July 16, 1935. R. E. J. NORDQUIST 2,007,981

CAN FEEDING DEVICE

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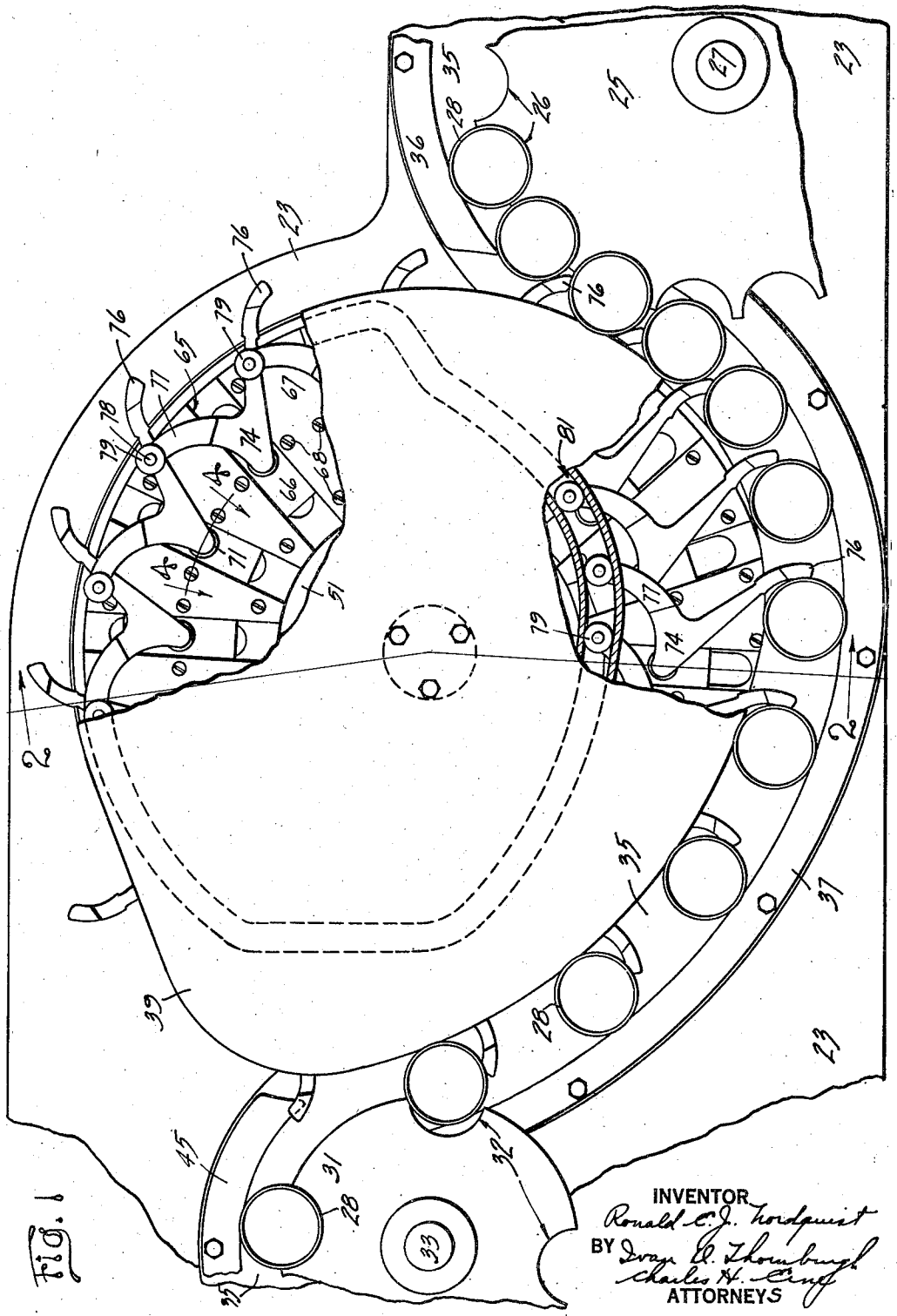


