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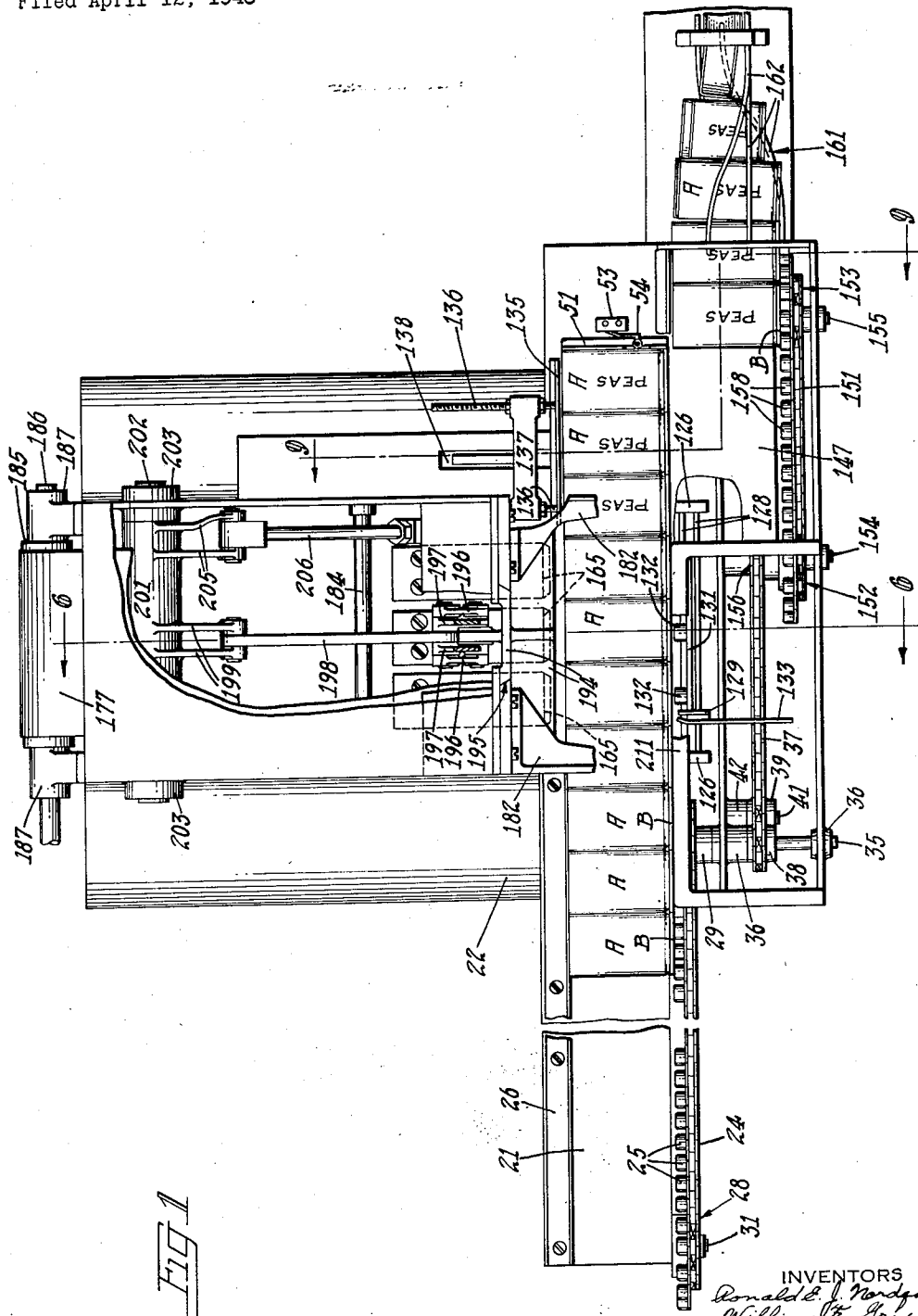
R. E. J. NORDQUIST ET AL

2,567,232

MACHINE FOR PRINTING ON CONTAINERS

Filed April 12, 1948

7 Sheets-Sheet 1



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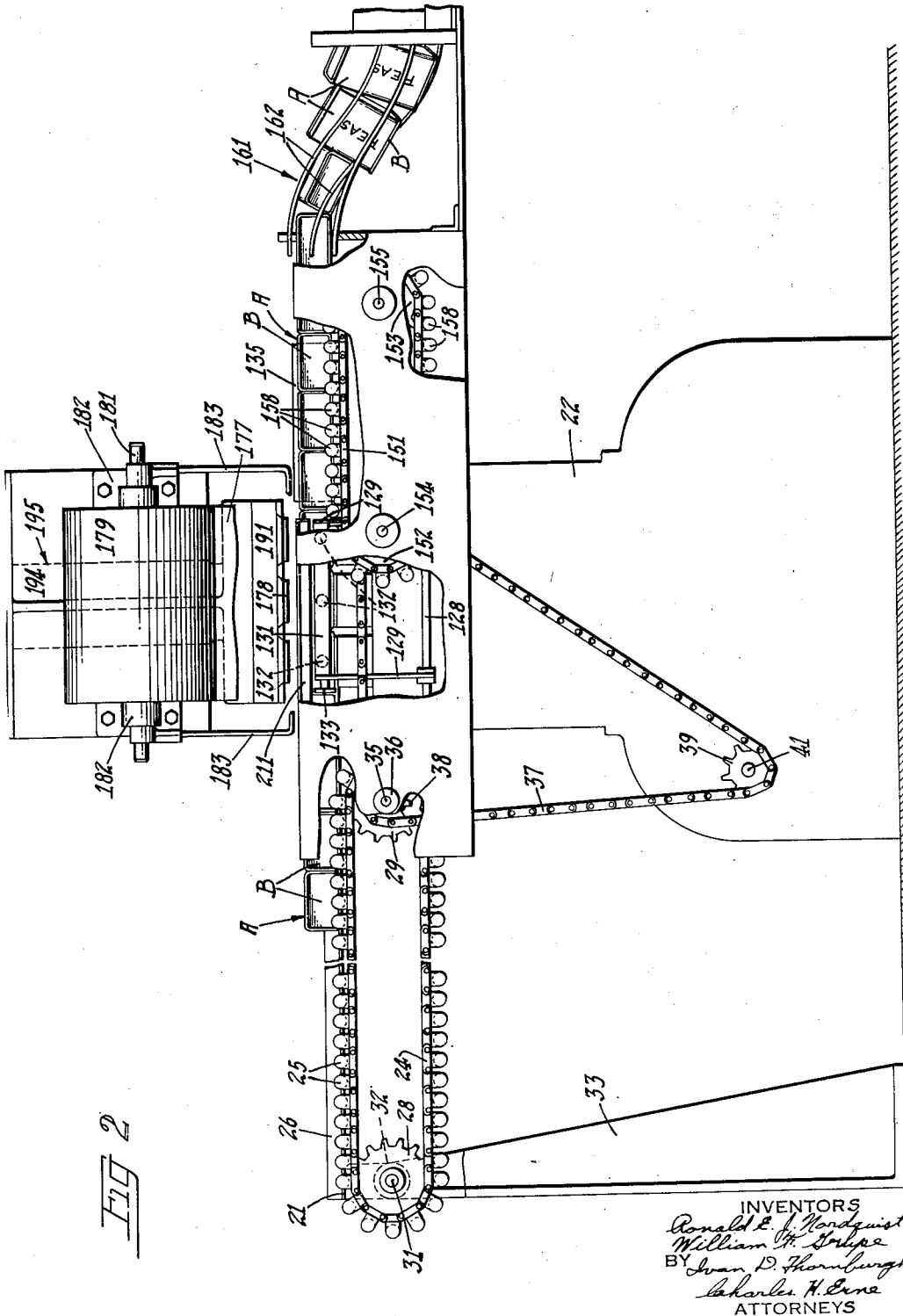
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MACHINE FOR PRINTING ON CONTAINERS

