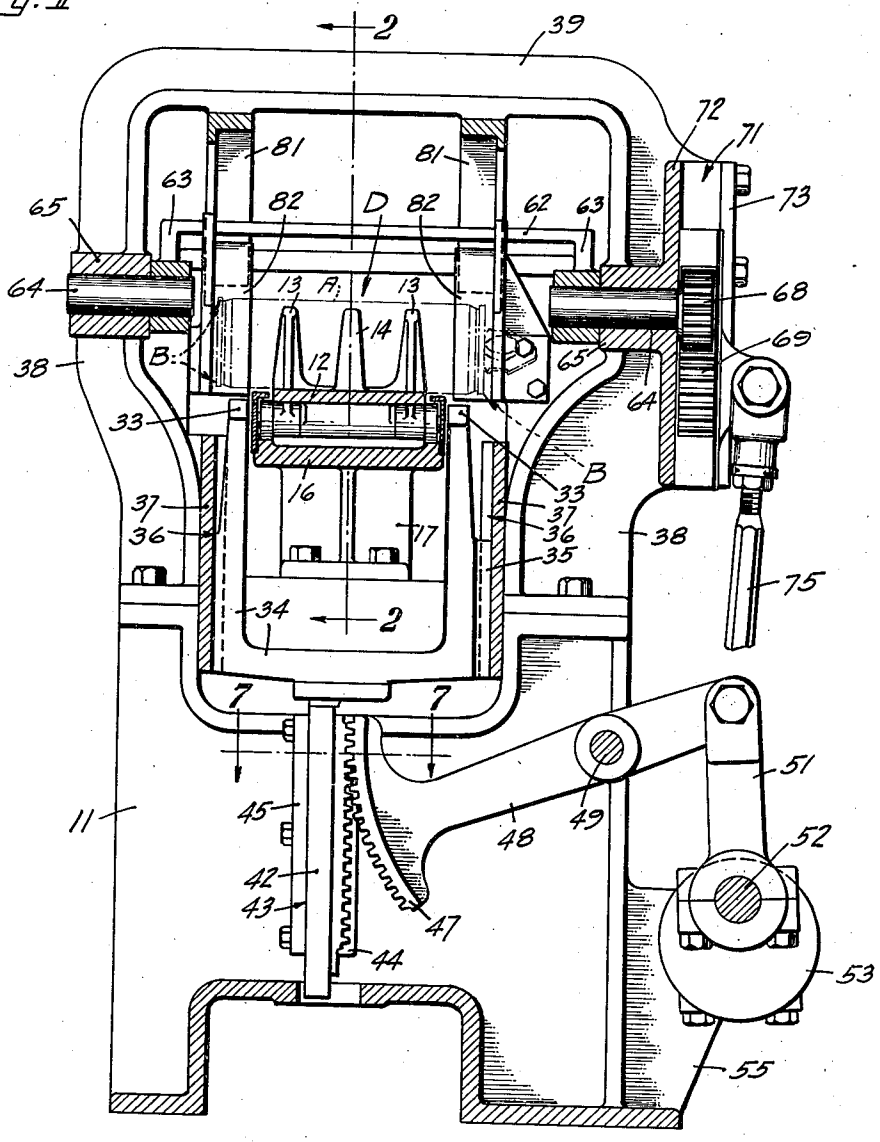
Sept. 23, 1941. H. J. PAYNTER 2,256,490

CAN ORIENTING MECHANISM

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Fig. 1



