29 is such that each of the plunger assemblies is engaged in a pressing action, pressing pickles into the containers, throughout a substantial portion of the movement of the assemblies 29 and the container around the apparatus. As shown in FIGS. 1 and 3, the position of the cam surface 39 is such that the plunger assemblies 29 are engaged in pressing the pickles throughout in excess of one-half of the movement of the container through the apparatus. For example, in FIG. 3, which is a front view of the apparatus, the lower portion of the plunger assembly 29 is shown as already being engaged in a pressing action. In FIG. 1, which is a right hand side view, the lower portion of the plunger assembly 29 is shown as just coming out of the container. Thus, as illustrated, the caming surface 39 is shown in a position in which the plungers would be engaged in pressing action through in excess of one-half of the movement of the container through the apparatus. Also, with the adjusting means 23, the vertical position of the cam surface 39 can be adjusted to give a greater period of pressing action during movement of the container through the apparatus.

The rotation of the plate 19 and therefore the plunger assemblies 29 causes the rollers 35 to roll along the camming surface 39. Because of the springs 36, each of the rollers 35 and thus the corresponding plunger assemblies 29 are urged upwardly to a position in which the roller 35 is engaged with the surface 39 at all times. Thus, as the plate 19 rotates, the plunger assemblies 29 and their heads 32 are caused to reciprocate upwardly and downwardlly as the rollers 35 move along the inclined surface 39. As will be seen, this reciprocal movement results in the plunger head 32 moving into and out of a jar of pickles.

Referring now to FIGS. 2 and 4, each of the upper and lower jar engaging plates 20 and 21 comprise a generally circular plate with a plurality of concave portions equally circumferentially spaced about the periphery of each plate 20 and 21. Integrally connected with each concave portion is a curved lip portion 42 whose radius of curvature is toward the direction of rotational movement of the plates 20 and 21. It should be noted that each of the concave portions 41 of the upper plate 20 corresponds with a concave portion 41 of the lower plate 21 which together correspond to a plunger assembly 29. With this construction, a jar of pickles 44 or other fruit or vegetables desired to be packed can be guided in movement about the periphery of the plates through engagement with the portions 41 and 42 in the manner shown in FIG. 1–4.

When the jar 44 first engages the plates 20 and 21 near the front, the corresponding plunger assembly is in its uppermost position. The relative position between the plunger head 32 and the jar 44 at this time is that which is illustrated in FIG. 6. As the plates 20 and 21 and the plate 19 continue to rotate, however, the plunger assembly 29 is forced downwardly as a result of the roller engaging the downwardly inclined surface 39 thus forcing the plunger head 32 into the jar to pack the pickles in the manner illustrated in FIG. 5.

After the jar 44 reaches the back of the machine, the plunger assembly 29 and thus the plunger head 32 begin to move upwardly as a result of the roller 35 engaging the now upwardly inclined surface 39. This upward movement of the plunger assembly continues until the jar 44 is near the front of the machine at which point the jar is then removed from the machine in the manner described below. A rotating plate 45 positioned immediately below the lower plate 21 is designed to support the jar 44 during its movement through the machine 10. A guard rail 46 connected to the frame 11 between the plates 20 and 21 and spaced outwardly from the plates 20 and 21 is designed to keep the jars 44 in proper radial position with respect to the plunger assemblies 29 and to keep the jars 44 from falling off the support plate 45.

Referring to FIG. 2, the means for moving the jars 44 into and out of the machine 10 comprise a pair of rotating star members 48 and 49, a timing auger 69 and a conveyor 50. As shown, each of the members 48 and 49 include a plurality of outwardly extending fingers 51 and 52 respectively which curve slightly inwardly in the direction of rotational movement of the members 48 and 49. Associated with the members 48 and 49 and

securely fastened to the frame 11 is a guide means 54 extending for a limited distance toward the interior of the machine 10 between the plates 20 and 21. The guide member 54 includes a pair of concave portions 55 and 56 associated with the members 48 and 49 respectively to properly guide the movement of the jars 44 during the rotational movement of the members 48 and 49.

