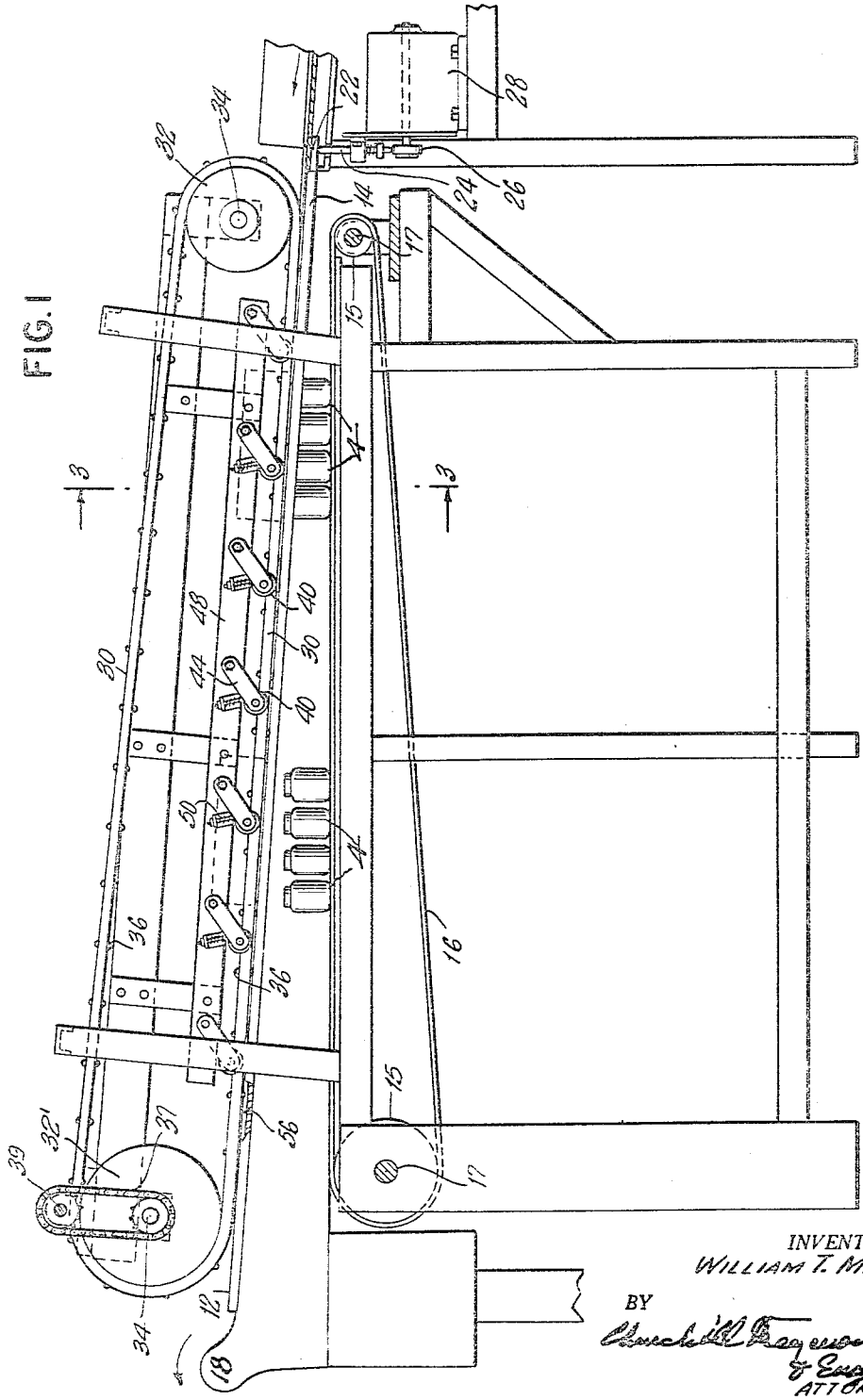
May 3, 1960 W. T. MARTIN 2,935,217

MACHINES FOR UNLOADING JARS OR THE LIKE FROM CARTONS

Filed July 29, 1957 3 Sheets-Sheet 1

FIG. 1