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7 Sheets-Sheet 2

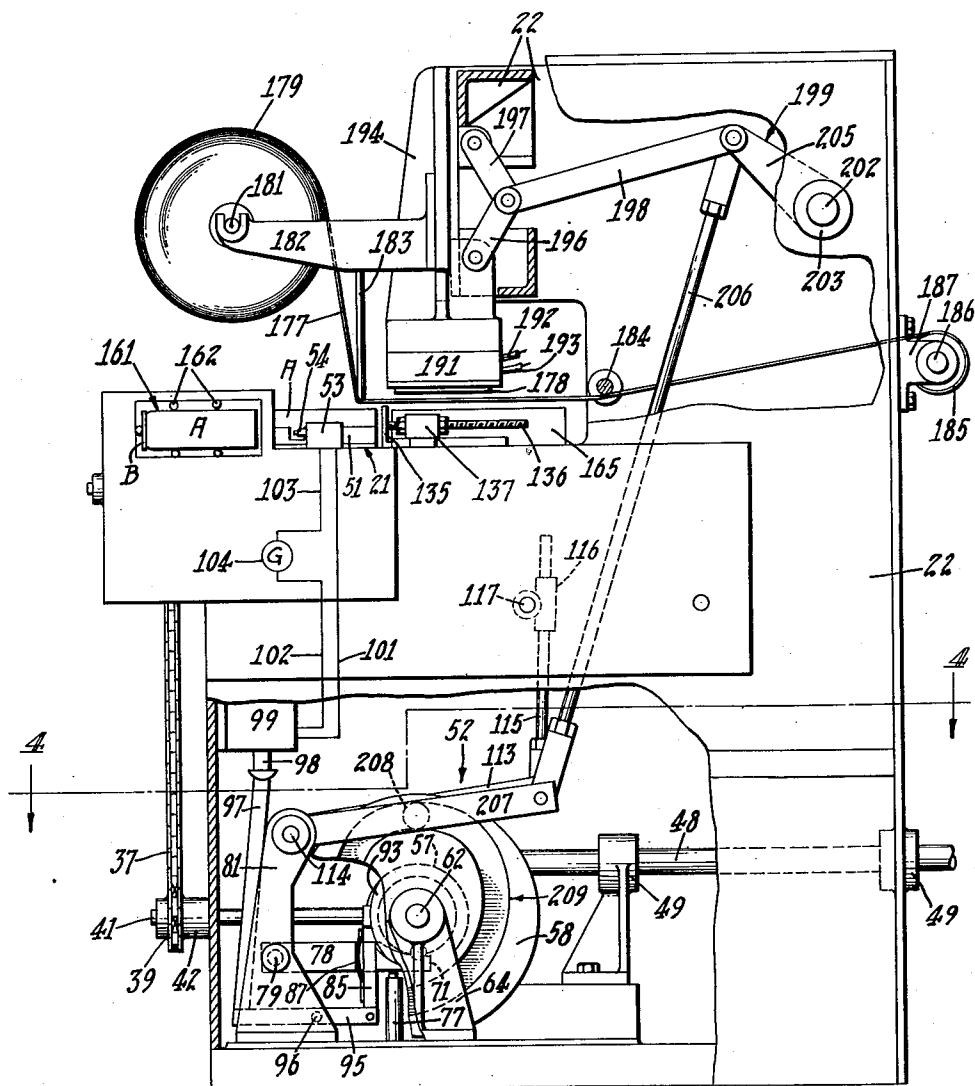


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Fig 3



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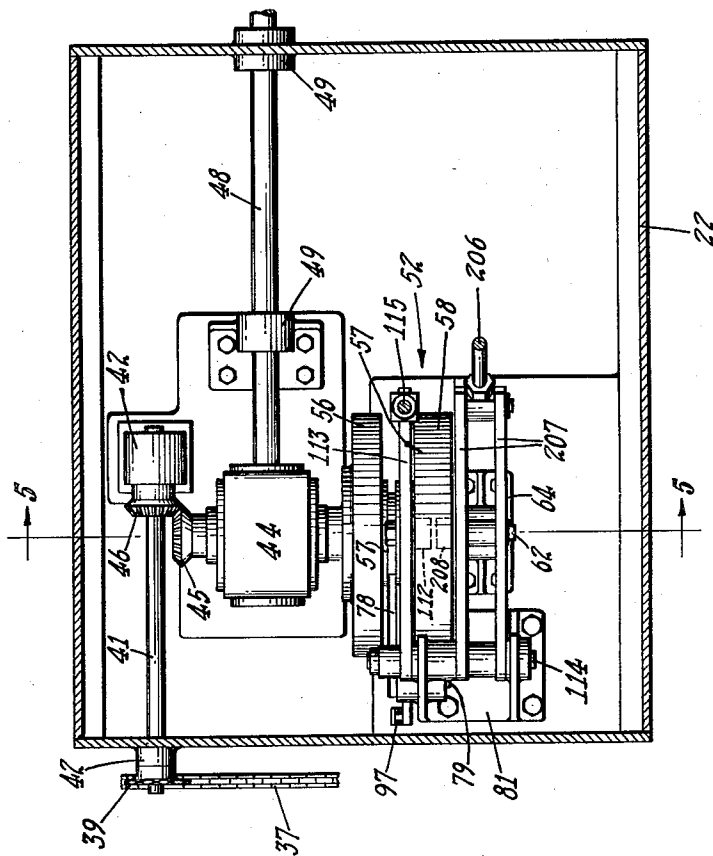
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MACHINE FOR PRINTING ON CONTAINERS

