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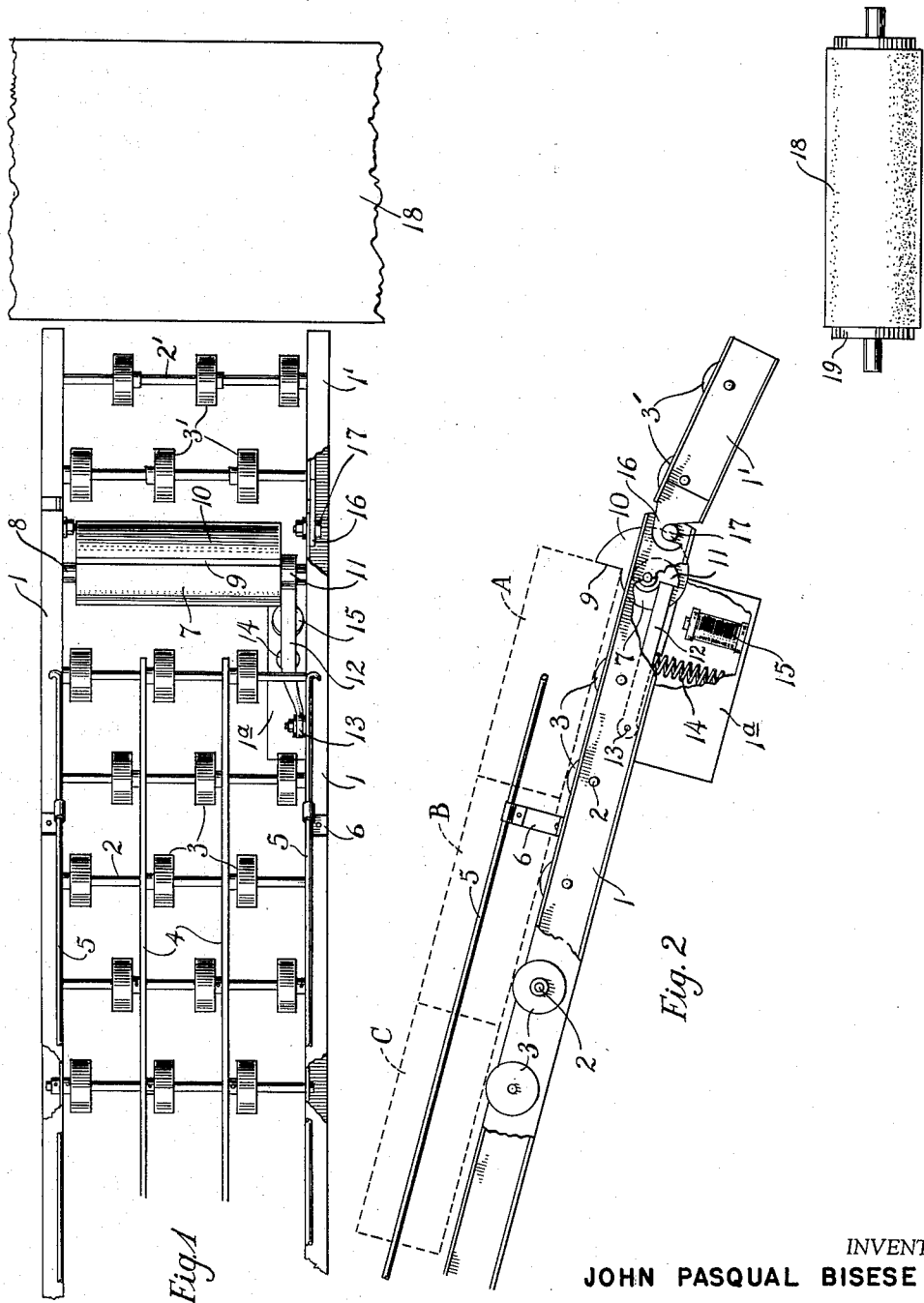
J. P. BISESE

