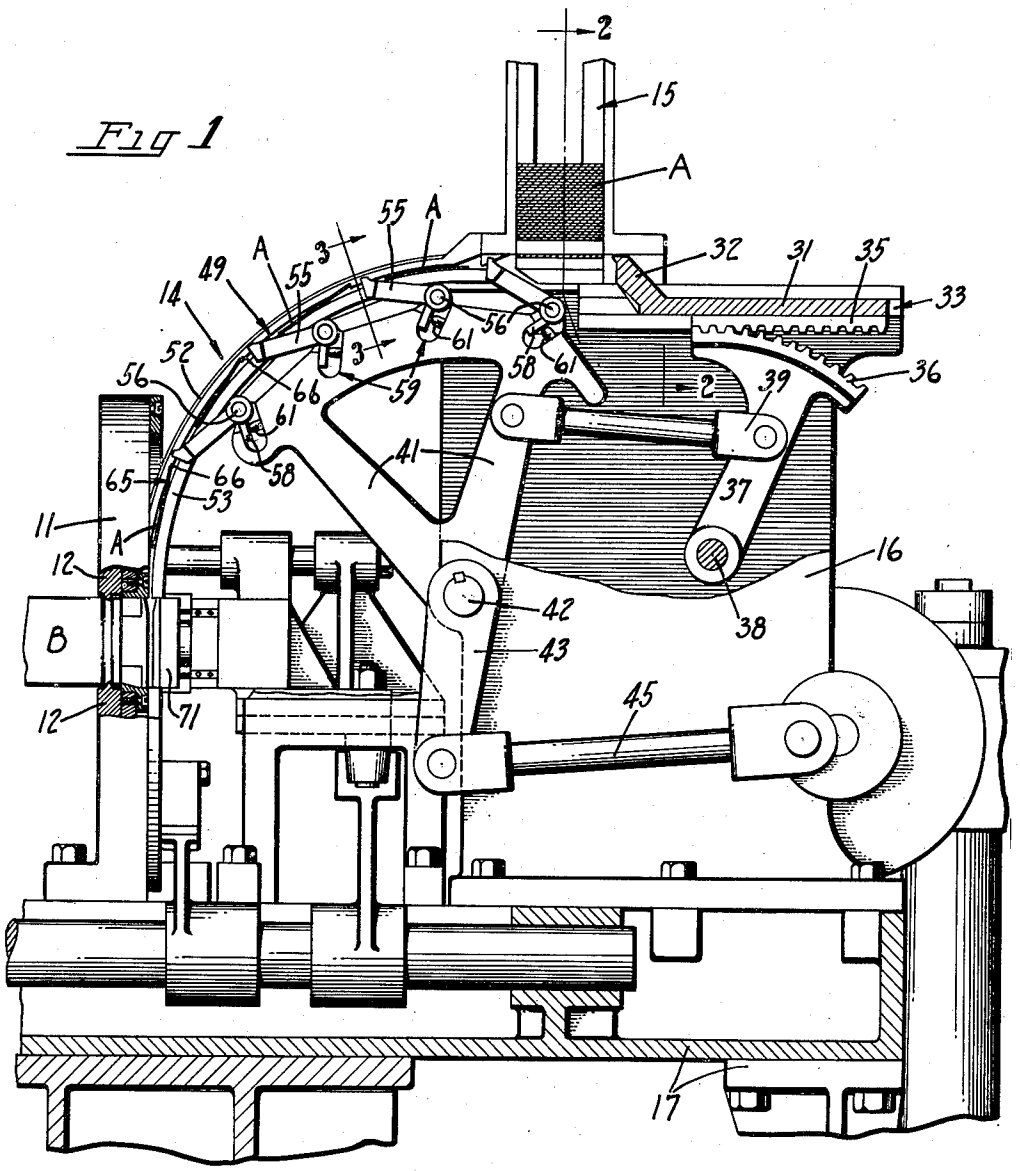
Dec. 9, 1941. J. F. PETERS 2,265,191

FEEDING DEVICE

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Fig 1



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Fig 2

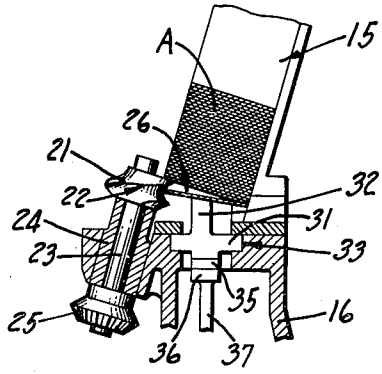


Fig 3

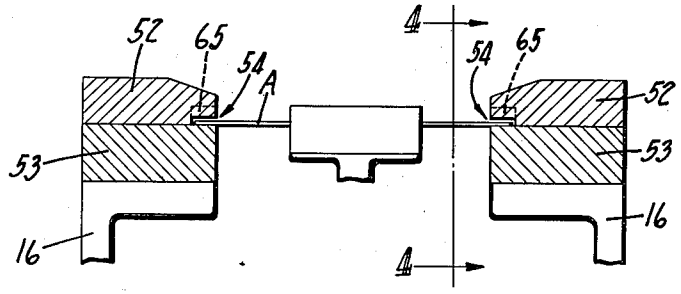
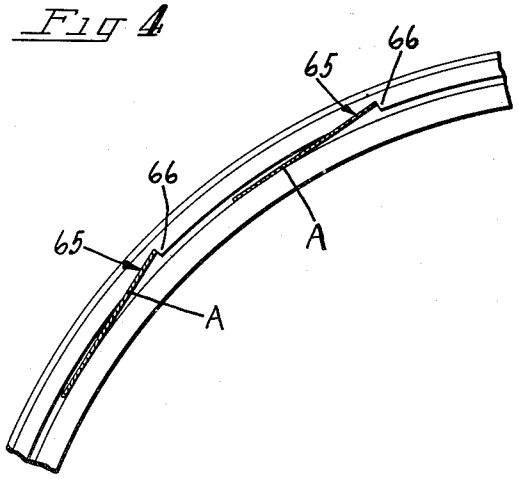


Fig 4



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UNITED STATES PATENT OFFICE

2,265,191

FEEDING DEVICE

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4 Claims. (Cl. 271—10)

The present invention relates to feeding devices of the reciprocating character for advancing can parts along a predetermined path of travel and has particular reference to retaining the fed can parts in an advanced position so that they will be prevented from slipping back along their line of travel with the feed elements. This is an improvement on the Can end assembling machine disclosed in United States Patent 2,200,276, issued May 14, 1940, to J. M. Hothersall et al.

In feeding devices of the reciprocating character the articles to be fed along a path of travel are usually engaged by spring held feed dogs carried in a reciprocating feed bar or the like. On the return stroke of the feed bar the dog is pressed down by the article following the one just advanced and travels therealong to its original position behind the article so that it will be in readiness to engage and advance this article on the next feed stroke. Numerous devices have been designed to prevent retrograde movement of the article with the feed finger as it returns to its rearmost position but it appears that such devices are sometimes of complicated and expensive construction.