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Fig. 2

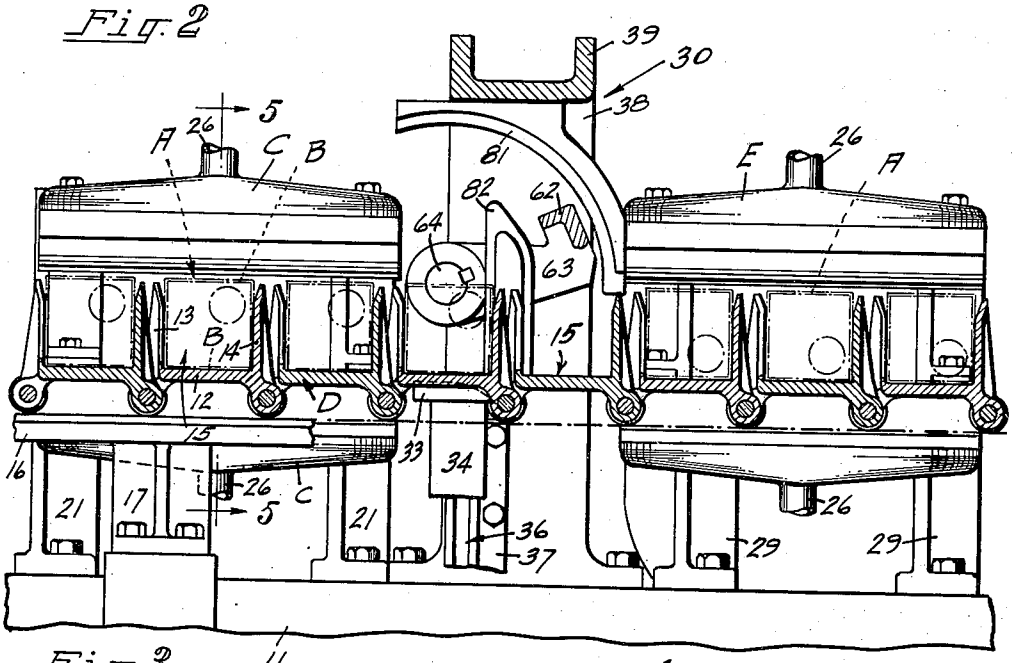


Fig. 3

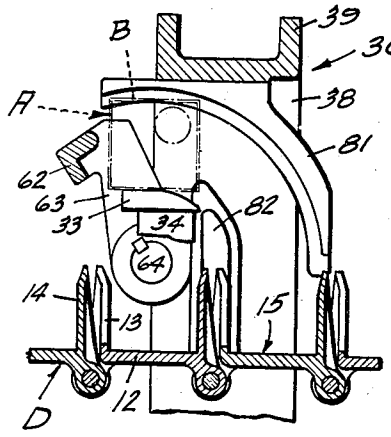
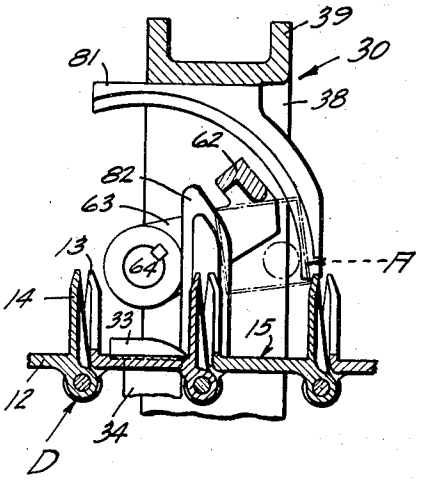