2,738,103

PACKAGE DISPENSING APPARATUS

Filed June 29, 1955

2 Sheets-Sheet 1



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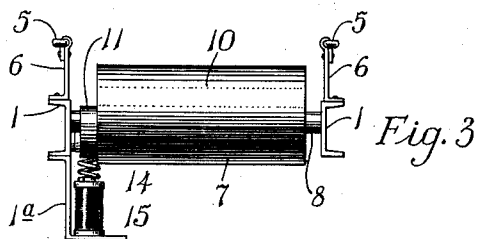
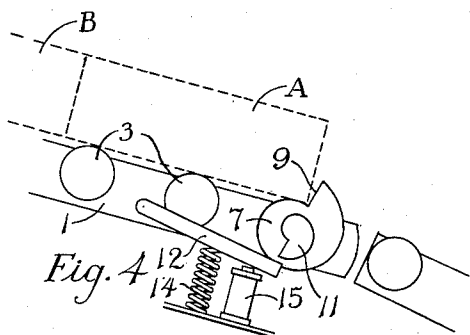
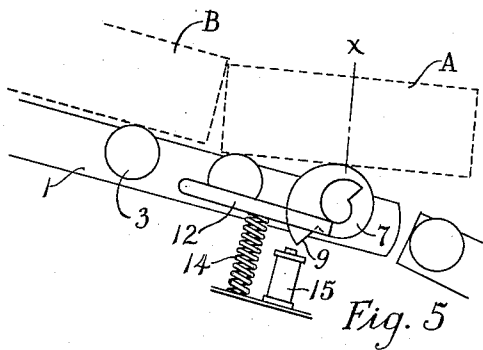
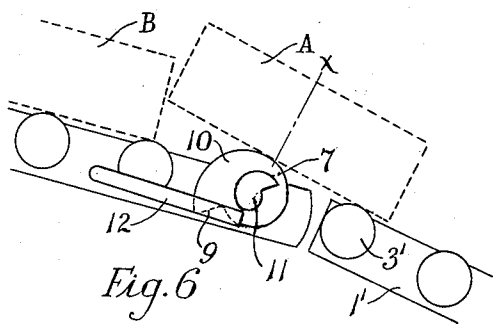
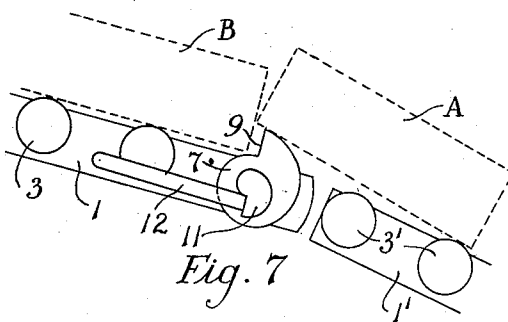
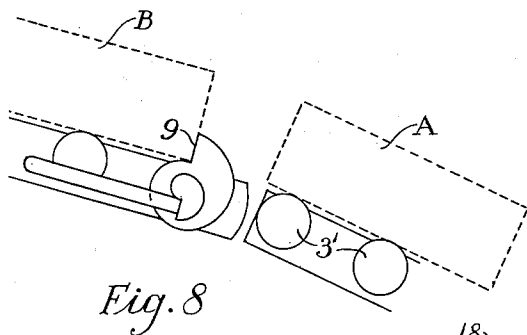
J. P. BISESE

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2 Sheets-Sheet 2



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2,738,103

PACKAGE DISPENSING APPARATUS

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4 Claims. (Cl. 221—295)

This invention relates to package or article handling apparatus, and more particularly to apparatus for feeding or dispensing packages, one at a time, from rows stacked in racks or chutes.

In general, the present invention is concerned with systems for storing and dispensing packages of merchandise in a warehouse, as illustrated, for example, in Patents Nos. 2,276,294 and 2,353,394 to Paul M. Farmer.