The instant invention contemplates the provision of a feeding device having a rear movement stop which is simple and inexpensive in construction and which may be readily attached to most any feeding device.

An object therefore of the invention is the provision of a can part feeding device of a reciprocating character having a rear movement stop wherein can parts fed along a predetermined path of travel are prevented from returning with the feed elements on their rearward stroke.

Another object is the provision of such a feeding device wherein the guide rails adjacent the path of travel of the can parts are formed with spaced notches which engage behind an advanced article and thereby hold it against return with the feed elements on their rearward stroke.

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 vertical sectional view of a feeding device embodying the instant invention, with parts broken away;

Fig. 2 is a vertical sectional view taken substantially along the line 2—2 in Fig. 1, with parts broken away;

Fig. 3 is an enlarged transverse section taken substantially along the line 3—3 in Fig. 1, with parts broken away; and

Fig. 4 is a vertical longitudinal section taken substantially along the line 4—4 in Fig. 3.

As a preferred embodiment of the invention the drawings illustrate principal parts of a fibre can end feeding and assembling station of a machine of the character disclosed in the above mentioned Hothersall patent.

In such a machine the can end members indicated by the numeral A are fed along a curved path of travel into position adjacent the open end of rectangular fibre can bodies B and are inserted within the bodies and subsequently sealed in place to produce the well known milk containers of the character disclosed in United States Patent 2,085,979, issued July 6, 1937, to J. M. Hothersall.