Fig. 4



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CAN ORIENTING MECHANISM

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Fig. 5

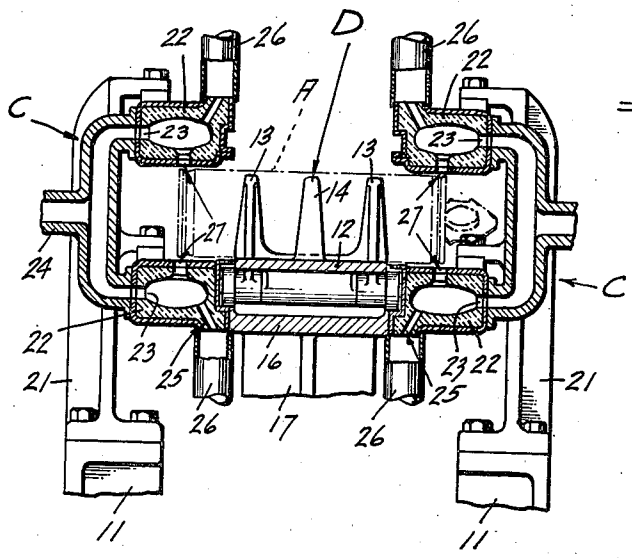


Fig. 6

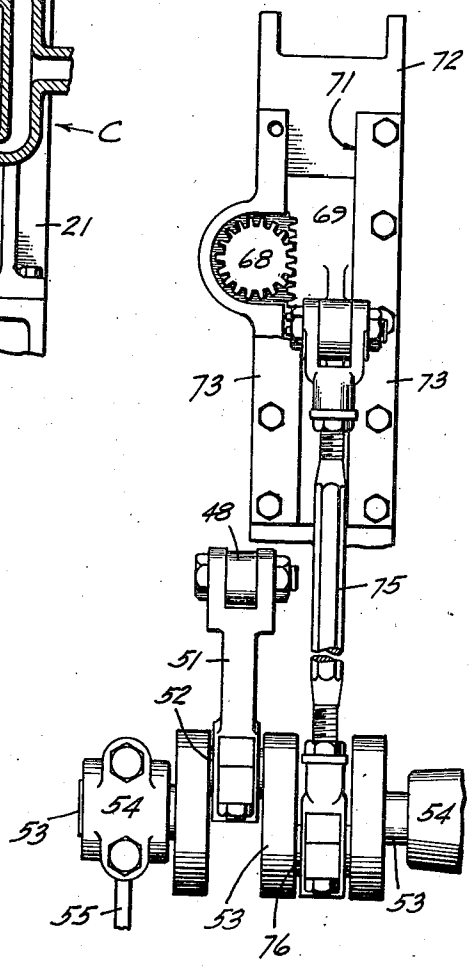
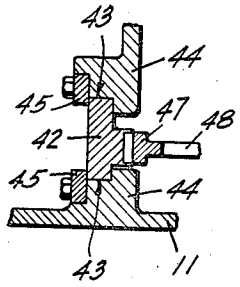


Fig. 7



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Patented Sept. 23, 1941 2,256,490

UNITED STATES PATENT OFFICE

2,256,490

CAN ORIENTING MECHANISM

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Application February 17, 1940, Serial No. 319,527

5 Claims. (Cl. 198—33)

The present invention relates to container or can making machines and has particular reference to turning or partially rotating the can while it is being conveyed along a predetermined path of travel in the machine.

In the manufacture of cans many operations are performed on them while they are moving along a predetermined path of travel on a conveyor or the like. Where the cans are square or rectangular in cross-section it is often desirable to turn or partially rotate them into different positions for different operations while they are moving. However, such turning sometimes presents considerable difficulty where it must be effected over a short distance or in a small space.

The present invention contemplates overcoming this difficulty by providing a turning device which is compact in itself and which is adapted to turn a can through ninety degrees in a small space.

An object therefore of the invention is the provision in a can making machine of a can turning device wherein a can may be rotated through an angle in a short space while traveling through the machine in a continuous procession of such cans without in any way interfering with the progress of the cans.

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 transverse sectional view of a machine embodying the instant invention, with parts broken away;

Fig. 2 is a longitudinal section of the upper portion of the machine as taken substantially along the line 2—2 in Fig. 1;

Figs. 3 and 4 are fragmentary sectional views of parts illustrated in Fig. 2, the views showing the movable parts in different positions;

Fig. 5 is a transverse section of the upper portion of the machine as taken substantially along the line 5—5 in Fig. 2, with parts broken away;

Fig. 6 is a detail in elevation as viewed from the right in Fig. 1, with parts broken away; and

Fig. 7 is a plan sectional detail taken substantially along the line 7—7 in Fig. 1.

As a preferred embodiment of the invention the drawings illustrate a machine for sealing the end seams of square fibre milk containers A of the character disclosed in United States Patent 2,085,979, issued July 6, 1937, to John M. Hothersall. In such a machine opposing end seam edges B at each end of the containers are preferably heated simultaneously and in two stages by radiant heaters C and E while the containers are carried along a straight line path of travel on a conveyor D. Upon the termination of the first heating stage the containers are rotated or turned through ninety degrees and then continue on through the second heating stage. The first heating stage heats two opposed sides of the end seam at both ends of the container and the second heating stage heats the remaining two opposing sides of the seam edges.

This heating of the container is effected prior to a final sealing of the end seams and softens a thermoplastic adhesive in the seams used for securing them together. A machine for performing such a sealing operation is disclosed in United States Patent 2,200,276 issued May 14, 1940, to John M. Hothersall, et al., on Can end assembling machine. However, the sealing operation forms no part of the present invention and therefore it will not be described in this specification, it being here mentioned only in order to give a clear conception of one example of a machine in which the instant invention may be embodied.

In the instant machine the conveyor D is preferably of the endless chain type such as that disclosed in the second mentioned Hothersall patent and is supported on suitable sprockets which are driven in the same intermittent or step-by-step manner as shown in this Hothersall patent, the conveyor and its sprockets being carried in a main frame 11 (Figs. 1 and 2).

The conveyor D preferably comprises a plurality of long connected platform links 12. At one end, each platform is formed with a pair of spaced outwardly projecting fingers 13. At the opposite end of each platform there is only one such finger 14. These fingers and platforms provide spaced pockets 15 along the conveyor in which containers A lying on their side and arranged transversely of the machine are carried through the machine for the performance of the heating operations.