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MACHINES FOR UNLOADING JARS OR THE LIKE FROM CARTONS

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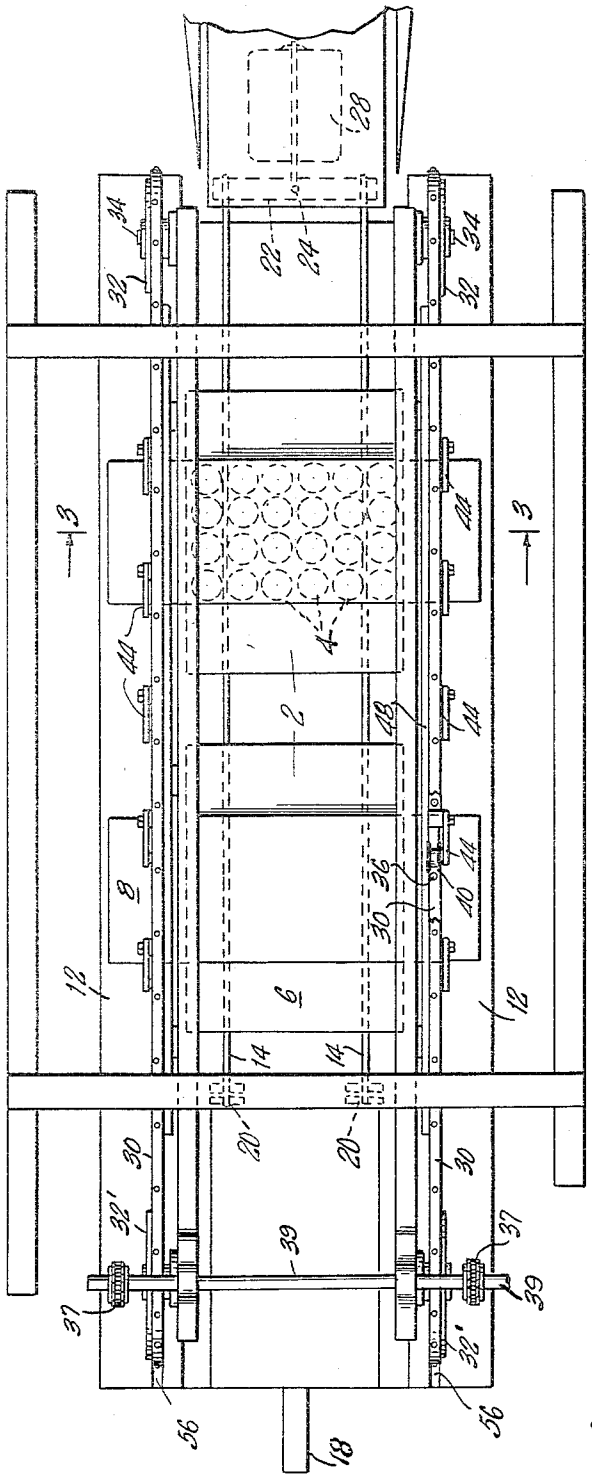