The can bodies B are carried through the machine in a horizontal position on a suitable intermittently moving conveyor which brings the bodies to rest at successive working stations located along the conveyor. When a body comes to rest at the assembly station shown in Fig. 1 it is shifted endwise, transversely of the conveyor, into a can holding head 11. This head is provided with radially movable jaws 12 which move inwardly and around the inserted end of the body and temporarily hold it against displacement for the reception of a can end member A.

The can end member A adapted to be inserted within the open held end of the body B is brought into position adjacent the end of the body by a feeding device generally indicated by the numeral 14. This device includes an inclined magazine 15 which retains a stack of the end members A. The magazine is supported on a subframe 16 which is bolted to a machine main frame 17.

The end members A are fed from the bottom of the magazine, the lowermost member in the stack first being separated from the stack and then completely ejected from the magazine. Separation of the lowermost end member is preferably brought about by a continuously rotating separator screw 21 (Fig. 2) having a long lead thread 22 which supports one edge of the stack of the end members in the magazine. The screw is mounted on the upper end of an inclined shaft 23 carried in a bearing bracket 24 secured to

the sub-frame 16. The lower end of the shaft carries a bevel gear 25 which may be rotated in any suitable manner in time with the other moving parts of the machine.

Hence as the shaft 23 rotates, the separator screw thread 22 works its way in between the lowermost end member A and the one next above in the stack. Rotation of the screw thus brings the lowermost end member into a horizontal position as shown in Fig. 2 as the edge of the end member travels downwardly with the screw thread. The remaining end members in the stack are in supported position on top of the screw and hence a space 26 is created between the lowermost end member and the one next above in the stack.

Ejection of this separated end member A from the magazine is effected by a reciprocating horizontal slide bar 31 formed with a stationary feed dog 32 which travels back and forth under the magazine 15. The slide bar operates in a slideway 33 formed in the sub-frame 16. A rack 35 on the bottom of the slide bar meshes with a segment gear 36 formed on an arm 37 mounted on a pivot pin 38 carried in the sub-frame.

The arm 37 is connected by a link 39 to a rocker frame 41 which is keyed to a shaft 42 carried in the sub-frame 16. A lever 43 also keyed to the shaft 42 is connected to an operating link 45. This link is reciprocated in any suitable manner in time with the other moving parts of the machine and preferably in the manner disclosed in the Hothersall patent above mentioned.

Reciprocation of the link 45 rocks the rocker frame 41 and this through the connecting link 39 rocks the arm 37 and the segment gear 36. Rocking of the gear thus reciprocates the slide bar 31 in its slideway 33. When the slide moves inwardly its feed dog 32 engages the separated can end A and pushes it out from under the magazine. The moving can end rides along an inclined sloping surface 48 on the bottom of the magazine and is thus directed into a curved runway 49 disposed adjacent the outer edge of the rocker frame 41.

The curved runway 49 extends inwardly and downwardly toward the can holding head 11 and terminates adjacent the open end of the held can body B. This guideway includes a pair of spaced and parallel outer flat rails 52 which are secured at one end to the sub-frame 16 and a pair of similar inner flat rails 53 which are secured to the outer rails. The outer rails 52 are formed with an undercut recess 54 in which the can ends slide and which confines them against lateral displacement.

A can end deposited in the runway 49 is advanced therealong in a step-by-step manner. For this purpose the rocker frame 41 is formed with a curved outer face which carries a plurality of spaced feed fingers 55 mounted on pivot pins 56 secured in the frame. The outer ends of the feed fingers extend into the path of travel of the can ends in the runway. Adjacent the pivot pins 56 the fingers carry depending lugs 58 which extend down into clearance recesses 59 formed in the rocker frame. Each of these lugs is engaged by a spring barrel 61 backed up by a compression spring housed in the rocker frame. The spring barrels thus normally maintain the feed fingers in position in the runway, the lugs 58 engaging against the rocker frame adjacent one side of the recess and thereby serving as stops to limit the outer travel of the feed fingers.