In the space between its sprockets the conveyor D is supported and maintained in a straight line path of travel by a track 16 (Figs. 1 and 5). This track is formed on brackets 17 which are bolted to the main frame 11.

Adjacent the conveyor D are located the first stage radiant heaters C hereinbefore mentioned. These heaters may be substantially the same as those disclosed in United States Patent 2,196,982 issued April 16, 1940, to Herbert F. Cox, Jr., on Can body making machine.

There are preferably two of these heaters C on each side of the conveyor and disposed one adjacent the lower end edge of the passing containers and the other adjacent the top edge of the containers. These heaters are bolted to side brackets 21 (Figs. 2 and 5) which are secured to the main frame 11. Each heater includes a hollow ceramic heating shell 22 having a plurality of inlet openings 23 connected with a gas manifold 24. The gas manifold connects with any suitable source of illuminating gas. Opposite the inlet openings there is provided in the shell an exhaust port 25 which connects with an exhaust pipe 26. Adjacent the container edge there is a slot 27 formed in the shell.

Hence gas admitted by way of the manifold 24 into the ceramic shell 22 when ignited, burns and heats the shell to the desired temperature and this heat is reflected or radiated out of the slot 27 and onto the edges of the passing containers for the purpose hereinbefore explained. The gases of combustion are carried off through the exhaust port 25 and pipe 26.

Adjacent this set of first stage heaters C there is provided a second set of identical construction and operation. These are the second stage heaters E and they are supported on side brackets 29 (Fig. 2).

Between the first stage heaters C and second stage heaters E there is a container turn-over device generally indicated by the numeral 30. It should be noticed that this turn-over device occupies a space between the heaters which is equivalent to only two pockets 15 of the conveyor D and is therefore very compact.

The turn-over device 30 includes a pair of vertically movable lifter pads 33 (Figs. 1, 2, 3 and 4) which are located adjacent the discharge end of the first stage heaters C and one on each side of the conveyor D below the path of travel of the containers thereon. The lifter pads are formed on the upper ends of a U-shaped member 34 having vertically disposed slides 35 which operate in slideways 36 formed in plates 37 secured to inner upright leg sections 38 of an arch frame 39. The arch frame extends over the conveyor D and is bolted to the top of the main frame 11 on each side of the conveyor.

The U-shaped member 34 is secured to the upper end of a rack slide 42 (see also Fig. 7) which operates in vertical slideways 43 formed in web portions 44 of the main frame 11. Gibs 45 bolted to the web portions 44 retain the rack slide in its slideways.

Teeth formed on one side of the rack slide 42 mesh with a segment gear 47 (Figs. 1 and 7) which is formed on the inner end of a lever 48 mounted on a pivot pin 49 carried in the main frame 11. The outer end of the lever is connected to an eccentric arm 51 which is mounted on a crank 52 of a crank shaft 53 journaled in bearings 54 (see also Fig. 6) formed in projecting brackets 55 of the main frame. The crank shaft is continuously rotated in any suitable manner in time with the other moving parts of the machine.

Hence as the crank shaft 53 rotates, it rocks the lever 48 and thus raises and lowers the rack slide 42 and the U-shaped member 34 as well as its lifter pads 33 all in time with the other moving parts of the machine. The up stroke of the lifter pads is effected just after the conveyor D has brought a container out of the range of the first stage heaters C and has come to rest over the top of the lifter pads. As the lifter pads move up they lift the container out of its conveyor pocket 15 and carry it into an elevated position above the conveyor as shown by broken lines in Fig. 3.

In this elevated position at the top of the up-stroke of the lifter pad 33, the container A is adjacent a pusher element or cross-bar 62 which extends across the machine and which is formed on the outer ends of a pair of spaced turn-over arms 63. The arms are mounted on and secured to pivot pins 64 carried in bearings 65 which are formed in the upright leg sections 38 of the arch frame 39.

One of the pivot pins 64 is formed with a pinion 68 (see also Fig. 6) which meshes with a slide rack 69 operating in a vertical slideway 71 in a plate 72 formed on the adjacent pivot pin bearing 65. Gibs 73 bolted to the plate 72 retain the slide rack in place in its slideway. The slide rack is connected by a link 75 to a crank 76 of the crank shaft 53.

