Our invention relates to filling machines, and particularly to feed wheels therefor.

One object of our invention is to provide a feed wheel for a filling machine that shall have an adjustable tensioning device for insuring steady movement thereof.

Another object of our invention is to provide a feed wheel for a filling machine that shall have frictional mechanism for eliminating irregularities in its movement.

Another object of our invention is to provide a guide rail for a feed wheel that shall have a plurality of relatively short tensioning devices for controlling its movement.

A further object of our invention is to provide a feed wheel that shall have a plurality of relatively short springs for engaging objects being transported by the feed wheel in order that uniform pressure may be applied thereto.

In feed wheel devices that may be particularly adapted for use in connection with filling machines it is desirable that uniform movement be had in order that spilling and slopping of the contents of containers being conveyed thereby may be eliminated. In order to provide such uniform movement, we interpose a brake mechanism between a plate over which the receptacles are propelled by the feed wheel and the feed wheel itself in order that irregularities in the impulses given to the feed wheel may be dampened.

It is customary practice to provide a guide rail for insuring that the objects being moved by the feed wheel shall be held in firm engagement therewith. It has heretofore been proposed to use a relatively long spring that engages a plurality of the objects or receptacles being moved. However, when such a spring is adjusted to give the desired pressure at one point, it is apt to be flexed outwardly from the receptacles at other points, thereby exerting an uneven pressure along the circumference of the feed wheel. We propose to eliminate the foregoing difficulty by providing a guide rail with a plurality of relatively short adjustable springs each of which is adapted to engage not more than two objects or receptacles at any one time.

By adjusting several springs, it is possible to maintain a uniform pressure around the feed wheel, since the flexing in the short springs is not sufficient to materially change the pressure on the objects or receptacles in engagement therewith.

The accompanying drawings show one embodiment of our invention and are considered to be illustrative of the invention and not a limitation thereof, as it is contemplated that the same results may be obtained in different manners.

In the accompanying drawings,

Figure 1 is a plan view of a conveyor mechanism for a filling machine embodying our invention;

Figure 2 is a broken view, partly in elevation and partly in section, of a receptacle rest;

Figure 3 is a plan view of a segment of a conveyor guide rail embodying our invention;

Figure 4 is a view, partially in elevation and partially in section, of a guide rail taken along the section line IV—IV of Figure 3;

Figure 5 is an inverted plan view of a feed wheel embodying our invention; and

Figure 6 is a broken sectional view of the feed wheel and guide rail taken along the section line VI—VI of Figure 1.

Referring to Figure 1, our invention may comprise a rotating machine 2 which may be a filling machine or any other type of machine receiving articles 3 such as cans, from a feed wheel 4 and conveyor 5 and automatically delivering them to another feed wheel 6 having an improved guide rail or track 7. While the machine 2 is herein illustrated as a filling machine, it is to be understood that the operation of the feed wheels 4 and 6 is applicable to many other types of machines and that they may be adapted for transporting articles other than cans.

Referring to Figures 1 and 2, the filling machine 2 may comprise an apron 8 supported on and driven by a shaft 9 connected to a drive shaft 10 and a drive chain 11. The apron 8 serves as a guide for a plurality of receptacle rests 12 each of which is provided at its lower end with a roller 14 that cooperates with a cam track 15 embodied in the ma...
machine 2, and at its upper end with a seat 16 for the reception of a receptacle 3. A receptacle guide 17 is carried by each seat 16, the guides all being provided with a cutaway portion 18 permitting a finger 19 on the guide rail 7 to project behind successive receptacles as they are brought to a predetermined position in order to move them from the seats 16.

By reason of the rollers 14 and the cam surface 15, each rest 16 is given periodic vertical movement with respect to the apron 8 as the latter is rotated. The foregoing details of the rest 16 and actuating mechanism therefor may be of any preferred type many of which are well known in the art, as the details thereof constitute no part of the present invention except as they are necessary to complete the combinations hereinafter set forth.

The feed wheel 6 and the cooperating conveyor 5 may be of any preferred form for delivering receptacles onto a plate 20 and then onto the rests 16 as the latter are brought to the level of the plate 20 during their movement. The feed wheel 6 is adapted to receive the filled receptacles 3 from the rests 16 by the action of the finger 19, which action is well known in the art. The receptacles 3 when delivered to the feed wheels 6 are filled and accordingly, are apt to spill and slop over if they are given an uneven or irregular movement. To secure the desired uniform movement we provide a hub 21 secured to the under face of the feed wheel 6 by bolts 22 the angular position of which may be adjusted in slots 24 in a flanged member 23 keyed to shaft 41. The plate 20 is provided with an upwardly projecting stud 25 that cooperates with a pocket 26 in a semi-circular brake element 27 and a cooperating semi-circular brake element 28. The brake elements 27 and 28 may be provided with a lining 29 of leather or other suitable friction material, and their tension may be adjusted by tensioning bolts 30.