In such systems, a row of similar rectangular packages is stacked in an inclined rack or chute, so that, when unrestrained, the packages move down this chute by gravity, and are discharged from the lower end thereof. In the above mentioned patents, the packages are normally restrained from movement by engagement of the end of the lowermost package with a fixed abutment. Means are provided for lifting such end until it clears the abutment, when desired, so that the packages may slide down the rack or chute until the next package engages the abutment, the first package, meanwhile, having been pushed over the abutment and discharged.

In practice, it is, of course, desirable to release and dispense the packages by means controlled from a distance, and because of the relatively great force required to lift the packages over the abutment, the above described method is objectionable.

An object of the present invention is to devise improved, package-release mechanism in which a minimum of power is required to operate the same, and in which the force for canting the package as it leaves the chute is supplied by the weight and movement of the package itself.

Another object is to provide mechanism of the above character which shall be low in cost, simple in construction, and positive and efficient in operation.

With the above and other objects in view, and to improve generally on the details of such apparatus, the invention consists in the construction, arrangement and combination of parts hereinafter described and claimed, and illustrated in the accompanying drawings forming part of this specification, and in which:

Fig. 1 is a plan view of apparatus embodying the invention;

Fig. 2 is a side elevation thereof, parts being broken away;

Fig. 3 is an end elevation of the lower end of the apparatus shown in Fig. 2, parts being omitted for the sake of clearness; and

Figs. 4 to 8, inclusive, are fragmentary diagrammatic views similar to Fig. 2 showing successive steps in the operation of the apparatus.

Referring to the drawings in detail, my improved apparatus comprises an inclined rack or chute formed of a pair of spaced parallel frame members 1 between which extend a plurality of parallel shafts 2. On these shafts are mounted a plurality of rollers 3 of uniform size, these rollers serving to support the packages in a row, one behind the other in endwise abutting relation. Longitu-

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dinally extending brace members 4 are also preferably employed to connect the shafts 2, as shown in Fig. 1.

Guide rails 5, supported on brackets 6, are disposed at each side of the rack or chute to retain the packages in position.

At the lower end of the chute is a member 7 mounted to rotate on a transverse horizontal axis. This member 7 is shown as in the nature of a cylindrical cam or stop roller mounted on a transversely extending shaft 8, and formed with a radially and longitudinally disposed shoulder 9, as best shown in Fig. 2. The surface of the roller extending between the inner and outer edges of the shoulder 9 is in the form of a spiral cam 10.

Rigidly secured to the member 7 and rotating therewith is a catch or detent 11 constructed to be engaged by a longitudinally extending latch 12 pivoted at 13 to the frame 1. This latch is held in its upper position, shown in Fig. 2, by means of a spring 14, interposed between the latch and a bracket 1^a depending from the frame 1. When in this position, the end of the latch engages the detent and thus locks the stop roller against rotation.

Also mounted on the bracket 1^a, in a suitable position just below the latch 12, is an electromagnet 15. The latch 12 is made of steel or other magnetic material and serves as an armature for this magnet, so that when the magnet is energized the latch 12 is attracted and drawn downwardly out of engagement with the detent 11, thus releasing the stop roller 7 and permitting it to rotate.

At the lower end of the rack or chute, above described, and beyond the stop roller 7, I preferably provide an auxiliary chute 1'. This is formed at its upper end with a pair of hooks 16 which engage over studs 17 carried by the frame members 1, so that the auxiliary chute is supported on the main chute. In this auxiliary chute are mounted a plurality of rollers 3' similar to the rollers 3.

Beyond and below the auxiliary chute is preferably arranged a belt conveyor 18 carried by rollers 19, and adapted to receive the packages discharged from the auxiliary chute and convey them to any desired location.