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7 Sheets-Sheet 4



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MACHINE FOR PRINTING ON CONTAINERS

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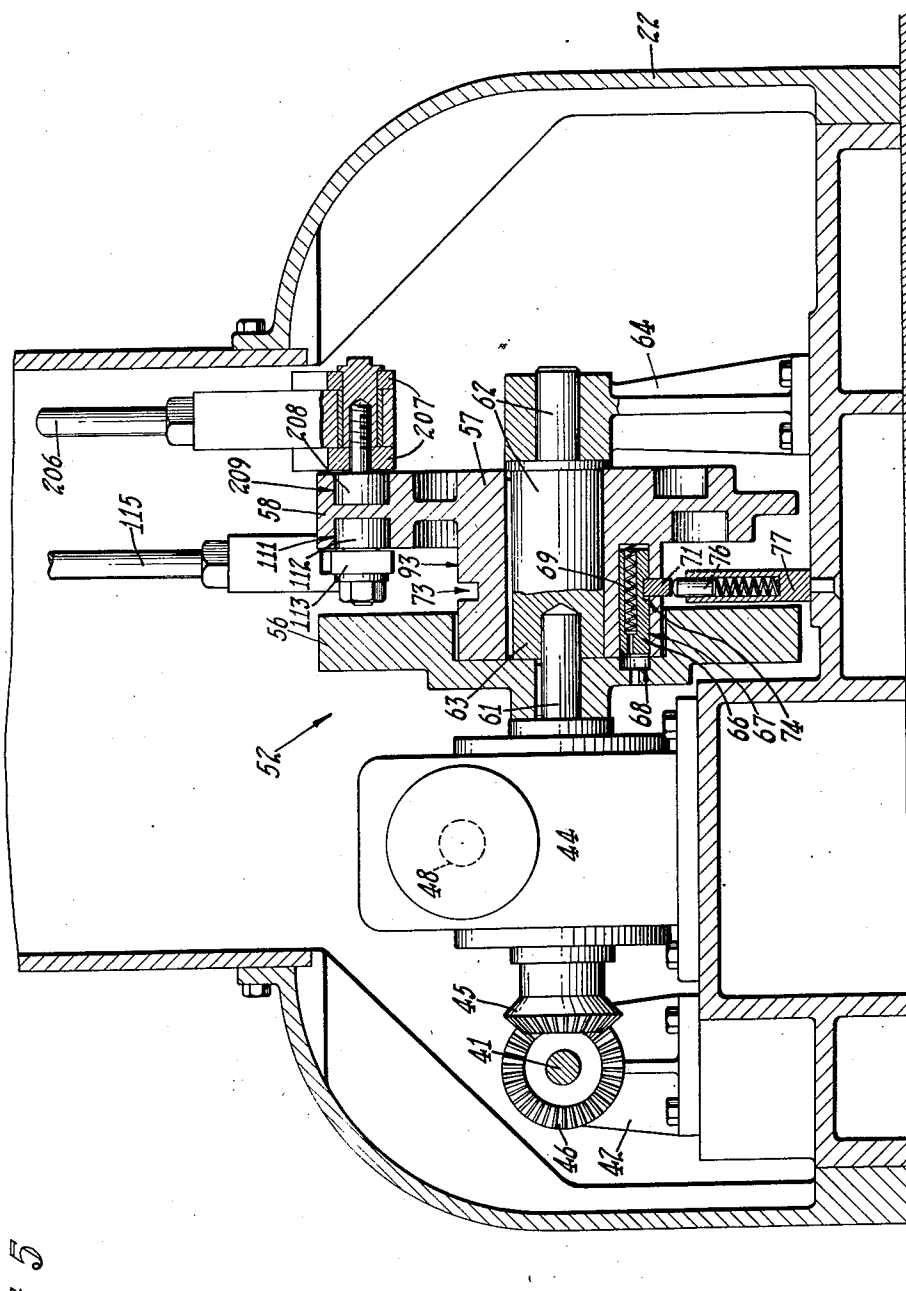


FIG 5

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MACHINE FOR PRINTING ON CONTAINERS

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7 Sheets-Sheet 6

Fig 6

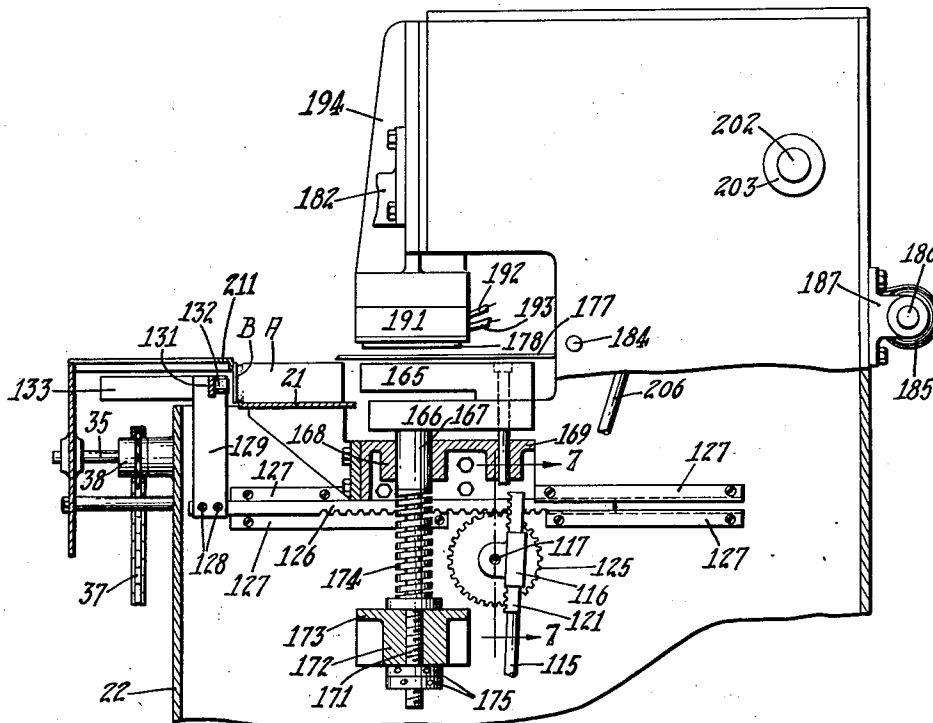
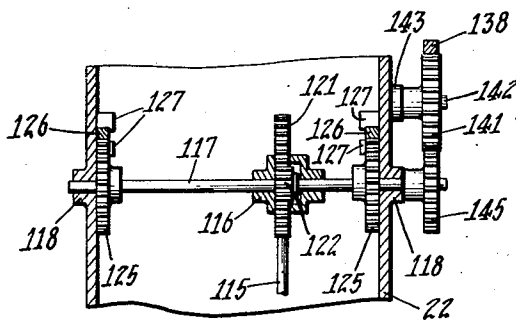