Fig. 1

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Fig. 2

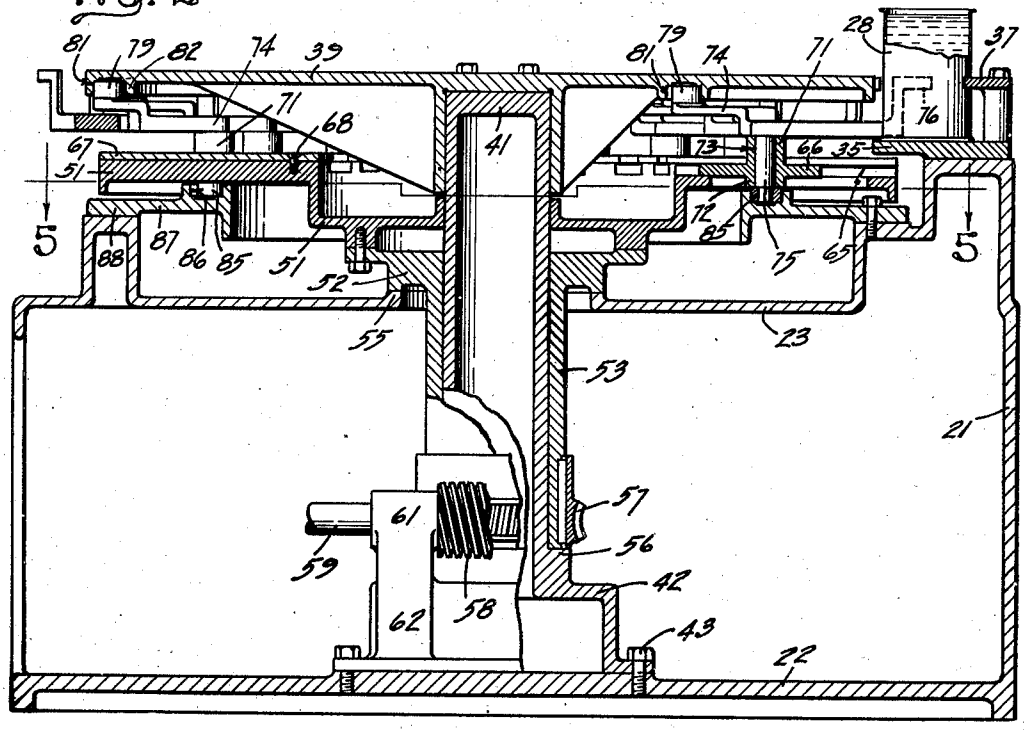


Fig. 3

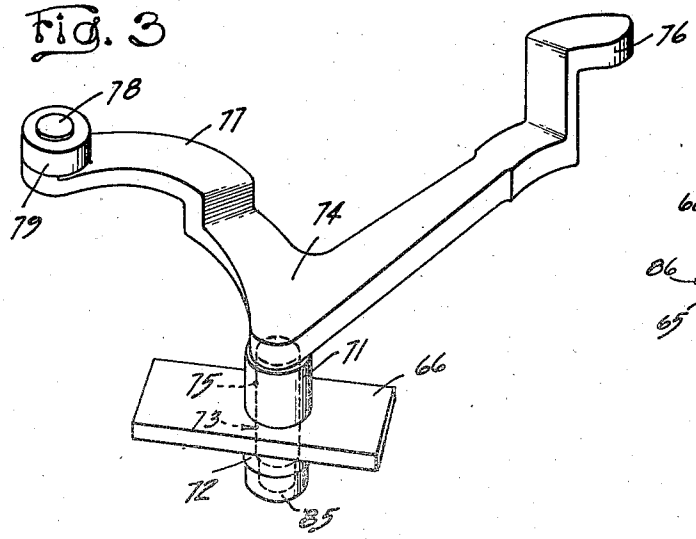
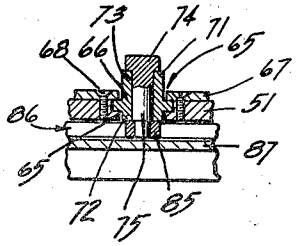


