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54 **Liquid dispensing machine.**

57 A filling machine for dispensing viscous liquid in measured amounts to containers wherein a carrier (32) supports a plurality of individual containers (y) with open upper ends for lateral orbiting movement with a central tank (16), a pump (A) and valve (19) assembly orbits with the carrier and has a plurality of rotary valves (27), communicating with outward passages (18) from the tank (16) and with piston pumps (25), and also communicating the piston pumps with dispensing openings (33) arranged above the containers (Y). The pistons (25c) of the pumps are controlled by a pivotal cam track (61) which can be swung to various positions to change the extent of the suction stroke of each piston, when operated by an actuating member. The machine is particularly designed for disassembly and for cleaning (98, 96, 97).

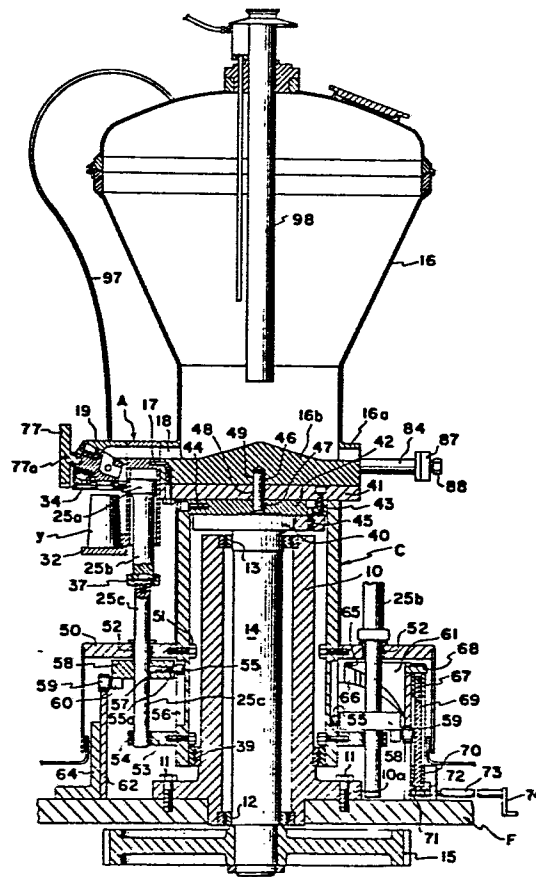


FIG 1

TITLE MODIFIED
see front page

VARIABLE VOLUME, POSITIVE DISPLACEMENT
SANITARY LIQUID DISPENSING MACHINE

The invention particularly relates to container filling machines of the type useful in the environment designated in U.S. patent 3,800,400 and more particularly relates to improvements in machines
5 of the type disclosed in U.S. patent 3,601,288. While not limited to the dispensing of charges of material into plastic containers, the machine is particularly useful in dispensing a predetermined quantity of fluid, or semi-fluid product from a supply which is contained
10 in a tank or the like, and typical products may include yogurt and milk.

One of the prime objects of the present invention is to design an extremely sanitary machine which dispenses only metered volumes of material to
15 the containers, and is capable of readily dispensing different metered charges to containers of different size, with only a simple and convenient pump stroke varying mechanism.

Still another object of the invention is to
20 provide a filling machine of the character described

which positively prevents the dispensing of product to a container pedestal to which no container has, in fact, been delivered in a most reliable and economical manner.

5 Still another object of the invention is to provide a construction which can be readily cleaned, and readily reassembled.

 A sanitary filling machine with a carrier for individual containers and surrounding a central
10 supply tank, is rotated with the tank and rotary valves are provided which in one position feed material from tank outlet passages to a plurality of positive displacement pistons, and in another position permit the pumping of material by the pistons
15 through dispensing openings to the containers, a cam track for determining the lower position of each pump piston in the suction stroke is swingable to various adjusted positions to meter material to the container according to the volume of the containers being filled.
20 The mechanism is constructed to facilitate cleaning.

 Other objects and advantages of the invention will be pointed out specifically or will become apparent from the following description when it is considered in conjunction with the appended claims
25 and the accompanying drawings, in which:

 Figure 1 is a fragmentary, sectional, side

elevational view of the filling machine;

Figure 2 is an enlarged, fragmentary, sectional, elevational view more particularly illustrating the dispensing valve assembly and associated parts;

Figure 3 is a schematic top plan view illustrating positions of the pump piston controlling cams and the abutments for shifting the dispensing valve handles to rotate the valves;

Figure 4 is a sectional plan view of one of the abutments illustrating mechanism for retracting it when no container is in position to receive a charge of material from the pump;

Figure 5 is a fragmentary top plan view illustrating the manner in which the valve and pump housings are mounted for ready disassembly;

Figure 6 is a front elevational view of one of the pump housings;

Figure 7 is a front elevational view of one of the valve housings; and

Figure 8 is a diagrammatic side elevational view with the curvilinear cams shown as though they were linear, the chain lines illustrating another position of the swingable cam and the cam follower roller.

Referring now more particularly to the

accompanying drawings, the machine is shown as having a frame F supporting an upstanding sleeve 10 which has a flange 10a bolted to the frame at 11. Bearings 12 and 13 mounted by sleeve 10 journal a central shaft 14 which is adapted to be driven by a spur gear 15 connected with any suitable source of rotary power.

A tank mounting orbiting assembly, to be later described, supports a liquid-filled tank 16 for rotation with the shaft 14. Also mounted for rotation with the assembly are a plurality of pump housing assemblies A, pins 17 being provided to secure the housings A in place surrounding the outlet portion 16a of tank 16 as shown. It is to be understood that the outlet portion 16a has an outlet passage 18 and that the number of assemblies A depend on how many containers are to be supported on the machine and filled during the revolution of shaft 14. The passages 18 are in radial alignment with passages 18a provided in the pump housing assemblies A, which, as Figure 2 indicates, are sandwiched between the tank outlet portion 16a and a plurality of valve mounting and material dispensing housing assemblies 19 which are mounted outboard radially of each pump housing assembly A. As Figure 2 indicates, seal rings 20 are provided around outlet portion 18 in slots 21 provided in each housing A to seal pas-

sages 18 and 18a at the juncture of housings A and 16a, and circular seal rings 22 are provided in slots 23 in the housing assemblies 19 to seal the passages 18a and passages 19a provided in the assemblies 19
5 at the juncture of the housings 19 and A.