Referring to Figures 3 and 4, the guide rail 7 is constituted by a finger 19 for engaging the receptacles as shown in Figure 3 and a plurality of sections 31 are adaptably mounted in slots 32 in the plate 20. The finger 19 is provided with an offset portion 33 at approximately the point where the receptacles 3 are moved onto the plate 20. Springs 34 are mounted on the rail 7 for engaging the receptacles and for constituting a continuation of the inner edge of the finger 19 such that the receptacles 3 are not deflected from their normal path when opposite the offset portion 33. The length of the springs 34 is preferably such that they engage but two of the receptacles at any time in order that a uniform pressure may be applied thereto. The pressure may be varied by adjusting the position of the supporting blocks 35 for the springs.

Referring to Figure 6, supporting blocks 35 each comprises a body portion 36 secured to the rails 7 by a bolt 37 that extends downward through a washer 38 and into the slot 32. The bolt 37 is provided with a nut 39, the inner face of which may engage and fit into the slot 32, if desired. A dowel pin 40 may be provided for preventing relative movement between the body 36 and the rail 7.

In the operation of our invention, the empty receptacles 3 are fed to the conveyor 5 in any suitable manner, or by hand. The feed wheel 4 conveys them to the seats 16 and guides 17 on the machine 2. As the machine 2 rotates, the seats are raised and lowered in the desired sequence in order to fill the receptacles 3 and to deliver them to the feed wheel 6 at the proper elevation. When the receptacles reach approximately the center line connecting the shaft 9 and the shaft 41 of the feed wheel 6, they are engaged by the inner face of the finger 19 and moved out of the guides 17 by pockets along the edge of the feed wheel. As the receptacles 3 move onto the plate 20, they are engaged by the first spring 34 that projects inwardly over the offset portion 33 of the rail 7 in order that the receptacles 3 shall not be given a sudden radial movement. The springs 34 crowd the receptacles 3 inwardly against the pockets of the feed wheel 6 without too great a frictional engagement. As the receptacles 3 travel, they pass by successive springs 34 until the discharge point for the feed wheel 6 is reached, where they may be delivered to any other mechanism shown diagrammatically by a dotted line circle in Figure 1. The length of the springs 34 is preferably such that they never engage more than two receptacles at any time. We have found that it is possible to adjust a plurality of relatively short springs so that they exert uniform pressure upon the receptacles passing over them, whereas with a longer spring one receptacle will be engaged with a greater pressure than are the other receptacles.

It will thus be seen that we have provided an improved feed wheel for filling machines characterized by the use of a friction brake preferably located between the feed wheel and the supporting plate, and operative to dampen out any irregularities in the movement of the feed wheel. Also the guide rail for the feed wheel is provided with a plurality of relatively short springs such that the receptacles travel along the rail under uniform pressure.

It is to be understood that various changes in the size, shape, arrangement and method of operation of the component parts of our invention may be made within the scope of the appended claims.

We claim:

1. The combination with a plurality of receptacle rests, of a discharge finger for moving receptacles from the rests, the discharge
finger having an offset portion in the line of travel of the receptacles therealong, a feed wheel cooperating with the discharge finger, and a series of springs overhanging the offset portion of the discharge finger and disposed opposite the feed wheel for engaging the receptacles.

2. In a feed wheel mechanism, the combination with a feed wheel and a base, of a friction brake comprising an element rigidly connected to the wheel and a cooperating element held against rotation for reducing irregularities in the circumferential movement of the said wheel, and a plurality of short springs for engaging a plurality of receptacles being moved by the feed wheel and securing uniform movement thereof with the feed wheel.

3. In a feed wheel mechanism, the combination with a feed wheel and a base, of a friction brake comprising an element rigidly connected to the wheel and a cooperating element held against rotation for reducing irregularities in the circumferential movement of the feed wheel, and a plurality of short springs disposed in spaced circumferential relation to the feed wheel for preventing relative radial movements between the feed wheel and a plurality of receptacles being moved thereby.

4. In a feed wheel mechanism, the combination with a feed wheel and a base, of a friction brake comprising an element rigidly connected to the wheel and a cooperating element held against rotation for reducing irregularities in the circumferential movement of the feed wheel, and a plurality of short springs disposed in spaced circumferential relation to the feed wheel for maintaining receptacles being moved by the feed wheel in firm engagement with the feed wheel, whereby slippage and irregular relative movement between the feed wheel and receptacles being conveyed is prevented.

In testimony whereof we have hereunto set our hands.

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