Fig 7



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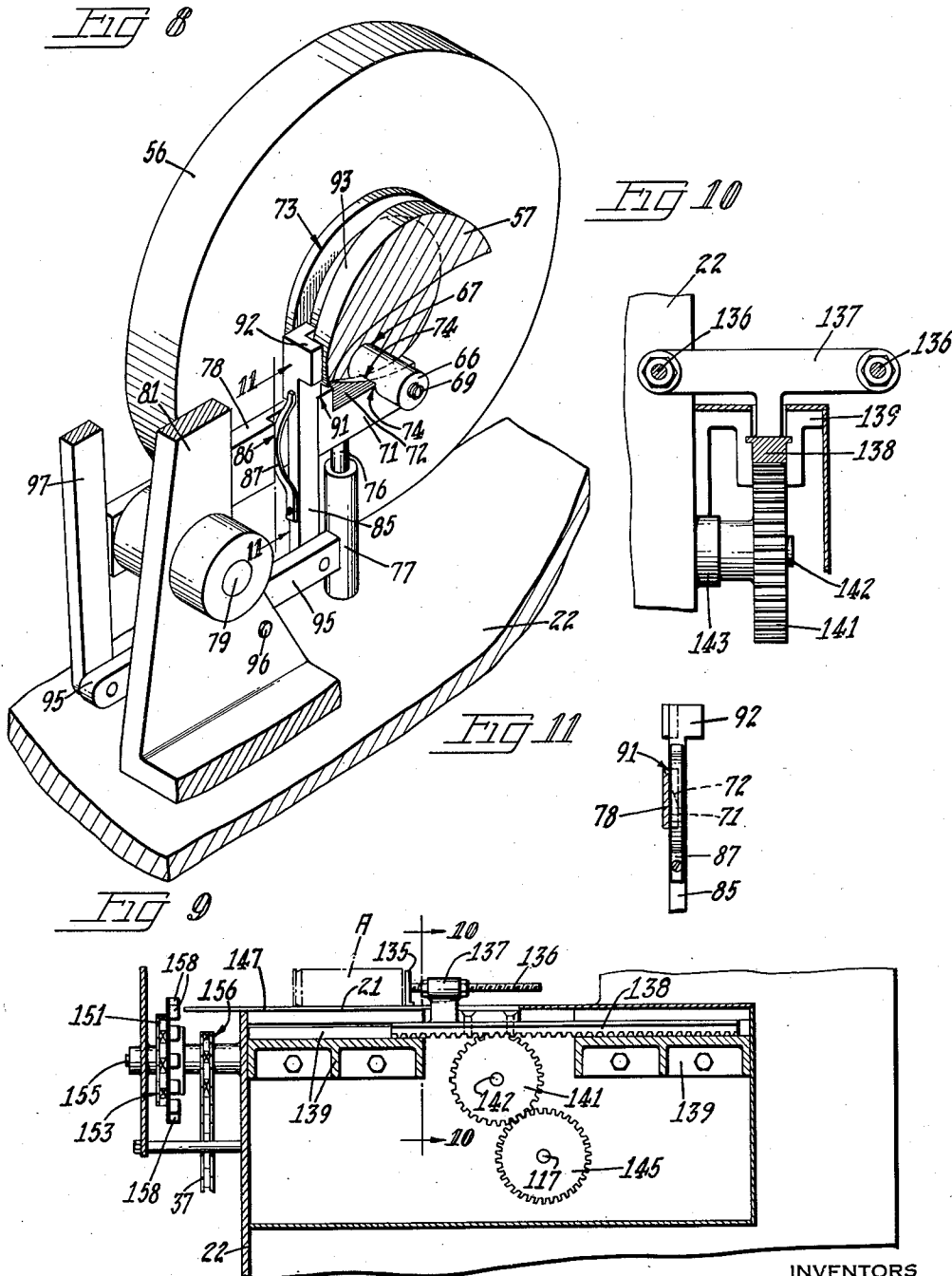
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MACHINE FOR PRINTING ON CONTAINERS

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7 Sheets-Sheet 7



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UNITED STATES PATENT OFFICE

2,567,232

MACHINE FOR PRINTING ON CONTAINERS

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Application April 12, 1948, Serial No. 20,558

6 Claims. (Cl. 101—44)

1

The present invention relates to a printing machine and has particular reference to printing or marking indicia or legends on containers and the like, such as containers for frozen foods, milk, etc.

An object of the invention is the provision of a printing machine for imprinting markings on containers wherein empty, lightweight flexible or easily crushed containers such as fibre containers and the like, may be quickly and clearly marked with desired legends while moving in a procession through the machine so that containers suitable for preserving a variety of products may be economically marked to designate the particular product to be packed in the containers passing through the machine.

Another object is the provision of such a machine wherein a group of the containers may be readily separated from the procession of containers and the containers in the group marked simultaneously so as to expedite the printing operation and to thereby effect high speed rates of production.