Each pump assembly housing A includes a dependent cylinder 24 within which a piston pump 25 (which is designated 25a) being slotted to receive a sealing O-ring 26 as shown. Each assembly 19 is provided with a frustoconically shaped recess R communicating with an associated passage 19a to receive a rotary frustoconical valve 27 which later will be more particularly described, and it will be seen that a pump cylinder 24 is positioned opposite each
10 recess R and valve 27. Springs 27b retained by removable retainers 27a secured in the outer ends of the recesses R urge valves 27 inwardly and a sealing ring 27d is provided as shown. Openings 29 are provided in the radial outer wall of each pump cylinder
15 24, so that when a valve 27, with its port system 30, is in the position shown in Figure 2, it communicates the passage 19a with the filling passage 31 above piston 25a via a port 29. Each port system 30 includes ports 30a and 30b, and a port 30e perpendicular to port 30b, and in the Figure 2 position,
20 ports 30a and 30b communicate passage 19a with pump

housing 24. Each pump assembly housing A carries a container supporting pedestal 32 having a partly enclosing side wall 32a for supporting an open-topped yogurt container y which is in position to be filled through a dispensing opening 33 provided above each pedestal 32 in communication with each valve recess R. It is to be understood that, when the valve 27 is rotated approximately 90° from the suction position in which it is shown in Figure 2, port 30e of angle shaped passage system 30 will communicate with the dispensing opening 33 and deliver material ejected by the pump piston 25a through port 29 and the portion 30b of passage system 30 to dispensing opening 33 via port 30e. Mounted below valve housings 19 are a pair of semi-circular, detachable, orbiting, condensate collecting and spill trays 34, each having passages 34a beneath each opening 33 formed by riser walls 35 which are of greater height than the tray outer lips 36.

It will be seen that each pump plunger 25 includes an upper stem part 25b and a lower stem part 25c, joined by a coupling 37.

The rotatable tank-supporting annulus frame or cage C, which is journaled by a bearing 39, includes a top plate 41 to which an under plate 42 is bolted as at 43. Under plate 42 is bolted to the

annular cage C as at 44. Depending from plate 42 is the flange 40 which is welded to shaft 14 and may be bolted to plate 42 as at 45. A pin 46 centrally disposed in openings 47, 48 and 49 in members 42, 41, and
5 a bottom plate 16b for tank 16, respectively, is provided as shown to aid in locating the parts for assembly.

As Figure 1 indicates, a guide ring 50, bolted to the cage C intermediate its length as at 51,
10 mounts slide bearings 52 for the pump piston lower parts 25c, and a further guide ring 53 with slide bushings 54 for the piston stem parts 25c is also provided.

Figure 1 shows a pump piston 25 in both
15 an upper and lower position. Provided to guide each piston in its vertical travel relative to cage C, is a follower roller 55 received within a recessed guideway 56 formed in cage C. Each roller 55 is mounted on a threaded stem 55a received in a threaded
20 opening 57 provided in a block 58 fixed to the lower stem part 25c of each piston 25.

The vertical position of each piston 25 at any time is determined by the vertical position of a cam follower roller 59 which is mounted in a block
25 60 dependent from each block 58. The vertical position of each roller 59 is influenced by either an

upper arcuate cam part 61 or a lower annular cam part 62, dependent on its orbital position. The lower cam part 62 is fixedly secured to an angle plate 64 which is fixedly secured to frame F. The upper cam part 61 is pivotally secured as at 65 to a brace 66 projecting inwardly from frame F and mounted for vertical swinging movement upwardly and downwardly relative to fixed cam part 62 to vary the lower limit position of each plunger 25 and determine the volume of liquid dispensed according to the size of the container being filled. To accomplish the desired adjustment of upper cam part 61, a nut 67 pinned to the end of the cam part 61 as at 68, receives a screw 69 which is journaled by frame F as at 70. A gear 71 on the lower end of screw 69 is in mesh with a worm gear 72 fixed on an adjusting shaft 73 which is fixed against axial movement journaled by frame F. Preferably, a hand wheel 74 may be provided on shaft 73 to permit its manual rotation or, if desired, the shaft 73 could be motor driven. The lowermost positions of cam 61 and roller 59 are indicated at 61' and 59' respectively in Figure 8.

Figure 3 schematically depicts the positions of the cam parts 61-62 and the valve 27 control or actuation abutments 75 and 76. These abutments are provided in the rotary path of the levers or

handles 77 which are pinned as at 77a to the stem portion 27a of each valve 27, handles 77 having stems 77b received in bores 27e provided in the outer end of each valve 27. The abutment 75 is

5 fixed in position and arranged to rotate the valves 27 approximately 90 degrees when the ends of the handles 77 strike them, to a suction position in which the port systems 30 is in communication with passages 19a and out of communication with openings

10 33. This occurs after the charge of material has been delivered to the container at a time when the pump pistons 25 are in "up" position. Abutment 76 normally reverses each valve 27 because it is at a different level in position to engage the opposite

15 upper end of each handle 77 and cause it to swing in the opposite direction. It is to be observed however, that the abutment 76 is retractable from normal position to a position in which it is radially out of the path of the handles 77 and will not activate them to

20 move the valve bodies 27 to a dispensing position. For this reason, abutment 76 is mounted on a bar 78 (Figure 4) having stems 78a received in bushings 79 provided in a solenoid casing 80. The stems 78a are in surrounding relation with a solenoid core 81

25 and spring 82 is provided to normally force bar 78 to outer normal position.