Fig. 4



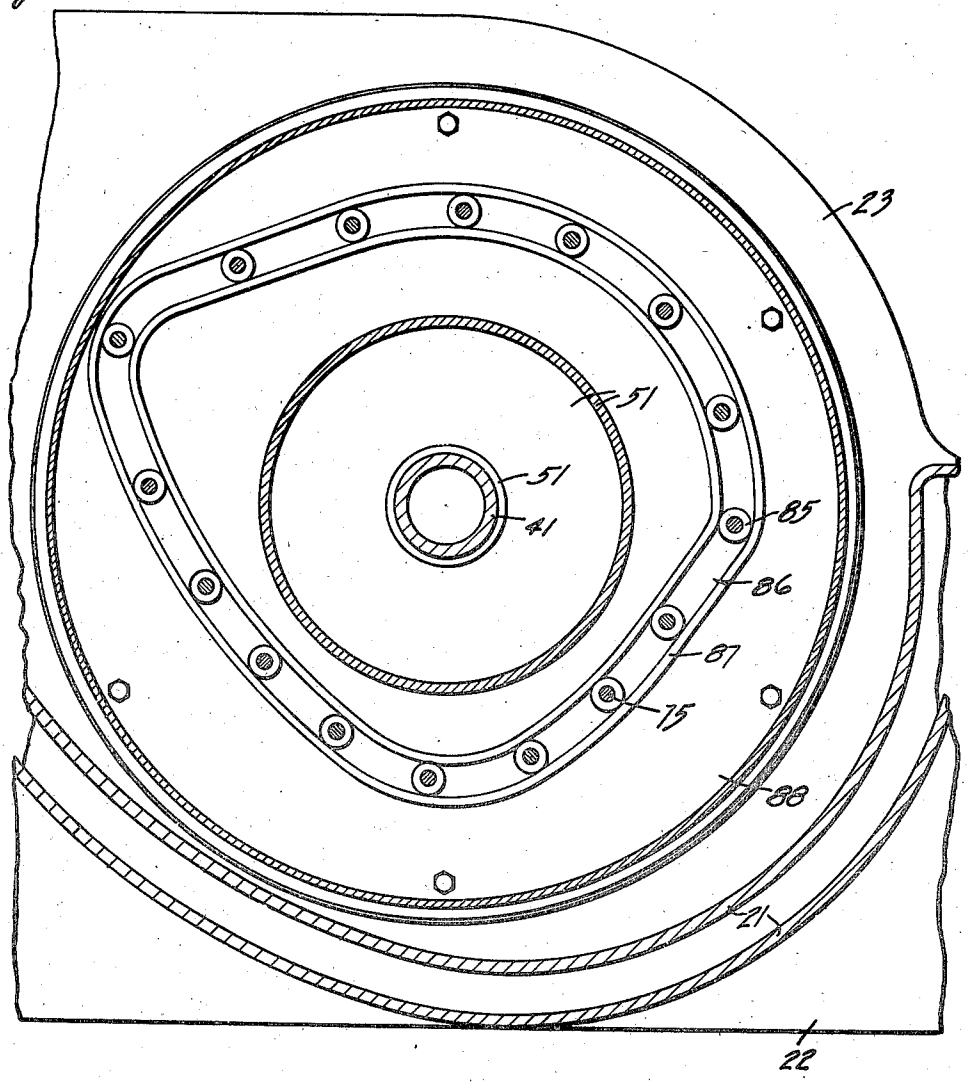
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Fig. 5



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UNITED STATES PATENT OFFICE

2,007,981

CAN FEEDING DEVICE

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Application June 23, 1933, Serial No. 677,327

7 Claims. (Cl. 198—22)

The present invention relates to can feeding devices for accelerating the travel of cans and the like, such as are filled with or have a liquid content so that a greater speed of travel or a greater spacing is obtained between cans without spilling their contents, and the invention has as the principal object the simplification and the more accurate manipulation of such feeding devices.

The invention contemplates the use of three movements or controls for can propelling levers by means of which the levers are bodily carried in a general circular path of travel, are moved in and out and are also rocked back and forth to effect an accurate control of the travel of the cans being propelled by the levers.

The invention has for a further object the provision of simplified can propelling members which engage a can, filled with a liquid or content likely to be spilled, without sudden jar or shaking of the can and which then gently sweep the can over a path of travel while gradually accelerating its movement or increasing the intervals between adjacent cans engaged by adjacent lever devices to the end that the transposition from a relatively slow rate of travel into the higher speed will take place in a smooth, uninterrupted and accurately controlled manner.

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 plan view, partially broken away, of a can feeding device embodying the present invention, this view illustrating the transfer of cans from a turret member having closely spaced pockets into one having pockets spaced considerably further apart, which requires a greater can travel;

Fig. 2 is a transverse sectional view taken substantially along the broken line in Fig. 1;

Fig. 3 is a perspective view of one of the can propelling levers with its associated mounting;

Fig. 4 is a sectional detail taken substantially along the line 4—4 in Fig. 1; and

Fig. 5 is a plan sectional view taken substantially along the broken line 5—5 in Fig. 2.

Movable and stationary parts of the apparatus are carried in a housing 21 (Figs. 2 and 5) which is mounted upon or formed with a base 22. The housing 21 is closed at its upper end by a table section 23.

This table may be a part of other machines which deliver cans into and receive cans from the feeding devices and is here shown as supporting a turret member 25 (Fig. 1) having can receiving pockets 26 which are relatively close together, this turret member being mounted upon and turned by a vertical shaft 27 in any suitable manner. Such turret member illustrates by way of example the delivering of cans 28 to the feeding devices.