FIG. 2

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MACHINES FOR UNLOADING JARS OR THE LIKE FROM CARTONS

Filed July 29, 1957 3 Sheets-Sheet 3

FIG. 3

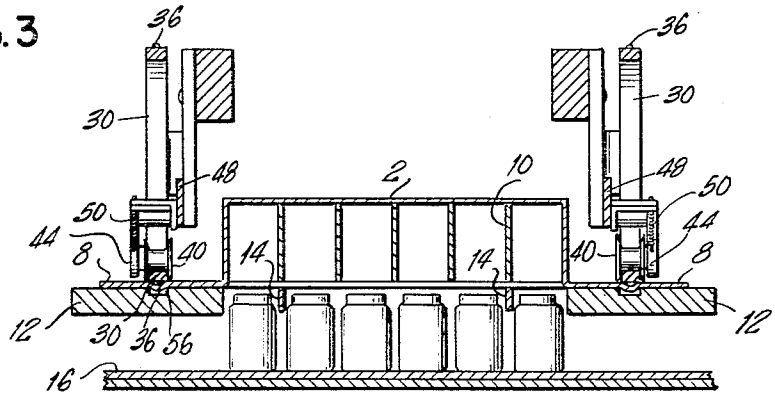


FIG. 5

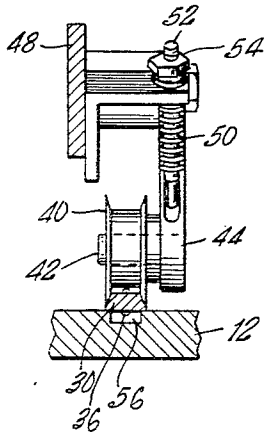
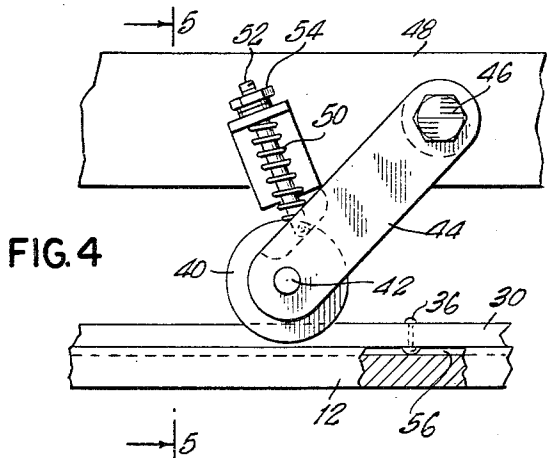


FIG. 4



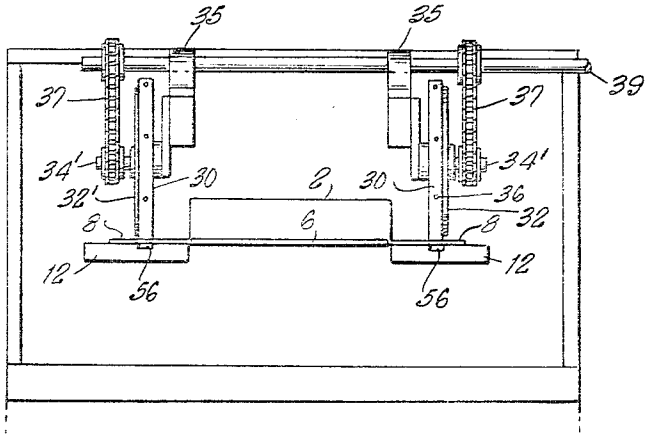


FIG. 6

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United States Patent Office 2,935,217
Patented May 3, 1960

2,935,217

MACHINES FOR UNLOADING JARS OR THE LIKE FROM CARTONS

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Application July 29, 1957, Serial No. 674,693

4 Claims. (Cl. 214—311)

The present invention relates to machines for opening cartons containing jars or similar articles, and for removing the jars from the cartons and delivering them to a jar-filling or other machine.

The principal object of the invention is to provide novel and improved carton-guiding and feeding devices for a machine of this character.

The several features of the invention, whereby these and other objects may be attained, will be readily understood from the following description and accompanying drawings, in which:

Figure 1 is a side elevation of a portion of a machine showing my improved carton-guiding and feeding devices in their preferred form;

Fig. 2 is a plan view of the same;

Fig. 3 is a sectional view, partly in elevation, taken on the line 3—3 of Figs. 1 and 2;

Fig. 4 is a detail side view, partly in section, of one of the carton-feeding devices employed in the machine;

Fig. 5 is a sectional view, taken on the line 5—5 of Fig. 4; and

Fig. 6 is a rear end elevation of the upper portion of the machine.

The machine illustrated in the drawings is of the type of the one described and claimed in the application of Thomas E. Rose, "Machine for Unloading Jars or the Like From Cartons," Serial No. 654,055, filed April 18, 1957.