Certain critical parts are fabricated and assembled in a particular manner to permit their ready dis-assembly for periodic cleaning purposes. In addition a "clean-in-place" system is provided
5 which is used to clean the parts on a daily basis. Figures 5 through 7 particularly indicate the manner in which the assemblies 19 and A are supported by the tank housing 16b in the manner which permits them to be easily dis-assembled. It will be observed that
10 the outer perimeter of part 16b is a fourteen-sided polygon and it will further be observed that threaded openings 83 are provided in the tank part 16b at the junctures of the mounting walls of the portions 16b to accommodate mounting stud members 84.

15 As Figure 6 particularly indicates, the housings A in front elevation are substantially T-shaped and include converging sockets 85 from which the assemblies A are suspended on studs 84. Likewise, (see Figure 7) the assemblies 19, which also
20 are generally T-shaped in front elevation, have converging sockets 86 to similarly suspend the assemblies 19 on the studs 84. Clamp washers 87 provided on the studs 84 may be secured by nuts 88 within recesses formed by shouldering the assemblies 19 as
25 at 19c, and as will be seen have wedge walls 87a which engage with similarly inclined walls 89 on the assembly

portions 19 to clamp the housings 19, and thereby the housings A, securely in position. To disassemble the housings 19 and A for cleaning and obtain access to passages 18, it is merely necessary
5 to back off the nuts 88 and lift the parts 19 and A vertically from the studs 84. It is extremely easy likewise then to simply replace them in position again and tighten nuts 88 when reassembly is to be effected.

10 When it is desired to clean the critical parts of the assembly "in place", the semi-circular trays 34 are removed and plug members 90 (Figure 7) are pushed up into position in the recessed openings 91 provided in housings 19 surrounding dispensing
15 openings 33. Each plug 90 includes a shoulder portion 90a snugly fitting into opening 91 and has an O-ring or other suitable seal 92, as shown. To secure the plugs 90 in position, outboard walls 93 thereon have bayonet slots 94 for receiving pins 95 provided
20 on the assemblies 19 and the plugs 90 are twisted to engage the pins 95 in the slots as the plugs 90 are moved into position. Leading upwardly from each assembly 19 from plug receiving chamber 91, is a passage 96 leading to a tube 97. Tube 97, as indicated in Figure
25 1 leads back into tank 16.

 In order to clean the assembly in place, each of the recesses 91 in each housing 19 is fitted with a

plug 90 and water introduced through the tube 98 into the interior of tank 16 is then re-circulated through the assemblies A and 19 back to the tank 16 via ports 96 and hoses 97. Only one hose 97 has been
5 shown in Figure 1 but it is to be understood that each of the housings 19 may have a hose 97 or that a manifold (not shown) can be provided to which ports 96 lead and that a single hose may then lead from it back into tank 16. When a water flush has been accom-
10 plished, one of the parts 27 can be removed to drain the water from the system. Thereafter the process can be repeated with a sanitized cleaning solution, and suitable water and cleaning solution flushes can be alternated until the desired sanitary cleaning has
15 been accomplished.

It is believed that the operation of the device will be readily understood from the foregoing description. In practice, as indicated in Figure 3, a star wheel 99 is provided to deliver containers
20 to each pedestal 32 as the pedestals move past the pockets 99a in the star wheel. Just prior to the time that a particular pedestal 32 reaches the container loading position, abutment 75 has been engaged by the handle 77 of the particular assembly 19
25 to rotate the particular valve 27 through substantially 90° to the "fill" position. At this time, the

piston 25 is in its lowermost position, riding on the lower fixed cam 62. As the particular assembly rotates around, fixed cam 62 (see Figure 8) moves the piston 25 upwardly to dispense fluid to the container and by the time fixed abutment 75 is reached, the dispensing operation has been completed. When the opposite end of handle 77 contacts abutment 75, the valve 27 is reversed to bring the valve 27 to the Figure 2 position, and the suction stroke of the pump piston 25 can begin. By the time a container reaches the star wheel 100 and is removed by it, valve 27 has completely closed and the position of star wheel 100 is such that its pockets 100a engage and remove the container from each pedestal 32 at a point slightly downstream from the fixed abutment 75.

It is the upper cam 61 which moves the piston 25 downwardly in the suction stroke indicated in Figure 3. As Figure 8 demonstrates, the pivotal position of cam 61 determines the length of the suction stroke within certain predetermined limits to handle the volume requirements of various containers. In Figure 8 the two extreme bottom positions of the follower rollers 59 are shown at 59 and 59' respectively. When the roller 59 is in the position indicated in solid lines in Figure 8, it can move across to the cam surface of cam 62 in the path x and bypasses part of the cam surface 62.

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CLAIMS:

1. In a machine for dispensing liquid and semi-liquid material and the like in measured amounts to containers and having a supply tank with a plurality of circumferentially spaced radial tank outlet openings;
5 a carrier for supporting a multiplicity of containers with open upper ends mounted for lateral orbiting movement with said tank; a filler pump and valve assembly, mounted to orbit with the carrier, and connected with said tank, the assembly having a
10 plurality of passages communicating with the tank outlet openings, the assembly also having a plurality of separate pump communicating passages, and a plurality of separate dispensing openings disposed above the path of movement of the carrier and the containers
15 thereon; the said passages being arranged in radially aligned sets, each having a tank outlet passage, a pump communicating passage, and a dispensing opening; said assembly also including a valve for each set with passage means in the valve in one position feed-
20 ing material to the pump communicating opening from the tank outlet passage and in another position feeding material from the pump communicating opening to the dispensing opening; and a pump cylinder portion on said assembly for each passage set in communication

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with the pump communication opening of the set; each pump cylinder portion having a piston mounted for reciprocating movement in a suction and ejection stroke; arcuate cam track means about which the

5 pump pistons orbit, the pistons being connected with followers moved by the cam track means to provide the stroke of the pistons and determine the amount of material moved by a pump piston out the dispensing opening of each set; the improvement wherein said

10 frame has a sleeve, internally journaling a central shaft and externally journaling a cage hung from the upper part of said central shaft, the cage externally mounting the pistons for reciprocatory movement vertically and having a guide slot opposite each piston;

15 guide means projects laterally from each piston and is receivable in one of said guide slots to prevent piston rotation; brace supports project radially from the tank assembly; said filler pump and valve assemblies have converging recesses at their sides

20 permitting their suspension from a pair of said supports in a manner to be liftable vertically off the supports for individual cleaning; and means on said supports to individually releasably clamp said assemblies in place.