Another object is the provision of such a machine wherein each container of a group of empty containers being marked is supported fully and solidly during the marking operation so that irrespective of the flexibility of its walls a full and clear mark may be produced.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a top plan view of a printing machine embodying the instant invention, with parts broken away;

Fig. 2 is a front view of the machine shown in Fig. 1, with parts broken away;

Fig. 3 is an end view of the machine as viewed from the right in Fig. 2, with parts broken away;

Fig. 4 is a horizontal section taken substantially along the broken line 4—4 in Fig. 3;

Fig. 5 is an enlarged sectional view taken substantially along the line 5—5 in Fig. 4, with parts broken away;

Fig. 6 is a part sectional part elevational view taken substantially along the line 6—6 in Fig. 1, with parts broken away;

Fig. 7 is a sectional detail taken substantially along the vertical line 7—7 in Fig. 6 with parts broken away;

Fig. 8 is an enlarged perspective view of a

2

clutch detail shown in Figs. 4 and 5, with parts broken away;

Fig. 9 is a sectional view taken substantially along the line 9—9 in Fig. 1, with parts broken away; and

Figs. 10 and 11 are enlarged sectional details taken substantially along the lines 10—10 and 11—11 in Figs 9 and 8 respectively, parts being broken away.

As a preferred and exemplary embodiment of the invention the drawings illustrate a machine for printing desired indicia such as the name of a product or a packer or producer or other information, onto a side wall of empty rectangular shaped fibre containers A (Figs. 1 and 2) having sheet metal bottoms B attached thereto in a suitable end seam, such as for example, containers used for frozen foods and the like. The top ends of the containers are open.

With such a machine a packer that puts up a variety of products may use a standard labeled or printed container suitable for all varieties of products and print any auxiliary or additional information peculiar to the particular product being packed, at the time or just prior to the product being filled into the containers. Thus by the provision and use of such a machine it is unnecessary for a packer to keep on hand quantities of specially marked containers for all of the varieties of products that he intends to pack. Such an arrangement saves a great deal of time and labor and avoids delays and spoilage.

The empty containers A enter the machine in a horizontal position resting on their flat broad sides, with their open ends facing inwardly and their metal bottoms facing outwardly as shown in Fig. 1. In this position the containers are received on and are propelled along a horizontally disposed table 21 (Figs. 1 and 2) which extends across the front of the machine for its full length. This table is supported on a frame 22 which constitutes the main frame of the machine.

The containers A are propelled along the table 21 in a continuous procession with their narrow side walls touching each other, by an endless chain conveyor 24 which constitutes a feed-in conveyor and which is disposed adjacent the entrance end of the table and extends along its outer edge for substantially one half its length. This feed conveyor carries a plurality of permanent magnets 25 secured thereto at spaced intervals for engagement with the metal bottoms of the containers for advancing the containers along the table. The magnets preferably engage the

end seams which unite the bottoms B to the containers so as to prevent being caught in the countersunk panel usually provided in the container bottoms. A guide rail 26 secured to the inner edge of the table 21 opposite the conveyor 24 guides the containers adjacent their open ends.

The feed-in conveyor 24 operates continuously over an idler sprocket 28 and a driving sprocket 29. The idler sprocket 28 is mounted on a horizontal shaft 31 carried in bearings 32 formed in a support stand 33 which supports the outer overhanging end of the table 21. The driving sprocket 29 is mounted on a horizontal drive shaft 35 journaled in bearings 36 formed in the main frame 22. The drive shaft is continuously rotated by an endless drive chain 37 which operates over a driven sprocket 38 carried on the drive shaft 35 and over a main driving sprocket 39 mounted on the outer end of a driving shaft 41 journaled in bearings 42 (see Figs. 3 and 4) formed in the main frame adjacent its base.

The driving shaft 41 is rotated continuously by a speed reducing mechanism enclosed in a housing 44 (Figs. 4 and 5) and includes a bevel gear 45 which meshes with a bevel gear 46 carried on the driving shaft 41. The speed reducing mechanism is actuated by a continuously rotating main shaft 48 which is journaled in bearings 49 formed in the main frame 22. This main shaft is driven in any suitable manner.

Hence through the above described connection with the main shaft 48, the feed-in conveyor 24 advances a line of containers across the front of the machine along the table 21 for its full length. Since the feed-in conveyor extends for substantially one half this length, the containers beyond the conveyor are advanced by contact with each other, a following container pushing a leading container across the table until at least six of such containers are free of the conveyor.

With the portion of the table 21 beyond the feed-in conveyor 24 thus filled with containers, the leading container engages against a stop plate 51 adjustably secured to the table. This stop plate arrests further advancement of the entire line of containers in the machine. However the feed-in conveyor 24 continues to operate, the magnets 25 sliding along the end seams of the bottoms B of the containers at rest adjacent the conveyor.

While the procession of containers A is temporarily at rest, a group of the three leading containers is pushed outwardly, laterally of the procession as viewed in Fig. 1 for discharge from the machine, while simultaneously a second group of the next three containers is pushed inwardly, laterally of the procession for a printing operation, the remainder of the procession of containers being restrained from advancement. Following the printing operation, the printed containers are returned to the procession, and the procession permitted to advance until the leading printed container engages against the stop plate 51. This is followed by a repetition of the above operations in which advancement of the procession is arrested, the three leading printed containers being discharged from the procession and the three next following containers being displaced from the procession for printing at the printing station and then returned to the procession for advancement to the discharge station. In this manner the containers advance through the machine, are printed, and are then discharged to any suitable place of deposit.

This cycle of operations is effected in timed or-

der by a one revolution clutch 52 (Figs. 3, 4 and 5) which is controlled by a normally open electric switch 53 (Figs. 1 and 3) secured to the stop plate 51. The switch is provided with a movable element 54 which is engaged by the leading container A in the procession when it contacts the stop plate and thus closes the switch. It is the closing of this switch that starts the cycle of operations of the machine.

The one revolution clutch 52 includes a continuously rotating drive member 56 (Figs. 4, 5 and 8) and a normally stationary driven member 57 formed with a double face cam 58. The drive member 56 is mounted on and is rotated by a short drive shaft 61 (Fig. 5) of the speed reducing mechanism 44. The driven member 57 is mounted on a short shouldered driven shaft 62 which forms a free continuation of the drive shaft 61, the inner end of the driven shaft 62 being formed with a loose bearing 63 for the drive shaft 61. The outer end of the driven shaft 62 is carried in a bearing bracket 64 bolted to the base of the main frame 22.

