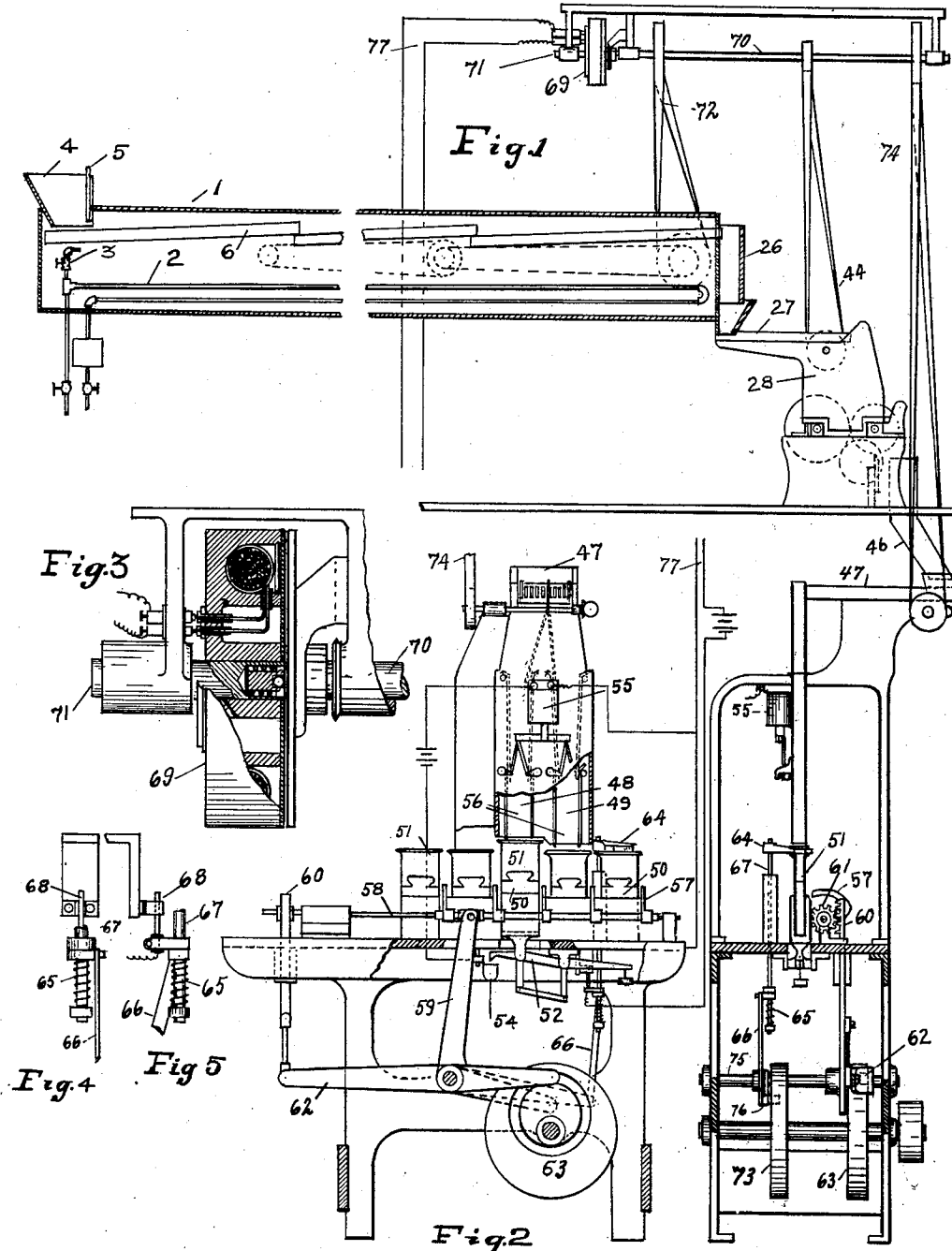


N. B. CONVERSE.
 PROCESS AND APPARATUS FOR SEEDING AND PACKING RAISINS.
 APPLICATION FILED SEPT. 19, 1906.

998,075.

Patented July 18, 1911.

3 SHEETS—SHEET 1.



WITNESSES:

Edward B. Nagp

INVENTOR

N. B. Converse,

BY

Geo. Wright,
ATTORNEY

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3 SHEETS—SHEET 2.