During rotational movement of the member 48, the fingers 51 are caused to engage a jar 44, as shown in FIG. 2, and move the jar 44 into engagement with the concave portion 55 of the member 54 for guidance into one of the concave portions 41 of the plates 20 and 21. Then the plates 20 and 21, as previously described, move the jars 44 in a relatively circular path through the machine until they reach the rotating member 49. During this movement, the corresponding plunger assembly 29 located immediately above the jar 44 moves downwardly as a result of the roller 35 engaging the caming surface 39 so that the plunger head 32 moves partially into the jar 44 as shown in FIG. 5 to press the pickles or other vegetables into the jar. After passing through the machine 10 and reaching the member 49, one of the fingers 52 of the member 49 engages the jar 44 and causes it to move into engagement with the concave portion 56 of the member 54 for movement out of the machine 10 and onto the conveyor 50 for conveyance to the next step in the canning operation.

As illustrated best in FIGS. 1 and 3, each of the members 48 and 49 is mounted to the upper end of a vertically extending shaft 58 and 59 respectively which in turn are journaled in an appropriate upper bearing 60 and an appropriate lower bearing 61. A bevel gear 62 is mounted to each of the shafts 58 and 59 near their bottom for engagement with a corresponding bevel gear 64. The gears 64, 64 are mounted on a shaft 65 which is driven by a suitable drive means. In the preferred embodiment, the drive means driving the shaft 65 is the same drive means 28 which also drives the center shaft 16 and thus the plates 19, 20 and 21. This is accomplished by suitable gearing means indicated generally by the reference numeral 66 and the gear box indicated by the reference numeral 68. It should be noted that the gearing is such that the movement of the plates 19, 20 and 21 and the members 48 and 49 is syncronized. Because of this syncronization, a jar 44 is supplied to a concave portion 41 of the plates 20 and 21 by the member 49 so that it properly positions the jar 44 into the concave portion 41, and the jar 44 is properly and timely removed from the machine by the fingers 52 of the member 49.

Associated with the conveyor 50 upstream from the machine 10 is a timing augar 69 shown best in FIGS. 2 and 3. The function of the augar 69 is to properly time the movement of the jars 44 into engagement with the member 48. As illustrated, the augar 69 is an elongated member having a cylindrical center portion 70 and a spiralling ridge 71 disposed on the outer surface of the portion 70. The ends of the augar 69 are rotatably supported by the brackets 72 and 73 and the augar 69 is caused to rotate by an appropriate gearing means 74 connected with a drive means. Like the members 48 and 49, the augar 69 is driven by the same drive means 28 which drives the center shaft 16 and the members 19, 20 and 21. The direction of the rotational movement of the augar 69, of course, is such that it causes the jars 44 to be guided toward the member 48. A guide rail 75 is disposed parallel to the augar 69 to insure engagement between the jar 44 and the groove formed between the spiralling ridge 71 and thus movement toward the member 48.

Associated with the timing auger 69 and positioned above the path of travel along which the auger guides the containers 44 is a pre-leveling means 73. The pre-leveling means includes an endless belt 67 supported by a pair of end pulleys 63 and, as best seen in FIG. 3 is disposed such that the belt 67 is inclined downwardly in the direction of movement of the containers toward the machine 10. The height of the belt 67 is such that as the container of pickles passes beneath the belt, the pickles are urged into the container by the belt 67. This insures that the pickles in the container will be at a level which the plunger assemblies 29 can readily accommodate. It should be noted that the pre-leveler 73 includes means for adjusting the height of the belt 67 to accommodate various sizes of jars.

Positioned adjacent to the machine 10 is the conveyor 50 which conveys jars of pickles to and from the machine 10. As viewed best in FIG. 3, the conveyor 50 includes an endless belt 77 extending around and between a pair of end pulleys 76. The pulley 76 at the discharge end of the conveyor 50 is connected by a plurality of suitable chains and sprockets 78 to a drive means for driving the conveyor 50. In the preferred embodiment, the means 78 is connected to the vertical shaft 59 which as heretofore described is connected with the main drive means 28. Thus, the conveyor 50, similar to the other moving parts of the machine 10, is driven by the drive means 28.

With general reference to FIGS. 1, 2 and 3, the drive system of the machine 10 may be understood as follows: First, there is but a single drive means 28 or motor which runs the entire machine. Connected with the motor 28 is a conventional variable speed pulley 79 and a means 80 for selectively varying the speed at which the machine 10 is driven. A V-belt 81 connects the pulley 79 with a pulley 82 mounted to the shaft 84. Also mounted on the shaft 84 is a second pulley 85 which, via the V-belt 86, transmits rotational movement to the gear box 88. A shaft 89 extends vertically from the gear box to support the sprocket 26. A conventional roller chain 25 extends around and between the sprocket 26 and the large sprocket 24 to drive the center shaft 16 and thus the plate members 19, 20, 21 and 45.