It will be understood that while I have illustrated in the drawing only a single inclined rack or chute, a complete installation would comprise a large number of such racks or chutes, a group of them being arranged side by side in a common plane while other groups are arranged above them in superposed relation in parallel planes. Thus, a large number of such racks or chutes may be mounted in assembled relation in a warehouse or the like. The chutes lying in a common plane may all discharge onto the same conveyor, such as 18, and additional conveyors may be arranged in superposed relation to receive packages discharged from the upper groups of chutes. The conveyors 18 will be arranged to deliver the packages to some central point or loading platform where the packages may be conveniently handled.

The electromagnets 15 will of course be controlled from a switchboard at a central station, so that the operator positioned at such station may selectively operate any desired electromagnet in the entire warehouse and may thus selectively discharge onto the conveyor or conveyors 18 any desired packages from any of the racks or chutes.

It will be further understood that the packages stacked on any one rack or chute are all similar, and contain similar goods. Thus in a grocery warehouse, for example, one chute might contain cases of canned peas, another chute, cases of canned peaches, another chute, cases of sardines, etc. Thus, when any electromagnet is energized, a case of the desired goods will be discharged upon the conveyor and will thus be transported to the delivery point.

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The operation of the mechanism will now be described. In Fig. 2 a row of similar packages, disposed in end to end relation on the chute, and having flat ends and rectilinear bottoms, are indicated at A, B and C. The end of the lowermost package A is supported on the lowermost part of the cam and normally abuts against the shoulder 9 of the stop roller, and the entire row is thus held in position, the roller itself being locked by the detent 11 and latch 12. When the electromagnet 15 is energized and the holding means thus released, the weight of the package on the inclined chute causes the stop roller 7 to rotate, this roller being frictionally driven by the engagement of the lowermost package therewith as the roller turns, the package rides up on the cam, and is lifted thereby. The position of the parts immediately after the latch has been withdrawn is shown in Fig. 4. Fig. 5 illustrates the position of the parts a moment later, when the stop roller has turned approximately half way around and the package A is supported on this roller at approximately its mid-point x, in raised position.

Fig. 6 shows the position an instant later in which the center of the package has passed over the roller to a slight extent and the package tips over and begins to ride up on the high side of the cam 10. It will be noted that in this position the package A is being pushed forward by the package B. It will be further noted that, as the center of the package shifts over the roller from the position shown in Fig. 5 to that shown in Fig. 6, the package is canted or tilted to a different angle. This angle may approximate that of the auxiliary chute 1', which, as shown in the drawings, is disposed at a somewhat steeper incline than the main chute. Since the package is already raised to a higher plane, as above described, it is desirable to allow it to tilt, i. e., to allow the front end to drop, after its mid point passes over the cam, to enlist the aid of gravitation in causing an accelerated movement of the package.

It will be understood that in the carrying out of my invention, the periphery of the stop roller 7 must be chosen with regard to the length of the packages being dispensed. In practice, stop rollers will be made in different sizes or diameter, and will be interchangeable, so that a roller of suitable size may be employed in accordance with the length of the particular packages being dispensed.

It so happens that the sizes of packages used in the wholesale grocery trade are fairly well standardized, so that in order to handle, say, one thousand different items, not more than eight or ten different sizes of rollers would be required.

I find it advantageous to make the periphery of the roller slightly less than the length of the package, with the result that the stop shoulder 9, after the roller makes one revolution, returns to its starting position slightly before the package completely clears the roller. Thus, when the roller is stopped, after making one revolution, by reengagement of the latch 12 with the detent 11, the stop shoulder 9 has reached the proper position to be engaged by the next package, while the rear end of the lowermost package is still resting on the high point of the cam, as illustrated in Fig. 7. It may be considered as being pushed off by the succeeding package as the latter moves into engagement with the stop shoulder, but each package, including the last, will in fact travel completely down the chutes by gravity, under the influence of its own momentum.