This machine is particularly adapted for use in opening and emptying cardboard cartons **2** commonly employed for packing small glass jams **4**, such as those for containing baby foods. The cartons are provided with the usual outer flaps **6** and inner flaps **8**, and the jars are held separated in the cartons by means of the usual cardboard dividers **10**.

The cartons are supplied to the machine in inverted position with their flaps closed but unsecured, and the jars are placed in the cartons in inverted position and hence are in upright position when the cartons are thus in inverted position.

Previously, however, to the cartons reaching the portion of the machine illustrated, suitable devices first open the outer flaps and then the inner flaps. As each carton enters said portion of the machine the two sets of flaps are supported in horizontal position with the outer flaps **6** projecting fore and after of the cartons and the inner flaps **8** projecting laterally.

As the cartons enter the portion of the machine illustrated, the inner flaps **8** are supported by upwardly and outwardly inclined rails **12** over which they slide. The outer flaps **6** are supported by one or more vibrating bars **14** which also support the cartons. The bars **14** are narrow and are engaged by the cartons between rows of jars.

The filled cartons are intermittently delivered to the illustrated portion of the machine by suitable means (not shown). As they are delivered over the vibrating bars **14** and over the rails or tracks **12**, they are fed continuously over the track at such speed, with relation to the rate of intermittent delivery of the cartons to the rails, as to cause the cartons to be spaced apart predetermined distances on said rails. The means for thus feeding the cartons along the rails will be hereinafter described.

As the cartons ride over the inclined rails **12**, the jars **4** drop therefrom upon a conveyor belt **16** which is continuously driven at substantially the same surface speed as the cartons so as to cause the groups of jars from the cartons to be deposited in spaced relation on the conveyor belt. The conveyor belt **16** passes over pulleys **15** on shafts **17**, the front one of which is driven through connection with the main drive (not shown) of the machine.

The vibrating bars **14** in addition to supporting the cartons and the dividers **10**, vibrate the cartons to dislodge the jars therefrom and cause them to be gently deposited on the conveyor **16**.

As the empty cartons leave the rails **12**, they are discharged from the machine by riding over an abutment **18** which causes them to turn into upright position.

The jars **4**, as they leave the conveyor belt **16**, may be guided and conveyed to a jar-filling or other machine by suitable means.

Except as hereinafter described, the parts above referred to may be and preferably are the same as in the machine of said Rose application Serial No. 654,055.

In the illustrated machine there are two vibrating bars **14** and they respectively are positioned so as to engage the cartons and divider between the outer rows of jars. This insures uniform support and vibration imparted to the jars as the cartons are conveyed along the rails or track **12**. As shown, the bars **14** are pivoted at their rear ends **20**, and their front ends are secured to a crossbar **22** which is engaged by a vertical rod **24** which is vibrated by a cam **26** secured on the end of the shaft of an electric motor **28**.

In the present machine, the cartons are conveyed over the rails or track **12** by means of two belts **30** which are respectfully arranged to engage the inner flaps **8** on the rails.

The front ends of the belts **30** pass over pulleys **32** on a shaft **34** supported on the machine frame. The rear end of the belts pass over pulleys **32'** on shafts **34'** (Fig. 6) that are supported by frame brackets **35**. The shafts **34** are driven so as to drive the belts **30** by sprocket chains **37** that pass over sprocket wheels on said shafts, and on a shaft **39**. The shaft **39** may be driven, to drive the belts **30** at the speed of the conveyor belt **16**, through a suitable driving connection (not shown) with the rear shaft **17** of the belt conveyors. Thus the cartons are fed by the belts **30** at the same speed as the jars are fed by the conveyor **16**.

The belts are provided with projections which, as shown, are in the form of rivets **36**, the outer heads of which are rounded or slightly pointed and are adapted to engage the carton flaps.

In the illustrated machine, means are provided for pressing the lower length of the belts **30** toward the rails **12** so as to cause the rivet heads **36** to be firmly pressed into the carton flaps and thus uniformly feed the cartons along the rails.