25 2. The apparatus as set forth in claim 1 wherein said cam track means comprises an upper track

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part and a lower track part, with a follower receiving surface on each; means is provided for pivotally mounting the upper track at one end for vertical swinging movements relative to the lower track, and
5 actuating means is connected with the opposite end of said upper track for swinging it to change its vertical position.

3. The apparatus as set forth in claim 1 wherein plug members may be received by said assemblies to
10 block said dispensing openings; passages are provided in each of said assemblies to remove material blocked by one of said plugs to an exit port; and conduit means connects said exit ports.

4. In a machine for dispensing liquid and semi-
15 liquid material and the like in measured amounts to containers and having a supply tank with a plurality of circumferentially spaced radial tank outlet openings; a frame; a carrier rotatable thereon for supporting a multiplicity of containers with open upper
20 ends mounted for lateral orbiting movement with said tank; a filler pump and valve assembly, mounted to orbit with the carrier, and connected with said tank, the assembly having a plurality of passages communicating with the tank outlet openings, the assembly
25 also having a plurality of separate pump communicating passages, and a plurality of separate dispensing

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openings disposed above the path of movement of the carrier and the containers thereon; the said passages being arranged in radially aligned sets, each having a tank outlet passage, a pump communicating passage, and a dispensing opening; said assembly also including a valve for each set with passage means in the valve in one position feeding material to the pump communicating opening from the tank outlet passage and in another position feeding material from the pump communicating opening to the dispensing opening; and a pump cylinder portion on said assembly for each passage set in communication with the pump communication opening of the set; each pump cylinder portion having a piston mounted for reciprocating movement in a suction and ejection stroke; arcuate cam track means about which the pump pistons orbit, the pistons being connected with followers moved by the cam track means to provide the stroke of the pistons and determine the amount of material moved by a pump piston out the dispensing opening of each set; the improvement wherein aligning supports project radially from the tank and said filler pump and valve assemblies have radially converging aligning sockets at their sides permitting their suspension from a pair of said supports in a manner to be liftable vertically off the supports for individual cleaning, and

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means on said supports individually releasably secures said assemblies in place.

5 5. The apparatus as set forth in claim 4 wherein the cam track means includes a pivotal portion which can be swung about one end to positions to change the extent of the stroke of each piston; and actuating means is connected with said pivotal portion for swinging it to change its position.

10 6. The apparatus as set forth in claim 4 wherein said frame has a sleeve internally journaling a driven central shaft and externally journaling a cage supported from one end of said central shaft; the case externally mounting the pistons for reciprocating movement vertically and having means opposite each piston and connected therewith for preventing piston rotation.

15 7. The improvement as set forth in claim 4 wherein means is provided in each assembly to lock in a plug member to block the dispensing opening; passage means are provided in each of said assemblies in communication therewith to lead to an exit port; and conduit means connects all said exit ports with the tank to recirculate cleaning fluid thereto.

20 8. In a machine for dispensing liquid and semi-liquid material and the like in measured amounts to containers and having a supply tank with a plurality of circumferentially spaced radial tank outlet openings;

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a frame; a carrier rotatable thereon for supporting
a multiplicity of containers with open upper ends
mounted for lateral orbiting movement with said tank;
a filler pump and valve assembly, mounted to orbit
5 with the carrier, and connected with said tank, the
assembly having a plurality of passages communicating
with the tank outlet openings, the assembly also
having a plurality of separate pump communicating pas-
sages, and a plurality of separate dispensing openings
10 disposed above the path of movement of the carrier
and the containers thereon; the said passages being
arranged in radially aligned sets, each having a tank
outlet passage, a pump communicating passage, and a
dispensing opening; said assembly also including a
15 valve for each set with passage means in the valve in
one position feeding material to the pump communica-
ting opening from the tank outlet passage and in an-
other position feeding material from the pump communi-
cating opening to the dispensing opening; and a pump
20 cylinder portion on said assembly for each passage
set in communication with the pump communication open-
ing of the set; each pump cylinder portion having a
piston mounted for reciprocating movement in a suc-
tion and ejection stroke; arcuate cam track means
25 about which the pump pistons orbit, the pistons being
connected with followers moved by the cam track means

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to provide the stroke of the pistons and determine the amount of material moved by a pump piston out the dispensing opening of each set; the improvement wherein recesses are provided in said assemblies surrounding said dispensing openings; plug members are lockably releasably receivable by said assemblies in said recesses outboard of said dispensing openings to block said recesses; and passages in each of said assemblies separated from the dispensing openings lead from the recesses and inner faces of said plug members through the assemblies to exit ports, and conduit means connects said exit ports with the tank to recirculate cleaning liquid thereto.

9. The apparatus as set forth in claim 8 wherein said cam track means includes a pivotal portion which can be swung about one end to positions to change the extent of the stroke of each piston; and actuating means is connected with said pivotal portion for swinging it to change its position.

10. The apparatus as set forth in claim 8 wherein said frame has a sleeve internally journaling a driven central shaft and externally journaling a cage hung from the upper part of said central shaft, the cage externally mounting the pistons for reciprocatory movement vertically.

11. The machine of claim 8 wherein said cam track means comprises an upper track part and a lower

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track part, with a follower receiving surface on each;
the follower receiving surface on the lower surface
of the upper track being downwardly inclined and the
lower track receiving surface on the upper surface
5 of the lower track being upwardly inclined; means
for pivotally mounting the upper track about one end
for vertical swinging movement about a generally
horizontal axis; and means connecting said actuating
means to the opposite end of the upper track to move
10 it upwardly and downwardly about the pivot to positions
which determine the extent of the downward suction
stroke of each orbiting piston to vary its amplitude.