The driven member 57 carries a driving pin 66 (Fig. 5) which is slideably disposed in a horizontal bore 67 formed in the member. The inner end of the driving pin is disposed in radial alignment with a driving bore 68 formed in the adjacent face of the drive member 56. A compression spring 69 housed within the driving pin 66 and pressing against the driven member 57 urges the pin toward the drive member 56.

The driving pin 66 is normally held in a retracted position free of the drive member 56 by a yoke 71 having a curved tapered face 72 (see Figs. 5, 8 and 11) which is disposed in an annular groove 73 formed in the outer periphery of the driven member 57. This face of the yoke extends into a segmental groove 74 formed in the driving pin and thus holds the pin in place. The yoke is held in place by a spring barrel 76 which engages under the yoke and which is disposed in a hollow support 77 secured to the base of the main frame 22. The yoke is formed on the free end of an arm 78 which is mounted on a pivot pin 79 carried in a bracket 81 bolted to the base of the main frame 22.

The driven member 57 is periodically rotated by the drive member 56 through the driving pin 66 by the automatic tripping or release of this pin. This release of the driving pin 66 is brought about by an upright trip member 85 which extends up through a wide groove 86 formed in a side of the yoke arm 78 (see Fig. 8). The groove is considerably wider than the arm. A flat spring 87 secured to the back edge of the trip member and disposed in the wide groove 86, between the member and the yoke arm, presses the member forwardly toward the yoke 71. The inner edge of the trip member 85 is formed with a release shoulder 91 (Fig. 8) which is normally held in overhanging engagement with the yoke 71 adjacent the wide groove 86, by the flat spring 87.

Adjacent its upper end, the trip member 85 engages in the groove 73 of the driven member 57 for locating and retaining the member against lateral displacement. This end of the member is formed with a shoe 92 which rides against an edge cam 93 formed on the driven member 57 (see Fig. 3).

The lower end of the trip member 85 is pivotally connected to a rocker bar 95 (Fig. 8) which intermediate it ends is mounted on a pivot stud 96 secured in the bracket 81. The outer end of the rocker bar is pivotally connected to a link

5

97 which extends up above the clutch device and at its upper end is secured to a movable core 98 (see Fig. 3) of a normally de-energized electric solenoid 99. This solenoid is connected to the switch 53 by an electric circuit which includes lead wires 101, 102, 103 which connect the solenoid and the switch to a suitable source of electric current such as a generator 104.

Hence when the switch 53 is closed by the pressure of the leading container A in the procession of containers in the machine, the solenoid 99 is energized and this draws its core 98 upwardly. The solenoid remains energized as long as a container is in place against the switch element 54. Upward movement of solenoid core 98 lifts the link 97 and this rocks the rocker bar 95 and thus draws down on the trip member 85.

This downward movement of the trip member 85, through its release shoulder 91 pulls down on the yoke 71 and thus withdraws the yoke from the segmental groove 74 in the driving pin 66. The driving pin is thus released and under the pressure of its compression spring 69 is urged inwardly into engagement with the face of the continuously moving drive member 56.

When the bore 68 of the drive member comes into register with the driving pin 66, the pin enters the bore and thus the drive member 56 and the driven member 57 become locked together and rotate as a unitary structure through one complete revolution. At the termination of this single revolution, the driven member 57 is disconnected from the drive member 56 and the driven member thus ceases rotation while the drive member continues to rotate.

Release of the driven member 57 from the drive member 56 is brought about through the yoke 71. For this purpose the edge cam 93 on the driven member 57 pushes the trip member 85 outwardly against the resistance of its flat spring 87, as soon as the driven member begins to rotate with the drive member, and this forces the release shoulder 91 of the trip member out of engagement with the yoke 71. The yoke thereupon is pushed upwardly into its original position in the path of travel of the driving pin 66, by the pressure of the yoke spring barrel 76 (Fig. 5).

Hence when the driving pin 66, during its travel with the driving member 56 through one revolution, comes adjacent the tapered curved face 72 of the released yoke 71, the segmental groove 74 in the driving pin rides onto the tapered face 72 and the pin is thus shifted endwise. This shifting of the pin withdraws it from the drive member 56 and returns it to its original position and this disconnects the drive member 56 from the driven member 57. The driven member immediately stops rotating and remains stationary until the next energization of the solenoid 99. During this cycle of operation the solenoid 99 becomes de-energized by the discharge of the printed containers as mentioned above and this permits the solenoid core 98 and link 97 to fall and thus raise the trip member 85 to its original position engaged with the yoke 71 for a repeat operation.

During the one revolution cycle of operation of the clutch 52 as described above, the double face cam 58 formed on the driven member 57 and rotating therewith actuates the mechanism for discharging the group of printed containers and for displacing the next group of containers for printing as explained above. For this purpose one face of the double face cam 58 is formed with

6

a cam groove 111 (Fig. 5) which controls a cam roller 112 carried on a lever 113 (Fig. 3) mounted on a pivot pin 114 retained in the bracket 81.

The outer end of the lever 113 is pivotally connected to an upwardly extending link 115, the upper end of which is slideably disposed in a housing 116 (see Figs. 6 and 7) which surrounds a horizontal gear shaft 117 carried in a pair of spaced bearings 118 formed in the main frame 22. This upper end of the link 115 is formed with a rack 121 which meshes with a pinion 122 disposed within the housing 116 and secured to the gear shaft 117.

Hence during the rotation of the clutch cam 58, its cam groove 111 raises and lowers the rack 121 at the proper time and thus through the pinion 122 rotates the gear shaft 117, first in a clockwise direction, as viewed in Fig. 6, through an operating movement and then in a reverse direction through a return movement. During the operating movement of the gear shaft 117, the group of containers A to be printed are shifted transversely out of the procession of containers on the table 21 and are deposited in the printing station. For this purpose the gear shaft 117 carries a pair of spaced actuating gears 125 (Figs. 6 and 7) which mesh with a pair of spaced and parallel horizontal racks 126 which operate in upper and lower slideways 127 secured to the main frame 22.

The outer ends of the racks 126 extend beneath the table 21 and carry a pair of spaced and parallel tie rods 128 (see also Figs. 1 and 2) which span the space between the racks, the ends of the tie rods being secured in the racks. These tie rods support a pair of upright pusher legs 129 which at their upper ends carry a cross beam 131 extending from one leg to the other and having a plurality of permanent pusher magnets 132 secured thereto. The magnets 132 are disposed in alignment with and in spaced relation to the metal bottoms B of the containers A opposite the printing station.