Hence the rotation of the crank shaft 53 raises and lowers the slide rack 69 in its slideway 71 and this motion oscillates the pinion 68. When the pinion is rotated in one direction it rocks the turn-over arms 63 (clockwise, Fig. 3) and their connecting cross-bar 62 toward the container on the raised lifter pad. During this rocking motion the cross-bar 62 sweeps the container off the raised lifter pad and propels it downwardly through an arc toward the conveyor D and places it into the conveyor pocket 15 (Fig. 4) just ahead of or in advance of the pocket from which the container was just removed.

During this arcuate path of travel of the container it is guided and directed into position in the proper conveyor pocket 15 by a pair of upper spaced and parallel curved guide rails 81 (Figs. 1 and 2) and a pair of lower spaced and parallel vertical guide rails 82. The upper guide rails are secured to the cross-bar of the arch frame 39 and are located one adjacent each end of the container. The lower guide rails are similarly located but are secured to the upright leg sections 38 of the arch frame.

During the travel of the container A along these guide rails it turns through an angle of ninety degrees and when it comes to rest on the platform 12 of the advance pocket of the conveyor it is resting on its side which is adjacent the side it was resting on in the preceding pocket from which it was removed. Thus it is this arcuate travel that is responsible for the turning of the container. Hence the container in its new pocket and in its new position brings its two unheated edges at each end into proper position for heating by the second stage heaters E.

During the turning action of the container the elevated lifter pads 33 descend to their original position adjacent the conveyor links. The conveyor thereupon advances one step and brings a new container into position over the lifter pads. At the same time the turn-over arms 63 return to their original position at the left of the lifter pads (Fig. 3) and in readiness to turn the new container. The turned container already on the conveyor enters the region of the second stage heaters E and is thus advanced step by step until it is discharged from the machine.

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 with-

out 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.

I claim:

1. A turn-over mechanism for a container making machine, comprising in combination a curved guide rail, a lifter pad for raising a container into an elevated position adjacent said curved guide rail, and a turn-over arm for pushing the elevated container off the lifter pad and along said curved guide rail, said guide rail being adapted to rotate the container relative to its axis for substantially 90 degrees while it travels along the guide rail.

2. A turn-over mechanism for a container making machine, comprising in combination a curved guide rail, a lifter pad for raising a container from a predetermined level into an elevated position adjacent one end of said curved rail, and a turn-over arm for pushing the elevated container off its lifter pad and along said curved guide rail, said guide rail being curved downwardly to the original level of said container for returning it to its original level adjacent to but ahead of said lifter pad while rotating the container through a predetermined angle.

3. In a container making machine, the combination of a conveyor for carrying containers in spaced relation thereon, a curved guide rail above the path of travel of the containers while on the conveyor which curves downwardly toward said conveyor, a lifter pad adjacent said conveyor for picking up a container therefrom and for raising it into an elevated position adjacent said curved guide rail, and a turn-over arm for sweeping the elevated container off its lifter pad and for propelling it downwardly along said curved guide rail and back into position on said conveyor, said guide rail rotating the container through a predetermined angle while it travels therealong so that the container when returned to the conveyor will be in a different position from that it originally had on the conveyor.

4. In a container making machine, the combination of an intermittently actuated conveyor having spaced pockets for carrying square containers on their sides, a curved guide rail above the path of travel of the containers while on the conveyor which curves downwardly toward said conveyor, a lifter pad adjacent said conveyor for lifting a container from its pocket while the conveyor is stationary and for raising it into an elevated position adjacent the upper end of said curved guide rail, and a turn-over arm for sweeping the elevated container off the lifter pad and into and along said curved guide rail, said guide rail rotating the propelled container relative to its longitudinal axis through an angle of ninety degrees and directing the rotated container back onto the stationary conveyor and into a pocket in advance of the one originally occupied by the container.

5. In a container making machine, the combination of a conveyor for carrying square containers on their sides and in spaced relation, a pair of lifter pads arranged one on each side of said conveyor for picking up a container from the conveyor and for raising it into an elevated position above the conveyor, means for actuating said lifter pads in unison, a pair of pivoted turn-over arms for engaging the elevated container adjacent its outer ends and for sweeping it off said lifter pad and for propelling it through an arc down toward said conveyor thereby rotating the container relative to its longitudinal axis so that it will be returned to the conveyor and resting on a different side, devices for actuating said arms in unison, and a pair of curved guide rails adjacent the ends of the container for guiding the container through its arcuate travel toward the conveyor.

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