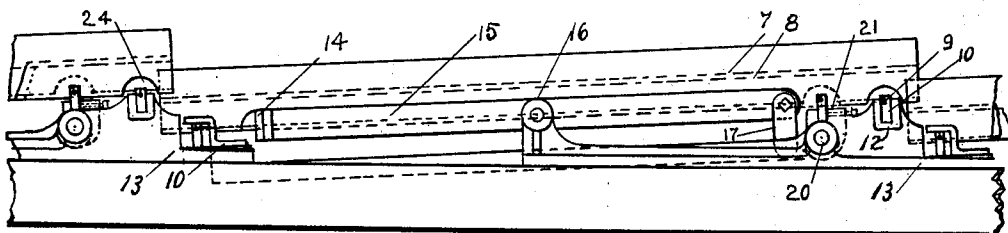


Fig. 6

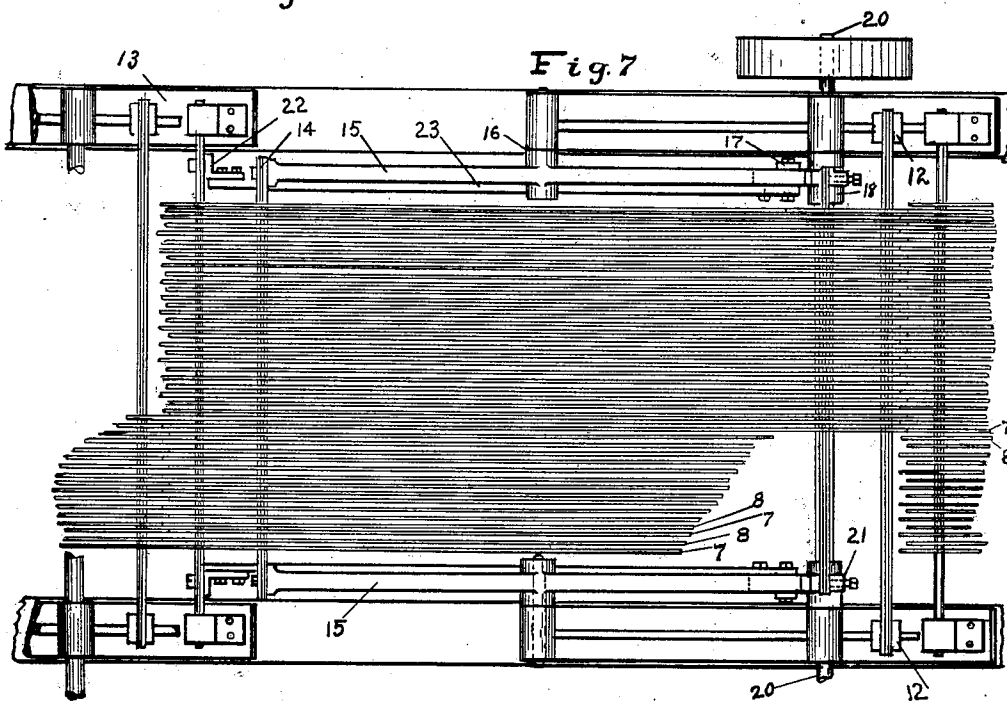


Fig. 7

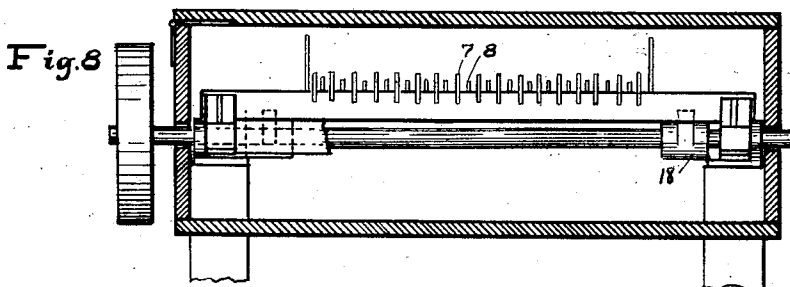


Fig. 8

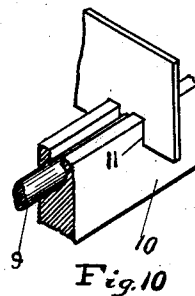


Fig. 10

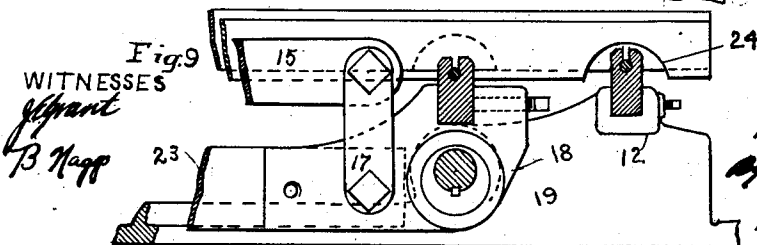


Fig. 9

WITNESSES
Edward
B. Hagg

INVENTOR