12. In a machine for dispensing liquid and semi-
liquid material and the like in measured amounts to
15 containers and having a supply tank with a plurality
of circumferentially spaced radial tank outlet open-
ings; a frame; a carrier rotatable thereon for sup-
porting a multiplicity of containers with open upper
ends mounted for lateral orbiting movement with said
20 tank; drive means for revolving the carrier in 360°
revolution; a filler pump and valve assembly, mounted
to orbit with the carrier, and connected with said
tank, the assembly having a plurality of passages
communicating with the tank outlet openings, the
25 assembly also having a plurality of separate pump
communicating passages, and a plurality of separate

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dispensing openings disposed above the path of movement of the carrier and the containers thereon; the said passages being arranged in radially aligned sets, each having a tank outlet passage, a pump communicating passage, and a dispensing opening; said assembly also including a valve for each set with passage means in the valve in one position feeding material to the pump communicating opening from the tank outlet passage and in another position feeding material from the pump communicating opening to the dispensing opening; first valve actuating means located adjacent the orbital path of the carrier and said valves in an orbital position to actuate the valves to communicate the tank outlet passages with the pump communicating passages; second valve actuating means located adjacent the orbital path of the carrier and said valves in a downstream orbital position to actuate the valves to block the tank outlet passages to the pump and communicate the pump passages with the dispensing openings; the first and second valve actuating means being peripherally spaced to define a pump filling portion of the orbit and a dispensing portion of different orbital extent; and a vertically extending pump cylinder portion on said assembly for each passage set having one end in communication with the pump communication opening of the set; each pump

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cylinder portion having a piston mounted for reciprocating movement in a suction and ejection stroke; the pistons having rod portions extending from opposite ends of the cylinders connected with followers

5 which are actuatable to provide the stroke of the pistons and determine the amount of material moved by a pump piston out the dispensing opening of each set; a peripherally extending, arcuate suction stroke controlling cam track extending angularly around only

10 a portion of the orbital path of the carrier substantially from one valve actuating means to the other to define the pump filling suction portion of the orbit, and mounted by the frame for pivotal movement in a vertical plane about one of its ends; the cam track

15 having a follower-engaged surface facing away from said cylinder portions and extending from said one end to an opposite free end; cam positioning means connected to swing the free end of the cam track upwardly and downwardly and hold it in a vertically selected

20 position which determines the suction strokes of the pistons; a peripherally extending arcuate dispensing stroke controlling cam track extending angularly around a remaining portion of the path of the carrier from said second valve actuating means back toward

25 the first valve actuating means in a downstream direc-

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tion, the dispensing stroke cam track having a follower-engaged surface facing oppositely to the surface of the suction stroke controlling cam track for positively moving the pistons in their dispensing strokes;

5 the dispensing stroke controlling cam track being spaced vertically from the free end of the pump filling stroke cam track a distance greater than the vertical extent of the followers sufficiently to permit the free end of the pump filling stroke cam track

10 to assume a range of vertical positions and the followers to proceed orbitally beyond said free end before engaging the dispensing stroke controlling cam track.

13. The apparatus as set forth in claim 12 wherein

15 in said frame has a sleeve internally journalling a driven central shaft and externally journalling cage means supported from one end of said central shaft; the cage means externally mounting the pistons for reciprocatory movement vertically.

20 14. The apparatus as set forth in claim 12 wherein securing braces project radially from the tank and said filler pump and valve assemblies have converging sockets at their sides permitting their suspension from a pair of said braces; and means

25 for clamping each assembly individually in releasable position.

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15. The apparatus as set forth in claim 12
wherein said assemblies have means surrounding said
dispensing openings to receive plug members; and
passages in said assemblies lead from the inner faces
5 of said plug members through the assemblies to exit
ports.

