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CAN FEEDING APPARATUS

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Fig. 1

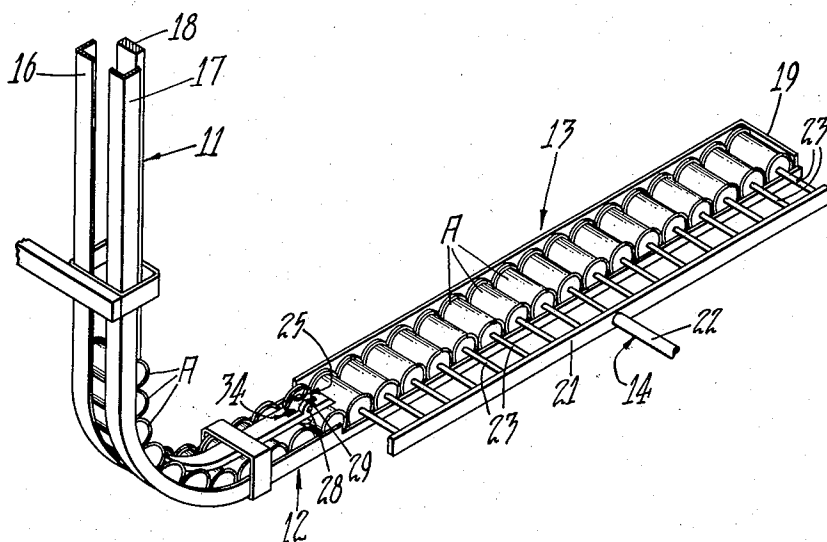
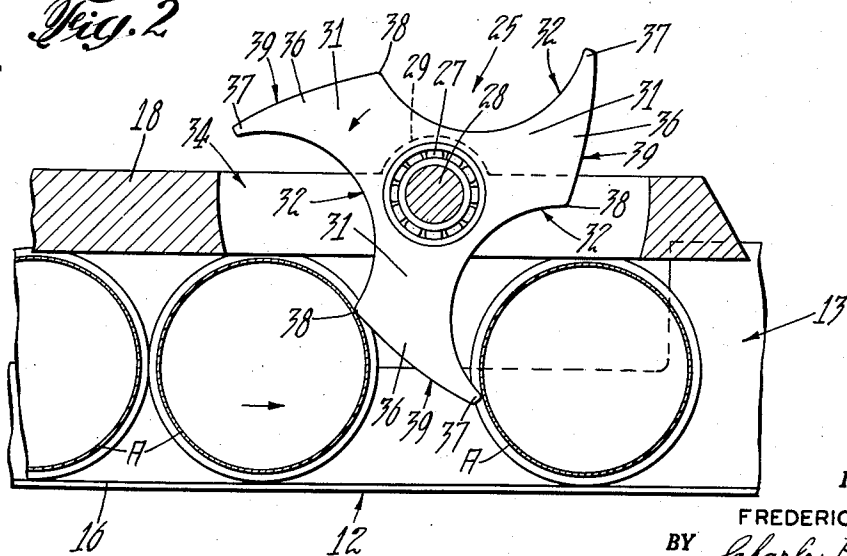


Fig. 2



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CAN FEEDING APPARATUS

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3 Claims. (Cl. 193—32)

The present invention relates to can or container feeding apparatus and has particular reference to devices for controlling the flow of cans or containers along runways in which the cans build up an excessive pressure against each other.

In the canning industry, cans or containers during manufacture and in handling after manufacture frequently are fed along runways and troughs from one station or machine to another. Where long lines of cans or stacked cans moving from vertical runways are involved, back pressure often develops which causes the cans in connecting horizontal runways to climb up on each other and create jams or cause otherwise undesirable feeding conditions. Particularly is this the case where cans are fed into loading troughs from which they are removed manually by forks for loading into shipping bags or cartons, or box cars and trucks.

An object of the instant invention is the provision of a runway device which is operable by the cans passing through a runway and which reduces the back pressure on the cans advanced beyond the device to prevent these latter cans from becoming jammed together under undesirable excessive pressure, or in such a manner as to cause them to climb up on one another.

Another object is the provision of such a runway device which accelerates the advancement of each can as it passes the device so as to space them apart to facilitate further advancement.

Another object is to facilitate advancement and/or collection of cans in open troughs of runways in which jamming of the cans would cause them to spill out of the runway.

Another object is to facilitate the advancement of cans rolling on their sides without excessive back pressure against the cans.

Another object is to control the flow of cans through the runway without excessive back pressure, by a simple device which is inexpensive to build and which operates efficiently with a minimum of maintenance.

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 perspective view of a can runway embodying a can control device of the instant invention; and

Fig. 2 is an enlarged sectional view taken through the can control device in the runway showing how the back pressure on the cans is relieved.

As a preferred or exemplary embodiment of the instant invention the drawing discloses cylindrical sheet metal cans A, having one end open, rolling on their sides from a vertically disposed chute 11 into a connecting runway 12 terminating in an open trough 13 from which rows of a plurality of cans in straight line formation are lifted by a manually operated conven-

tional stacking fork 14 for transferring the cans into shipping carriers, cartons, box cars, trucks or the like shipping media.