The cans 29 coming from the member 25 are closely spaced and the feeding devices herein considered advance these cans 28 while separating them and at the same time accelerate their travel without interrupting or in any way shaking or jolting the cans, such non-spilling feature being particularly desirable where they are substantially filled with liquid or other spillable material.

In Fig. 1 there is also disclosed by way of example a can receiving turret member 31 which is here shown as being supported upon the table 23 at its other end, this turret being formed with can pockets 32 which are spaced a considerable distance between adjacent pockets. This turret member 31 may be mounted upon and rotated by a vertical shaft 33 in any suitable manner.

A track or runway between the members 25, 31 is provided as a path for the cans being conveyed by the feeding devices and in the embodiment disclosed in the drawings this pathway is formed by a horizontal plate 35 (Figs. 1 and 2) which rests upon a raised extension of the table 23. This plate has generally the form of a widely spread letter V and extends from a position beneath the turret pockets 26 of the member 25 to a position beneath the turret pocket 32 of the member 31.

A guide rail 36 is preferably mounted upon the plate 35 adjacent the turret member 25 and its inner edge cooperates with the turret pockets 26 to hold the cans within the turret as the latter rotates with its shaft 27, as illustrated on the right hand side of Fig. 1. A curved guide rail 37 is also carried by the plate 35 and its inner edge cooperates with the peripheral edge of a stationary member 39 which is a part of the can feeding device proper.

As best illustrated in Fig. 2 this plate 39 is mounted upon the upper end of a central post 41 which is formed with a base 42 mounted upon the frame base 22 and secured in fixed position by bolts 43. The periphery of the plate 39 along one side and the spaced inner edge of the guide rail 37 is of such shape as to direct the cans 28 from the turret member 25 in a path of travel

best adapted to prevent spilling of any liquid contents. At the exit end of the guide rail 37 which is adjacent the turret member 31 a third guide rail 45 is bolted upon the plate 35 and this cooperates with the member 31 to hold the cans 28 within its pockets 32 after the feeding devices have delivered these cans at the greater rate of travel and at the greater spacing.

The feeding devices proper are carried in a spider 51 (Figs. 1 and 2) which surrounds the post 41 and revolves about it. This spider is bolted to the circular head 52 of a sleeve 53 which is rotatably mounted on the stationary post. The spider 51 and parts carried thereby are supported upon the table 23 and upon the stationary post, the head 52 bearing upon a circular boss 55 formed in and projecting upwardly from the table and the lower end of the sleeve 53 resting upon a shoulder 56 formed in the base 42 of the post.

The spider 51 is continually rotated during the operation of the apparatus and for this purpose the lower end of the sleeve 53 is provided with a ring worm gear 57 which is keyed to the sleeve and which meshes with and receives rotation from a worm 58 secured to a drive shaft 59. The drive shaft 59 is journaled in any suitable manner as in a bearing 61 formed in a bracket 62 projecting upwardly and formed as an integral part of the base 42 of the stationary post and may also be journaled in other bearings not shown. This drive shaft 59 may be rotated in any suitable manner to effect rotation of the sleeve 53 and the spider 51.

The spider 51 is formed with a plurality of radial slots 65 (Figs. 1, 2 and 4) and slide blocks 66 are carried in these slots. Top protecting plates 67 are mounted upon the upper surface of the spider 51 and are secured in fixed position by screws 68 so that their side edges extend over the edges of the slots in the spider. This prevents vertical displacement of the slide blocks 66 within the spider and allows for unrestricted radial movement.

Each slide block 66 (Figs. 2, 3 and 4) is formed with an upper boss 71 and a lower boss 72 which are in direct alignment with one another and a vertical bore 73 passes entirely through the upper and lower bosses of the slide block. A can propelling lever 74, illustrated as an angle lever, is carried in each block 66, being formed with a depending stem 75 which is loosely positioned in the bore 73. The weight of the lever is supported on the top of the upper boss 71. Each lever 74 is formed with two arms, one having an upwardly extending can engaging finger 76, the other being a cam roller arm 77.

The arm 77 carries a pin 78 on which cam roller 79 is rotatably mounted. A cam grove 81 (Figs. 1 and 2) is formed in a depending cam ridge 82 projecting downwardly from the under surface of the plate 39 and the roller 79 of each lever 74 operates within the cam groove as the spider 51 carries it and its slide block 66 around with it.