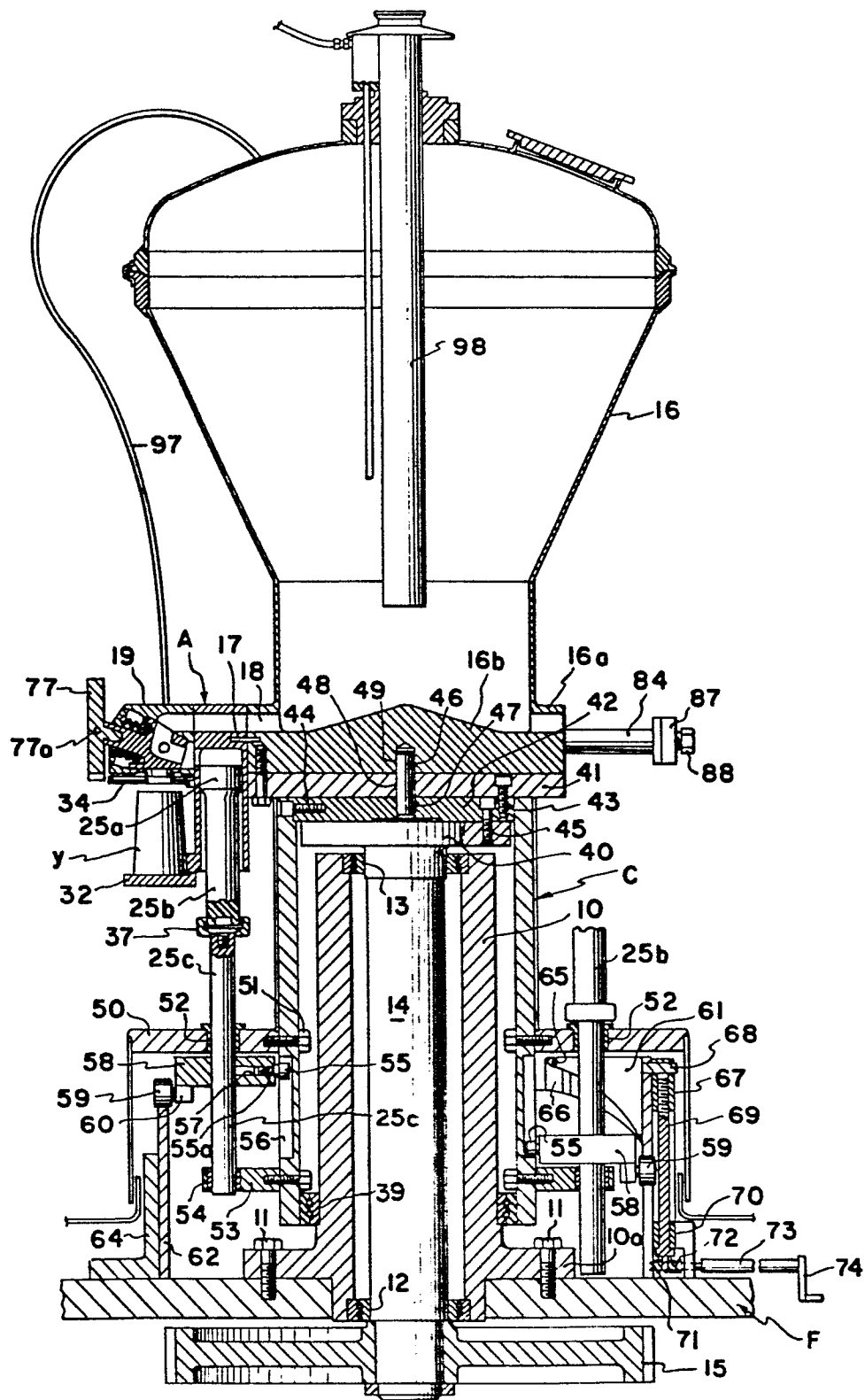
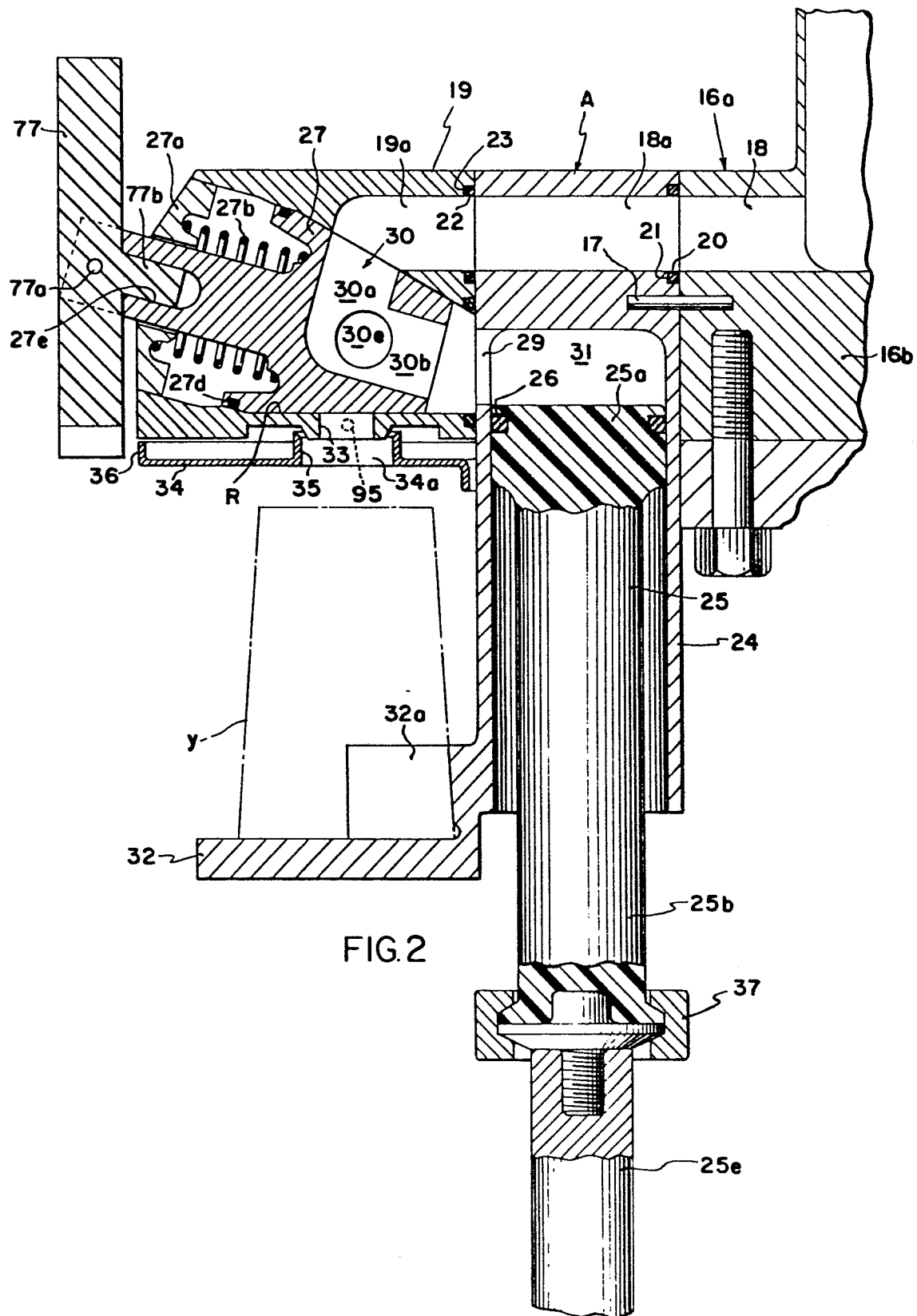