As shown, such means comprises grooved rollers **40** which substantially fit over the lower length of the belts, said belts having tapering sides which are engaged by the sides of the grooves in the rollers so as to effectively hold the lower belt lengths from bending or flexing laterally during their travel over the rails.

Each roller **40** is mounted on a pin **42** on the lower end of an arm **44** having its other end pivoted on a bolt **46** secured on a frame beam **48**. Each arm **44** is pressed downwardly to press its roller against the belt by means of a spring **50** which is coiled about a rod **52** having one

end pivotally connected with the arm and its other end extended through an adjusting nut **54** in a bracket projecting from the associated frame beam **48**. By adjusting the nut **54**, the tension of the spring **50** may be adjusted as desired to vary the pressure of the roller on the belt.

When the heads of rivets **36** of the lower belt lengths are out of engagement with the carton flaps they are received in clearance grooves **56** in the rails **12** so as not to interfere with the smooth running of the belts.

Heretofore, it has been a serious problem to properly feed the cartons along the rails **12** without placing pressure on the sides of the carton that would interfere with the discharge of the jars therefrom. It is apparent that with my improved carton-feeding means, the cartons are uniformly and positively fed and guided at the same rate as the jars are conveyed by their conveyor, and the jars are freely dischraged from the cartons.

What I claim is:

1. In a machine for unloading jars and the like from cartons of the class described, a track comprising upwardly and rearwardly inclined rails for receiving the cartons in inverted position and spaced apart one behind the other, the cartons having their inner and outer flaps in open position, the inner flaps of the cartons being folded into substantially horizontal position and extending over said rails, and means for feeding the cartons rearwardly over the rails comprising endless belts having their lower runs arranged over the rails and over the inner flaps of the cartons as the cartons are received on the track, said belts having outward projections for engaging said inner flaps, means for driving the belts in a direction to cause their lower runs to travel rearwardly over the rails, and means for applying yielding pressure to the lower runs of the belts for causing said projections to press into the material of the inner flaps to feed the cartons along the track, said track having longitudinally extending clearance grooves for receiving the projections that are arranged between the spaced cartons.

2. Apparatus for unloading jars and the like from cartons comprising, upwardly and rearwardly inclined track means including laterally extending rails for receiving said cartons in inverted position, said cartons having pivotal end and side flaps in open position, said carton side flaps being folded to extend laterally from said carton and adapted to advance slidably over said rails, means for advancing said cartons rearwardly along said rails comprising endless belts having lower runs arranged over said rails, said lower runs also arranged

over and substantially contiguous with the confronting surfaces of said carton side flaps as said cartons advance along said rails, projections on said belts for operatively engaging the confronting surfaces of said carton side flaps, means for driving said belts in a direction to cause the lower runs thereof to travel rearwardly over said rails, means for applying a pressure to the lower runs of said belts to cause the projections thereof to press into the material of the engaged carton side flaps whereby said cartons are fed along said track means, and clearance recesses extending along said rails and substantially aligned with the lower runs of said belts for receiving the projections thereof in the absence of carton side flaps.

3. Apparatus as defined in claim 2, said track means also including means extending therealong for vibrating said cartons as they advance along said rails.

4. Apparatus for unloading jars and the like from cartons comprising, upwardly and rearwardly inclined track means including laterally extending rails for receiving said cartons in inverted position, said cartons having pivotal end and side flaps in open position, said carton side flaps extending laterally and adapted to advance slidably over said rails, means for advancing said cartons rearwardly along said rails comprising endless belts having their lower runs arranged over said rails and over said carton side flaps as said cartons are received on said tracks and advance therealong, projections on said belts for engaging operatively said carton side flaps, means for driving said belts in a direction to cause the lower runs thereof to travel rearwardly over said rails, and means for applying a pressure to the lower runs of said belts to cause the projections thereof to press into the material of the engaged carton side flaps whereby said cartons are fed along said track means, said tracks having recesses substantially aligned with the lower runs of said belt for receiving said projections in the absence of a carton.

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