Hence when the gear shaft 117 rotates through an operating movement as explained above, the actuating gears 125 slide the racks 126 toward the right as viewed in Fig. 6 and this advances the pusher magnets 132 into engagement with the bottoms B of the group of containers opposite the printing station and continues to push this group of containers across the table 21 out of the procession of containers and into the printing station to be printed as will be hereinafter explained.

During this advancement of the pusher magnets 132, their supporting legs 129 pass through clearance slots formed in the table to permit full travel of the magnets. The following containers in the line are restrained from further advancement by a retaining plate 133 (Figs. 1, 2 and 6) which is secured to the adjacent pusher leg 129 and which moves into place in front of the remaining procession of containers when the pusher magnets 132 move inwardly.

Simultaneously with this insertion of the group of containers to be printed, into the printing station, the leading group of containers which have been previously printed are pushed laterally out of the procession of containers in the opposite direction for discharge from the machine. This movement of the printed group of containers is effected by a discharge pusher plate 135 (Figs. 1, 2 and 9) which is disposed adjacent the printing station side of the path of travel of the procession

of containers and on a level just above the table 21.

The pusher plate 135 is mounted on a pair of adjusting screws 136 carried in a support member 137 (see also Fig. 10) bolted to a horizontal rack 138. The rack is slideably carried in a pair of runway brackets 139 secured to main frame 22. The rack meshes with an idler gear 141 mounted on a short shaft 142 carried in a bearing 143 formed on the main frame 22. The idler gear 141 meshes with and is rotated by a gear 145 (see also Fig. 7) carried on the outer end of the gear shaft 117.

Hence the rack 138 moves in unison with the racks 126 but in the opposite direction and during an operating movement shifts the pusher plate 135 outwardly against the leading or printed group of containers A and thus pushes these containers out of the procession of containers. The displaced containers slide across a lateral extension 147 (Fig. 1) of the table 21 and are pushed into engagement with a continuously operating discharge conveyor 151 (Figs. 1, 2 and 9).

The discharge conveyor 151 is of the endless chain variety and operates over a pair of spaced sprockets 152, 153 mounted on shafts 154, 155 journaled in bearings formed in the main frame 22. The conveyor is operated by a sprocket 156 (Figs. 1 and 9) which is rotated by the drive chain 37. This conveyor carries a plurality of spaced permanent magnets 158 which attract the metal bottoms B of the shifted group of printed containers and thus hold them while advancing them laterally into a discharge chute 161 comprising a plurality of guide rails 162 secured to the main frame 22. These guide rails guide the containers to any suitable place of deposit.

Returning now to the printing station hereinbefore mentioned, the containers A in the group shifted out of the procession for printing, are telescoped over a plurality of anvils or horns 165 (Figs. 1 and 6) which are disposed in spaced relation so as to receive the containers without disturbing their contiguous positions. There is one anvil for each container. These anvils are secured to a bed plate 166 (Fig. 6) mounted on the upper end of a vertical post 167 which is carried in a slide bearing 168 formed in a horizontal web 169 of the main frame 22.

Below the bearing 168 the post 167 is formed with a reduced diameter stem 171 which extends down through a boss 172 on a horizontal web 173 of the frame. A compression spring 174 interposed between the post 167 and the boss 172 and surrounding the stem 171 provides a yieldable mounting for the anvils or horns 165. Lock nuts 175 threadedly connected onto the lower end of the stem 171 are provided for vertical adjustment of the anvils.

Telescoping of the containers A over the anvils or mandrels 165 for the printing operation is effected by the pusher beam 131 and its attached magnets 132. The beam remains in position with its magnets 132 in contact with the containers during the printing operation and thus locates and holds the containers in proper position on the anvils.

Printing of the containers is effected through a colored ribbon 177 (Fig. 3) by heated dies 178 disposed above the anvils 165. The ribbon 177 is passed between the anvils and the dies from a supply roll 179 carried on a rod 181 the ends of which are supported in brackets 182 secured to an upper overhanging portion of the main frame 22. The ribbon from the roll extends down un-

der a guide 183 secured to the brackets 182, then passes under the dies 178 and an auxiliary guide rod 184 secured in the main frame and is wound in any suitable manner onto a roll 185 mounted on a rod 186 carried in brackets 187 bolted to the back of the main frame.

The printing dies 178 are secured to the bottom of a head 191 (Figs. 2, 3 and 6) which contains an electric heating element connected by lead wires 192, 193 to any suitable source of electric current, although any other heating medium such as steam, hot oil, hot water or the like may be used if desired. The heated head 191 maintains the dies 178 in a heated condition. This head is secured to a vertical slide 194 which operates in a dovetail slideway 195 (see also Fig. 1) formed in the upper overhanging portion of the frame 22.

The slide 194 is lowered through a printing stroke and raised through a return stroke by co-operating pairs of toggle links 196, 197 (Figs. 1 and 3). The outer ends of the links 196 are pivotally connected to the slide while the outer ends of the links 197 are pivotally connected to the main frame 22 as best shown in Fig. 3. The inner ends of both sets of links 196, 197 are pivotally connected to one end of a rod 198. The opposite end of the rod is pivotally connected to a pair of arms 199 (Fig. 1) formed on a long hub 201 mounted on a pivot pin 202 the ends of which are carried in bearings 203 formed in the main frame 22.

The hub 201 is further formed with a pair of actuating arms 205 (Figs. 1 and 3) which are pivotally connected to the upper end of an actuating rod 206 which extends down towards the one revolution clutch 52. At its lower end the actuating rod 206 is pivotally connected to a pair of parallel levers 207 mounted on the pivot pin 114 in the bracket 81. One of the levers, intermediate its ends, carries a cam roller 208 (see also Figs. 4 and 5) which operates in a cam groove 209 formed in the outer face of the double faced clutch cam 58.

Hence while the containers A to be printed are held in position on the anvils 165 the cam groove 209 in the clutch cam 58 draws down on the actuating rod 206 and thus forces the toggle links 196, 197 outwardly with the result that the slide 194 is moved down through a printing stroke. During this downward movement of the slide, the heated dies 178 move down against the ribbon 177 and press the ribbon against the containers on the anvils 165. It is this action that prints the desired indicia on the containers. Any overthrow of the slide is taken up by the spring 174 (Fig. 6) under the anvil bed plate 166. The slide 194 then moves up through a return stroke and thus withdraws the dies from the printed or marked containers. This completes the printing operation.