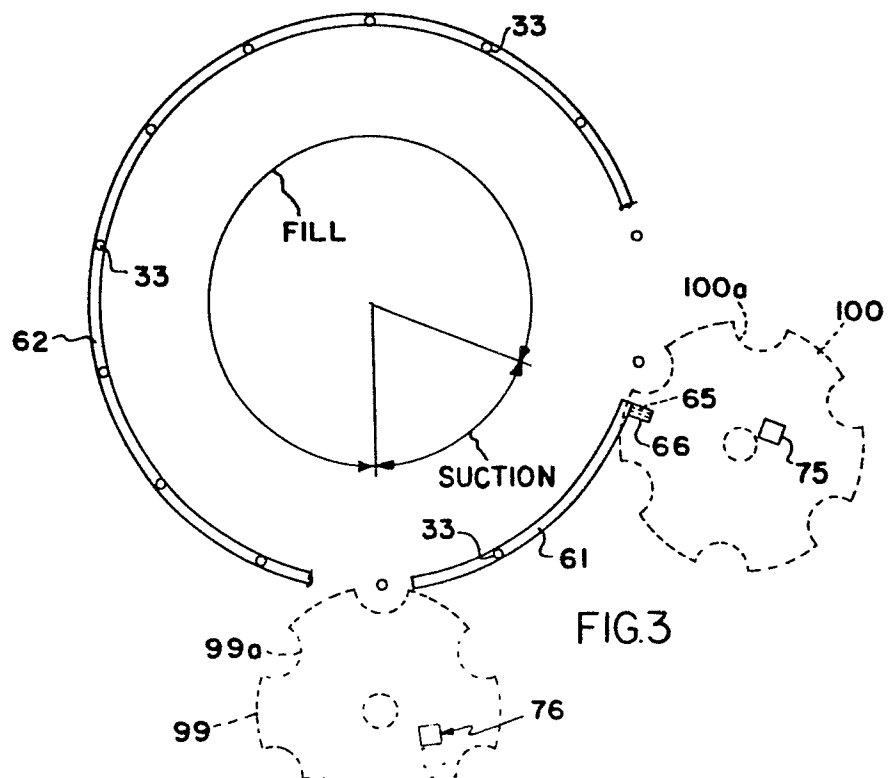
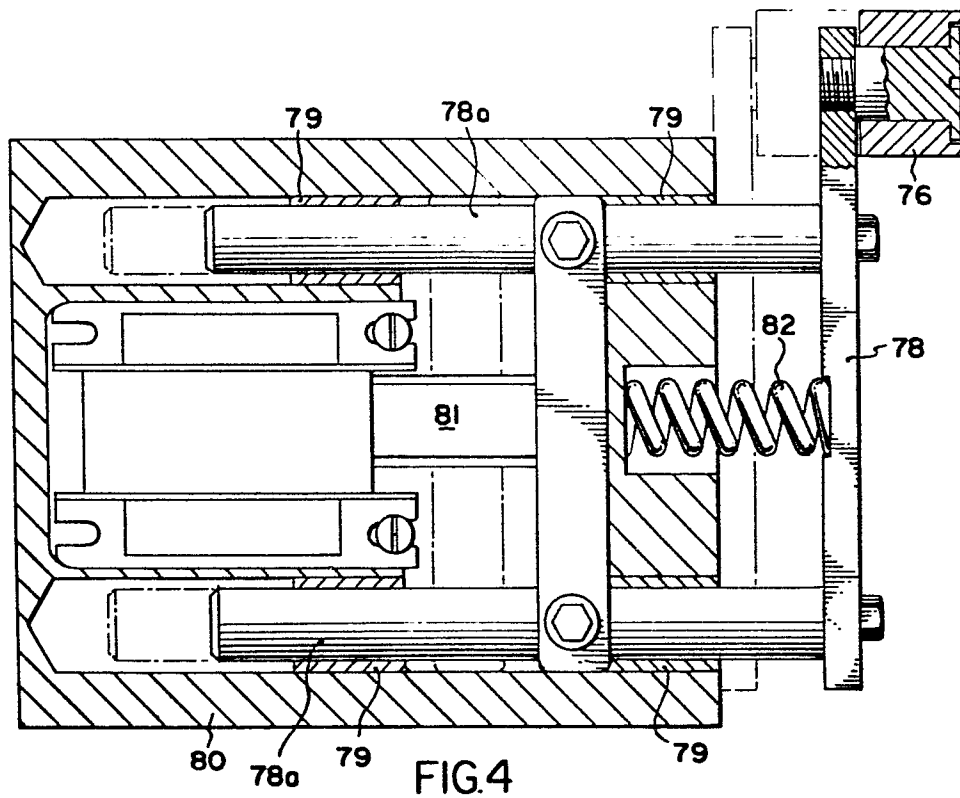