Connected with the lower end of the center shaft 16 is a chain and sprocket arrangement 66 which transmits rotational movement via the shaft 90 into the gear box 68 which in turn, through the bevel gears 62 and 64 and the shaft 65, drives the vertical shafts 58 and 59 and thus the members 48 and 49. An appropriate gearing arrangement 74 is connected via the means 91 to the chain and sprocket arrangement 66 to drive the augar 69. The chain and sprocket means 78 which is connected with the vertical shaft 59 by an appropriate bevel gear drives the conveyor 50.

The operation of the machine may be explained generally as follows: After adjusting the vertical position of the caming member 40 so that it accomodates the size of jar being used, the drive means 28 is started. As the jars of pickles are moved toward the machine by the feeder portion of the conveyor 50, they are properly spaced and directed by the timing augar 69 to the rotating member 48. The member 48, through its extending fingers 51 moves the jars 44 along the concave surface 55 into the concave portions 41 of the plates 20 and 21

where they are directed and moved in a generally circular path about the plates **20** and **21.**

As the jars **44** are guided by the concave portions **41** and **42,** a corresponding plunger assembly **29** is caused to be moved downwardly into the jar of pickles as a result of engagement between the roller **35** and the camming surface **39.** After the plunger assembly **29** reaches its downward most position, it begins to move upwardly as a result of the force of the spring **36** and the upward incline of the surface **39.** When the jar reaches the member **49,** it is directed along the surface **56** by the fingers **52** to the conveyor **50.**

Although the description of the preferred embodiment has been quite specific, it is contemplated that various modifications could be made to the preferred embodiment without deviating from the spirit of the present invention. Consequently, it is intended that the scope of the present invention be dictated by the appended claims rather than by the description of the preferred embodiment.

I claim:

1. An improved pickle packing apparatus for pressing pickles into a container and retaining the same therein sufficiently long so that said pickles remain wedged in said container below the top edge of said container without external retaining means after said pressing force is removed, said apparatus comprising:

a vertically adjustable cam surface arranged in a generally horizontally disposed closed loop;

a plurality of plunger assemblies moveable in a closed loop path below said cam surface, each having a first portion adapted for limited movement into a container and a second portion moveable with said first portion and adapted for engagement with said cam surface, said cam surface and each of said plunger assemblies being associated with each other such that movement of said plunger assembly in said closed loop path and engagement between said second portion and said cam surface causes vertical movement of said first portion into and out of said container, the shape of said cam surface and the relationship between said cam surface and said plurality of plunger assemblies being such that during movement of said plunger assemblies, said first portion is moved into said container in a pressing action and retained in such pressing action sufficiently long so that the pickles remain wedged in said container below the upper edge thereof without external retaining means after such pressing force is removed,

means for vertically adjusting said cam surface to a position in which the relationship between the vertically adjusted position of said cam surface and said plurality of plunger assemblies is such that at least two of said plunger assemblies are engaged in said pressing action simultaneously and such that each of said plunger assemblies is engaged in said pressing action throughout in excess of one-half of its movement along said closed loop path; and

alignment means properly aligning said containers with said plunger assemblies to enable said first portion of said plunger assembly to reciprocate into and out of said container.

2. The apparatus of claim **1** having a plunger assembly support plate disposed below said cam surface for supporting said plunger assemblies about its periphery.

3. The apparatus of claim **2** wherein said first portion is a plunger head and said second portion is a roller means and wherein said plunger assembly further includes a vertically disposed enlongated shaft slideably connected with said support plate for supporting said plunger head at one end and said roller means at the other end.

4. The apparatus of claim **3** wherein the closed loop of said cam surface is circular.

5. The apparatus of claim **4** having a bias means for insuring engagement between said cam surface and said second portion of said plunger assembly.

6. The apparatus of claim **2** wherein said alignment means includes a plate member having a shape conforming substantially to that of said plunger assembly support plate and further having a plurality of concave portions about its periphery, each such concave portion being below a corresponding plunger assembly for aligning said container with said plunger assembly.

7. The apparatus of claim **6** having means for causing rotational movement of said plunger assembly support plate and said plate number.

8. The apparatus of claim **1** having a timing auger for guiding said container into said aligning means.

* * * * *