In Fig. 8 is illustrated the final step in the operation, in which the first package is rolling down the auxiliary chute on its way to the conveyor 18, while the next package is stopped against the shoulder 9 of the cam roller.

From the foregoing it will be seen that I have provided a storage and dispensing system for packages having flat ends and rectilinear bottoms in which the packages move by gravity down an inclined chute and are released

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one at a time at each rotation of the stop roller. It will further be seen that this stop roller is operated by the weight of the packages themselves, and that the lifting of each package is accomplished by the cam roller which is frictionally driven by the package itself. Thus, the force required to operate my improved dispensing device is reduced to a minimum, the only power necessary being that sufficient to energize the magnet 15. It will be understood that the switch at the switchboard or control station (not shown) is so constructed that, when operated, it will energize the magnet 15 only momentarily, the spring 14 serving to return the latch to operative position, as shown in Fig. 5, immediately after the energization of the magnet, so that it is in position to engage the detent again when the latter reaches locking position.

What I claim is:

1. An inclined chute for supporting a series of similar rectangular packages for endwise linear movement, and means at the lower end of said chute for normally restraining the packages from movement and for dispensing the packages one at a time from said chute, said means comprising a stop roller in the form of a cylindrical cam extending transversely of the chute, means for normally holding said roller against rotation, said roller having a single radially and longitudinally disposed shoulder against which the flat end of the lowermost package abuts, remote controlled means for momentarily releasing said holding means so as to allow said roller to rotate and the packages to move, the lowermost package, when said roller is released, riding over and frictionally turning the same, and said holding means serving to stop rotation of said roller after it has made one revolution, and the shoulder has returned to its original position, the periphery of said roller and the length of the package being so proportioned that said shoulder will return to its original position slightly before the package has completely cleared the same.

2. An inclined chute for supporting a series of similar packages for endwise linear movement, said packages having flat ends and rectilinear bottoms, and means at the lower end of said chute for normally restraining the packages from movement and for dispensing the packages one at a time from said chute, said means comprising a rotary member in the form of a single cylindrical spiral cam extending transversely of the chute, the high side of the cam terminating in a radially disposed shoulder against which the flat end of the lowermost package abuts, means for holding said member against rotation, and remote controlled means for momentarily releasing said holding means so as to allow said member to rotate and the packages to move, the lowermost package, when said member is released, resting upon and frictionally driving the same, the rectilinear bottom of such lowermost package riding up on the high side of the cam as it turns, so that the package is lifted and canted thereby as it goes over, and said holding means serving to stop rotation of said member after it has made one revolution.

3. An inclined chute for supporting a series of similar elongated packages having flat ends and rectilinear bottoms for endwise linear movement, a transversely extending, horizontally disposed cylindrical spiral cam at the lower end of said chute, means for normally holding said cam against rotation, the lowermost package bearing against said cam and thus restraining all of the packages from movement, means for momentarily releasing said holding means to permit said cam to turn, said cam being so constructed and arranged that each successive package, moving under the influence of gravity, rides up on and turns said cam as it moves, and is lifted by the cam as the latter turns, and means for stopping rotation of the cam after it has made one revolution.

4. An inclined chute for supporting a series of similar elongated packages having flat ends and rectilinear bottoms for endwise linear movement, a transversely extend-

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ing, horizontally disposed cylindrical cam at the lower end of said chute, means for normally holding said cam against rotation, the lowermost package bearing against said cam and thus restraining all of the packages from movement, means for momentarily releasing said holding 5 means to permit said cam to turn, said cam being so constructed and arranged that each successive package, moving under the influence of gravity, rides up on and turns said cam as it moves, and is lifted by the cam as the latter turns, the periphery of the cam being so propor- 10

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tioned to the length of the package that the point of contact between the cam and package passes the center of the package as the cam turns, whereby, when the point of contact so passes the center of the package, the package tips over and changes its angular position, and means for stopping rotation of the cam after it has made one revolution.

No references cited.