FIG 1





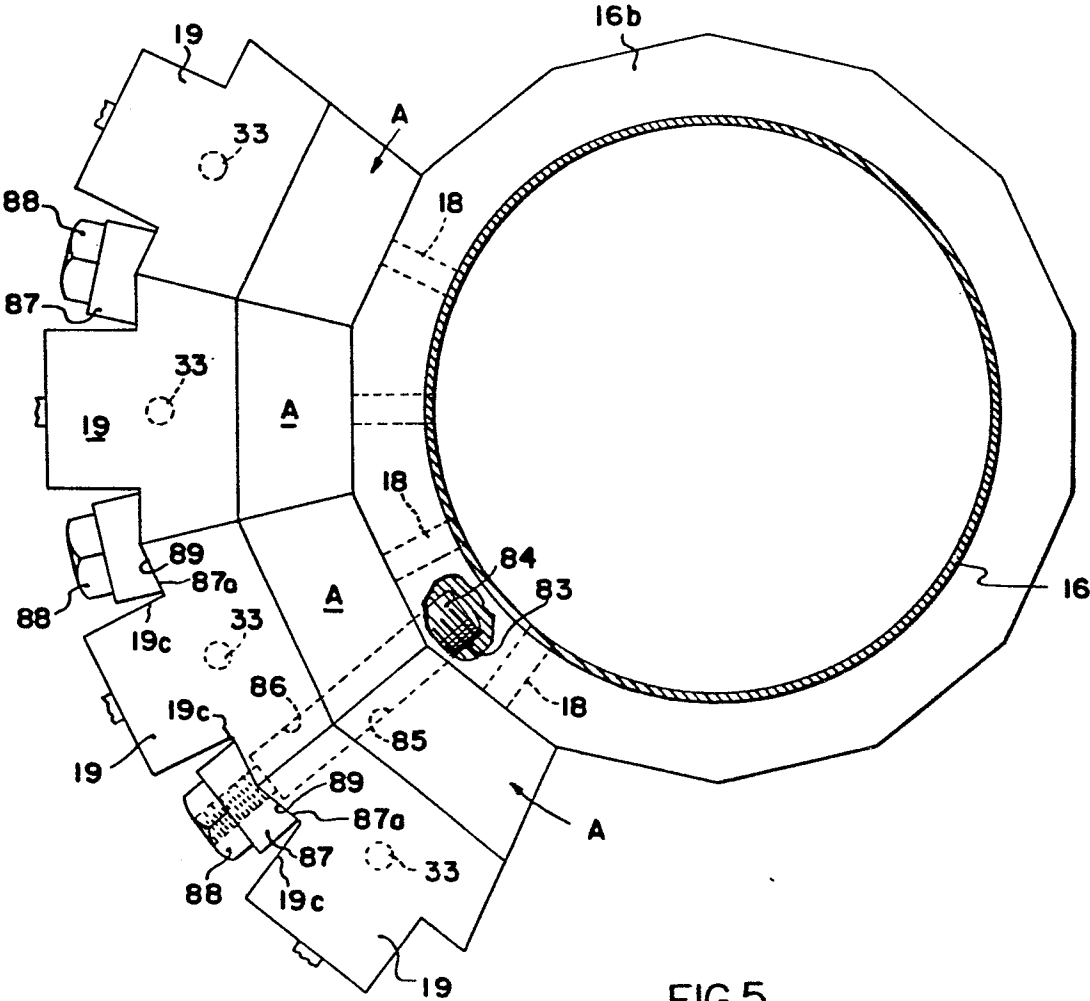


FIG.5

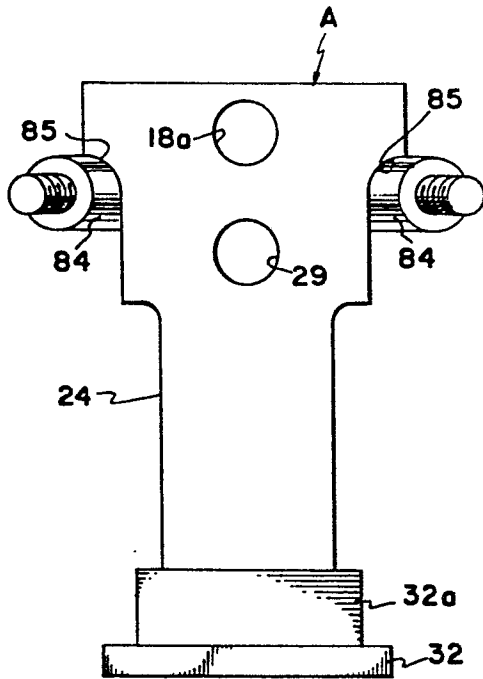


FIG. 6

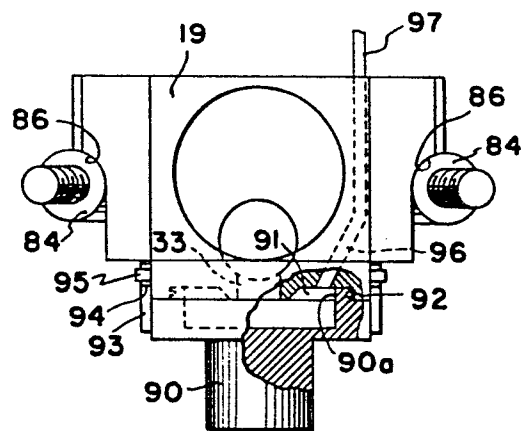


FIG. 7

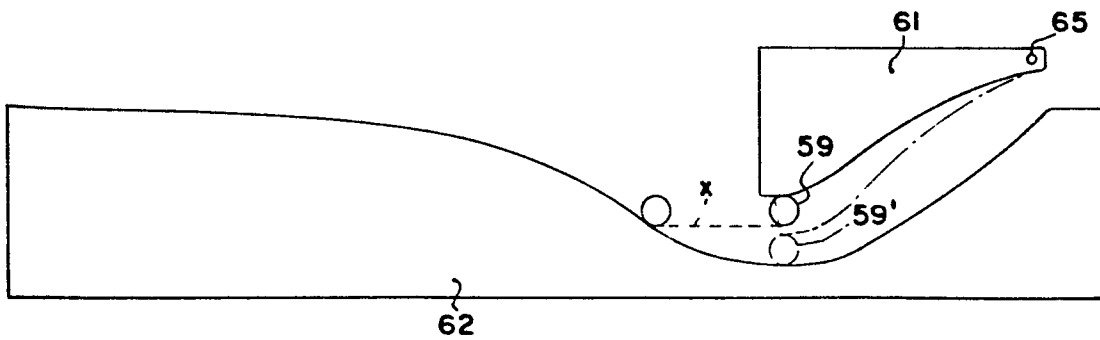


FIG. 8



European Patent
Office

EUROPEAN SEARCH REPORT

0074418

Application number

EP 81107187.7

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	US - A - 3 744 212 (MISTARZ) + Fig. 7-9 + --		B 65 B 3/32 B 65 B 59/04
A	DE - A - 2 317 504 (MATHER & PLATT LTD.) & GB-A-1 383 346 --	1,2,4- 6,8-13	
A	US - A - 4 060 109 (SOTOMA) --	1,2,4- 6,8-13	
A	US - A - 2 958 346 (KERR) + Fig. 9-14 + --	1,2,4- 6,8-13	TECHNICAL FIELDS SEARCHED (Int.Cl. 3)
D,A	US - A - 3 601 288 (BERRY) & GB-A-1 231 550 ----		B 65 B 3/00 B 65 B 57/00 B 65 B 59/00 B 67 C 3/00
			CATEGORY OF CITED DOCUMENTS
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			&: member of the same patent family, corresponding document
X The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 14-05-1982	Examiner MELZER