The stem 75 of the lever 74 projects below the lower end of the boss 72 where it carries a cam roller 85 (Figs. 2, 4 and 5). As the slide blocks 66 are carried around by the spider 51, as previously described, each cam roller 85 traverses a cam groove 86 formed in a cam ring 87. This cam ring is formed with a circular flange 88 that rests upon and is bolted to the table 23.

By means of the spider and cam controls of the levers 74 their can engaging fingers 76 are brought into engagement with and behind the cans 28 while they are still within the turret pockets 26 of the member 25 and as the spider 51 continues its rotation the cam 87 working through the rollers 85 on the pivotal centers of the levers, slide the blocks 66 of the levers within their radial slots 65. At the same time the cam groove 81 operating upon the cam rollers 79 of the levers 74 holds or oscillates them on their pivotal mountings, as the case may be, to cooperate with the slide block position so that the fingers 76 remain against the walls of the cans until the latter are delivered with the resulting accelerated speed of travel into the pockets 32 of the turret member 31.

This combination of controls of the pivotal part of the lever and the rocking of the lever effects the desired movement of the engaging fingers 76 of the levers so that as soon as a turret pocket 26 releases a can 28 the engaged lever finger 76 picks up and gradually accelerates it as it moves between the guide rail 37 and the peripheral edge of the plate 39. This advance movement is of such a nature as to uniformly increase the speed of travel of the can without permitting any spilling of the liquid contents and this increasing acceleration also spaces adjacent cans further apart so that they are brought into proper spaced position and properly delivered within the pockets 32 of the turret member 31 without any spill of the can contents.

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.

I claim:

1. In a can feeding and can accelerating device, the combination of a rotatable spider, slide blocks carried by said spider and having radial movement therein, can propelling levers carried by said slide blocks and having pivotal movement thereon, and fixed cam means for rocking said levers on their pivots during the rotation of said spider to advance the cans propelled thereby at an accelerated speed of travel.

2. In a can feeding and can accelerating device, the combination of a rotatable spider, slide blocks carried by said spider and having radial movement therein, can propelling levers carried by said slide blocks and having pivotal movement thereon, and fixed cam means for moving said slide blocks away from the center of said spider during its rotation to advance the cans propelled by said levers at an accelerated speed of travel, and means for swinging said levers on their pivots to still further accelerate the speed of travel of the cans.

3. In a can feeding and can accelerating device, the combination of a rotatable spider, slide blocks carried by said spider and having radial movement therein, can propelling levers carried by said slide blocks and having pivotal movement thereon, cam means for moving said slide blocks radially of said spider while the latter is rotating, and other cam means for rocking said levers on their pivots during the rotation of said spider, said slide block and lever actuating means cooperating to advance the cans propelled by said levers at an accelerated speed of travel.

4. In a can feeding device, the combination

of a rotatable spider, slide blocks carried by said spider and having independent movement relative to the said spider rotation, levers pivotally mounted on said slide blocks and having can engaging and propelling arms, and cam means for shifting said slide blocks and other cam means for rocking said levers to carry said can propelling arms in a continuous path of travel to uniformly accelerate the cans engaged thereby.

5. In a can feeding device for delivering cans from a member having close spaced pockets to a second member having wider spaced can pockets, the combination of a rotatable spider having radial slots, slide blocks carried by said spider and located in said radial slots, a can propelling lever pivotally carried on each slide block, cam means for moving said slide blocks within said slots, and other cam means for rocking said levers on their pivots, said cam means acting together to separate adjacent cans for proper spacing into the wider spaced can pockets of said second member.

6. In a can feeding device, the combination of a rotatable spider, slide blocks carried by said spider and having independent radial movement therewith, levers pivotally mounted on said slide blocks and having can engaging and propelling arms and cam roller arms, cam rollers carried on the pivotal centers of said levers, other cam rollers carried on said cam roller arms, and stationary actuating cams located below and above said spider for respectively engaging said pivotal cam rollers and said lever arm cam rollers for shifting said slide blocks and rocking said levers to carry said can propelling arms in a continuous path of travel to uniformly accelerate the cans engaged thereby.

7. The combination of a can delivering turret, a can receiving turret, means or guiding the cans from the delivering to the receiving turret along a suitable path, and means for accelerating the movement of the cans in said path, comprising swinging angle levers having fulcrums and arms to engage said cans and laterally extending roller arms, means for moving the fulcrums of said levers bodily radially relative to said path, rollers on said roller arms, and a fixed cam having means to control said rollers, which means is partly eccentric relative to said path.

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