Hence the rocker frame 41 carries the feed fingers 55 back and forth along the runway 49 for a stroke slightly greater than the length of one can end. On the forward stroke a feed finger engages behind a can end and pushes it along the runway one step. On the backward stroke the can end remains stationary in its advanced position and the finger is thus depressed by the can end next in line and travels back along this can end. At the completion of the return stroke the finger snaps up behind the can end and is thus ready for the next forward stroke. This is a usual feed device construction.

In order to hold the advanced can ends from retrograde movement on the return stroke of the fingers, the outer rails 52 of the runway 49 are formed with a plurality of spaced notches 65 which set off stop shoulders 66 in the rails. These notches are located just above the undercut clearance recesses 54 in the rails.

The can ends while traveling along the runway 49 are closely confined between the inner and outer rails 53, 52 and thus assume a curved character which corresponds to the curvature of the runway. When an advanced can end comes to rest at the end of the feeding stroke its rear edge is adjacent a pair of the notches 65. Hence the natural spring in the fibre stock of which the can ends are made permits the can end to return to its flat straight condition and this snaps its rear edge outwardly into a notch where it is adjacent the stop shoulders 66. Thus when the feed fingers move rearwardly the can ends are held against displacement by the stop shoulders and are thus prevented from moving back with the fingers.

The last stepped advancement of a can end A brings it into a vertical position, on edge and in front of the held can body B in the holding head 11. The can end is thereupon pushed into place within the body by a reciprocating pusher element 71 which is disposed rearwardly of the can holding head and in endwise alignment with the held can. This pusher element may be reciprocated in any suitable manner operating in time with the other moving parts of the machine.

Insertion of the can end into the body and a partial folding inwardly of the body flange to hold the end in place completes the assembling operations at this station and the can is thereupon released and withdrawn from the can holding head 11 and advanced by the conveyor to other stations for subsequent operations.

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. A can end feeding device, comprising in combination, a plurality of spaced feed fingers adapted to be reciprocated in unison for advancing can ends along a predetermined path of travel in a step-by-step motion, and a curved runway disposed adjacent the path of travel of said fingers for guiding the can ends, said runway having a plurality of spaced notches setting off stop shoulders into which the rear edges of the can ends flex and engage, thereby preventing retrograde movement of the can ends with the

fingers when the latter move back on their return stroke.

2. A can end feeding device, comprising in combination, a rocker frame having a curved outer face, means for rocking said frame through a forward stroke and through a return stroke, a feed finger mounted in said rocker frame for advancing can ends along a curved path of travel in a step-by-step motion, and a curved runway disposed adjacent the outer face of said rocker frame for guiding a can end while holding it in curved shape corresponding to the shape of said curved runway, said runway having a notch which allows said can end to assume its original flat form and to engage a stop shoulder set off in said notch to prevent retrograde movement of the can end with the said feed finger when the latter moves rearwardly on its return stroke.

3. A can end feeding device, comprising in combination, a rocker frame having a curved outer face, means for rocking said frame through a forward stroke and through a return stroke, a plurality of spaced feed fingers mounted in said rocker frame for advancing can ends along a curved path of travel in a step-by-step motion, and a curved runway including a pair of spaced and parallel inner bars and a similar pair of outer bars superimposed on said inner bars disposed adjacent the outer face of said rocker frame, said outer bars having undercut recesses for confining and guiding the can ends and having a plurality of spaced notches setting off stop shoulders against which an edge of a can end engages and thereby prevent retrograde movement of the can ends with the fingers when the latter move rearwardly on their return stroke.

4. A can end feeding device, comprising in combination, a magazine for retaining a stack of can ends, a separator screw adjacent said magazine for separating the lowermost can end from the others in the magazine, a feed dog also adjacent said magazine for ejecting said separated can end from the magazine, a plurality of spaced feed fingers adapted to be reciprocated in unison and in time with said feed dog for picking up the ejected can ends and for advancing them along a predetermined path of travel in a step-by-step motion, and a curved runway disposed adjacent the path of travel of said fingers for guiding the can ends, said runway having a plurality of spaced notches setting off stop shoulders into which the rear edges of the can ends flex and engage, thereby preventing retrograde movement of the can ends with the fingers when the latter move back on their return stroke.

JOHN F. PETERS.