The chute 11 and runway 12 preferably consist of a pair of spaced and parallel angle irons 16, 17 which guide and support the rolling cans A and an oppositely disposed flat bar 18 extending parallel with the angle irons to hold the cans against displacement from the angle irons, the bar 18 and the angle irons 16, 17 being tied together at spaced intervals to produce a unitary structure. The open trough 13 preferably is a continuation of the angle irons 16, 17 with the bar 18 omitted to provide an open top so that the line of cans A in the trough can be readily lifted out. A stop member 19 at the far end of the trough serves as a stop to arrest the advancement of the cans to produce a stationary row of cans in the trough. The fork 14 preferably is a crossbar 21 having a handle 22 projecting from the center of one side and from the opposite side a plurality of parallel prongs or tines 23 spaced apart sufficiently to enter into the cans through their open ends for removing the cans from the trough.

The cans A are fed into the vertical runway or chute 11 in any suitable manner from any suitable source of supply, such as the machines which produce them or from storage, which source may be and usually is at a higher elevation, such as a ceiling runway or from another floor of the plant. From this higher elevation, the chute 11 guides the cans A, in a substantially continuous line or procession in contiguous relation, into the horizontal runway 12 along which they roll on their sides into the trough 13 under pressure of the cans in the chute 11, to produce a straight line row in the trough 13 for removal by the fork 14.

In order to relieve the pressure of the cans in the vertical chute 11 and runway 12 against the cans in the trough 13 so as to prevent the cans in the trough from jamming so tightly together that they climb up onto one another and spill out of the trough, a back pressure relieving element 25 is interposed in the path of travel of the cans as they enter the trough. This back pressure relieving element 25 preferably is a star wheel which is freely and sensitively mounted for rotation in the direction of travel of the cans on a ball bearing 27 carried on a cross-shaft 28 disposed in bearings 29 formed in the runway bar 18. The star wheel 25 preferably is formed with three prongs 31 which set off can pockets 32 between them. The prongs 31 rotate through a slot 34 formed in the runway bar 18 and travel down into and through the runway adjacent the entrance to the trough 13 as shown in Fig. 2.

As the cans A pass through the runway 12, beneath the star wheel 25 as shown in Fig. 2 each can engages against a prong 31 so that the prong enters between adjacent cans to freely rotate the star wheel as the cans pass along into the trough 13. When the trough 13 is filled with a row of contiguous cans as shown in Fig. 1, the flow of cans in the runway 12 stops and hence the star wheel stops. The length of the trough is proportioned for the size of the cans to make the star wheel stop with a prong 31 in place between two adjacent cans substantially as shown in Fig. 2.

The outer or free ends of the prongs 31 are formed with a foot 36 having at its leading edge a comparatively pointed toe or toe section 37 and at its trailing edge a blunt heel or heel section 38 connected to the toe 37 in a slightly convex face 39. The radial distance of the toe 37 from the center of the star wheel 25 is considerably greater than the radial distance of the heel 38 from the center of the star wheel.

Hence as a result of this difference of the radial distances between the wheel center and the toe and the

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wheel center and the heel of a prong 31 interposed between adjacent cans A advancing through the runway 12 under pressure of the cans in the vertical chute 11 as shown in Fig. 1, the force or pressure of the cans in the chute against the heel 38 is so distributed from that point that only a fraction of the applied pressure is transmitted to the toe 37, thereby reducing the pressure on the cans in the trough, with the result that the cans in the trough are comparatively free from pressure against each other and are prevented from jamming against and climbing up on each other. This results in a line of cans in the trough which is in orderly arrangement and which can be readily lifted out by the fork 14 for packing.

This particular relation of the toe 37 and heel 38 of the prongs 31 also provides for a slight acceleration of the cans entering the trough, as they leave the star wheel and this acceleration spaces the cans so that they roll freely out of contact with each other as they enter the trough. When the advancement of the cans in the trough is arrested by the stop 19 and the line or row is formed, the cans of course are in contiguous relation with a negligible pressure between them as mentioned above.

Where the runway 12 is of considerable length it has been found advantageous to provide a plurality of the star wheels 25 spaced at intervals along the runway to reduce the pressure on the cans in the runway between star wheels.

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. An apparatus for feeding cans, comprising in combination a runway for guiding cans along a predetermined path of travel, a rotatable element mounted for free rotation adjacent said runway, said element having radial

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prongs movable into and out of said path of travel of said cans and engageable by said cans to rotate said element and thus insert said prongs successively between adjacent cans moving through said runway, each of said prongs having a foot for spreading said adjacent cans apart, said foot having a toe section engageable against one of said adjacent cans and a heel section engageable against the other of said adjacent cans, said toe section being spaced a greater distance than said heel section from the center of rotation of said rotatable element to transmit the pressure exerted by said cans against one of said sections as a modified pressure to the cans engageable with the other of said sections to control the pressure on the cans moving past said element.

2. The combination defined in claim 1 wherein there is provided a trough disposed in endwise alignment with said runway for receiving a line of cans from said runway and a stop in said trough to hold said line of cans stationary, and wherein said rotatable element is disposed at the entrance of said trough with a said prong insertable between adjacent cans at said entrance to transmit the pressure of the cans applied to said heel section of said prong at a lesser degree against the cans adjacent said toe section to relieve the pressure on the cans in said trough to facilitate maintenance of said cans in an orderly row in said trough.

3. The combination defined in claim 2 wherein the distance between said stop and said rotatable element is proportioned for the size of said cans so that when said trough between said stop and rotatable element is filled with cans said rotatable element stops with one of its prongs directed transversely of said trough and inserted between adjacent cans whereby a minimum pressure is transmitted through said rotatable element from the cans in said runway to the cans in said trough.

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