As soon as the dies 178 are clear of the printed containers, the pusher beam 131 and its magnets 132 move outwardly through a return stroke. During this return stroke, the magnets 132 withdraw the printed containers from the anvils 165 and return them to their original position in the procession of containers on the table 21. When the containers are in fully restored position, they engage against a stripper bar 211 (Figs. 1, 2 and 6) secured to the main frame 22 adjacent the path of travel of the procession of containers. This stripper bar arrests further outward movement of the containers and thus permits the magnets 132 to detach themselves from the bottoms of the containers. The containers are thus free

for advancement along the table with the procession of held-back containers.

During this return of the printed containers to the procession of containers, the retaining plate 133 (Fig. 1) moves back to free the held-back containers. The discharge pusher plate 135 also returns empty to its original position. This return of the pusher beam 131 and the pusher plate 135 completes the one revolution cycle of operation of the clutch 52 and also permits the feed-in conveyor 24 to resume advancement of the containers.

Thus the unprinted containers push the group of printed containers along the table 21 into the space left by the discharge of the leading group of containers, until the leading printed container engages the stop plate 51. This arrests further advancement of the procession of containers and also closes the electric switch 53 which controls the one revolution clutch 52. The closing of this switch again sets the one revolution clutch 52 into motion and hence a repeat cycle of operations is effected as explained above.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention, or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

We claim:

1. In a machine for printing on empty flexible walled containers having a part responsive to magnetic attraction, the combination of an anvil for supporting the walls of said containers, magnetic means movable toward and away from said anvil for engaging the magnetizable portion of a container to telescope the flexible wall of the container over said anvil and for removing the container from said anvil by a pulling away of the engaged magnetizable portion, and a printing die movable toward and away from said anvil for printing on a said telescoped wall of said container while the latter is held over said anvil.

2. In a machine for printing on empty open ended flexible walled containers having closed bottom ends responsive to magnetic attraction, the combination of a support for receiving a container to be printed with its bottom end in one direction, an anvil disposed adjacent said support and adjacent the open end of a container on the support, a pusher beam located adjacent the bottom end of the container and movable toward and away from said anvil for shifting a received container from said support and for inserting its open end in telescoping position over said anvil, a magnet carried by said pusher beam for engaging the bottom end of said container for locating and holding the container on said anvil and for removing it from said anvil, and a printing die movable toward and away from said anvil and engageable against a flexible wall of said container for printing on said container while it is over said anvil.

3. In a machine for printing on empty containers having a part responsive to magnetic attraction, the combination of a support for receiving containers to be printed, a conveyor disposed adjacent said support, a plurality of magnets carried by said conveyor and engageable with containers on said support for magnetically holding said received containers and for advancing them in a procession along said support, an

anvil disposed adjacent the path of travel of said containers, pusher means disposed opposite said anvil and movable toward and away from said anvil for pushing a container off of said conveyor magnets and out of said procession of containers and for telescoping it over said anvil, magnets carried by said pusher means and engaging said container for removing it from said anvil and for returning it to its original position in said procession of containers with the return movement of said pusher means, and a printing die movable toward and away from said anvil for printing on said container while the latter is over said anvil.

4. In a machine for printing on empty containers having a bottom end responsive to magnetic attraction, the combination of a support for receiving containers with their bottom ends along one side, a conveyor disposed at the side of said support adjacent the container bottoms, said conveyor having magnets for engaging the container bottoms and for advancing a procession of said containers along said support, an anvil disposed at a printing station adjacent the path of travel of said containers, pusher means disposed opposite said anvil and movable toward and away from said anvil, said means having magnets for engaging a container bottom for pushing a container out of said procession and for telescoping it over said anvil and for removing it from said anvil and for returning it to its original position in said procession of containers, a stripper bar carried on said support for stripping the printed container from said pusher magnets when the container is returned, a printing die movable toward and away from said anvil for printing on said container while the latter is over said anvil, means disposed adjacent said path of travel of said containers at a discharge station for forcing a printed container out of said procession of containers for discharge from the machine, a discharge conveyor disposed adjacent said discharge station, and a plurality of magnets carried on said discharge conveyor for engaging the bottom of a displaced printed container for discharging it from the machine.

5. In a machine for printing on empty containers having an open end and a bottom end responsive to magnetic attraction, the combination of a support for receiving containers to be printed with their bottom ends facing in the same direction, feeding means including a chain conveyor carrying magnets operable adjacent the bottom ends of the containers for advancing a procession of said containers along said support, an anvil disposed at a printing station on the side of the open ends of the containers and adjacent the path of travel of said containers, a pusher beam disposed opposite said anvil and movable toward and away from said anvil for pushing a container out of said procession of containers and for telescoping it over said anvil, said pusher beam carrying magnets engageable with the bottom end of the container for pulling the container from said anvil and for returning it to its original position in said procession of containers, a printing die movable toward and away from said anvil for printing on said container while the latter is over said anvil, a pusher plate disposed adjacent said path of travel of said containers at a discharge station for forcing a printed container out of said procession of containers for discharge from the machine, and a double cam for actuating said pusher beam,

11

said pusher plate, and said printing die in timed relation.

6. In a machine for printing on empty open ended containers, the combination of a support for receiving transversely disposed containers to be printed with their open ends disposed in the same direction, continuous feeding means operable adjacent the closed ends of said containers for advancing a procession of said containers along said support, a plurality of anvils disposed alongside of the open ends of said containers adjacent the path of travel of said containers at a printing station, means adjacent an end of said support for arresting the advancement of said procession of containers without stopping said feeding means, a pusher beam alongside of the closed ends of said containers on said support and movable toward and away from said anvils for pushing a group of containers out of said procession and for telescoping their open ends simultaneously over said anvils and for removing them simultaneously from said anvils and for returning them to their original positions in said procession of containers, means mounted on said pusher beam unit and movable across the path of travel of the containers on said support for holding back the incoming con-

12

tainers adjacent said displaced group of the containers while the latter are out of position, a plurality of printing dies movable toward and away from said anvils for printing on said displaced containers while they are over said anvils, and a pusher plate disposed adjacent said path of travel of said containers at a discharge station located beyond said printing station for pushing a group of printed containers out of said procession of containers for discharge from the machine.

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