N. B. Converse
 BY *J. M. Wright,*
 ATTORNEY

N. B. CONVERSE.
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3 SHEETS—SHEET 3.

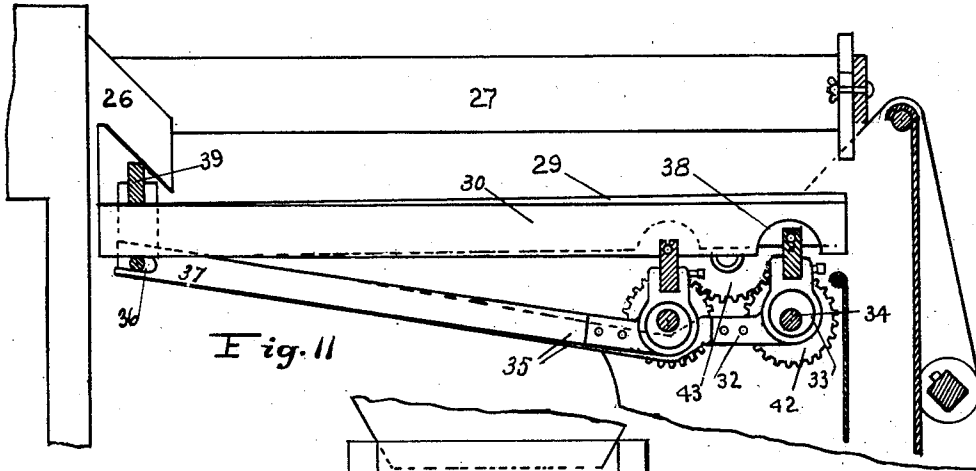


Fig. 11

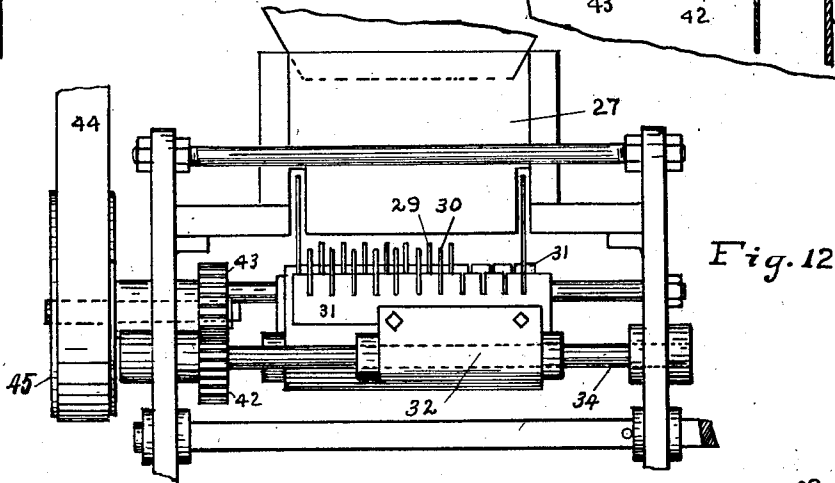


Fig. 12

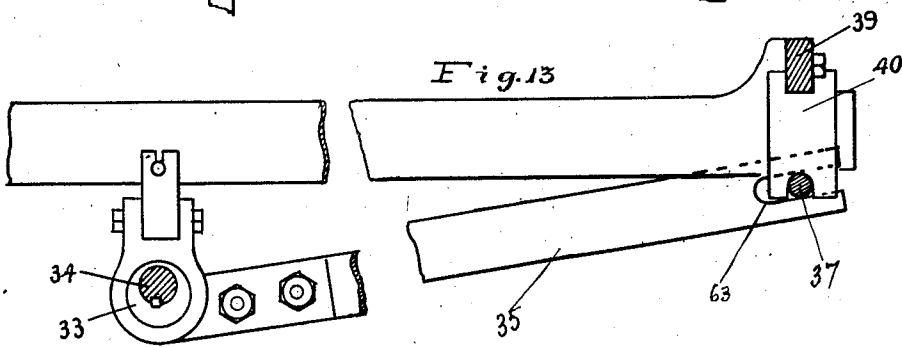


Fig. 13

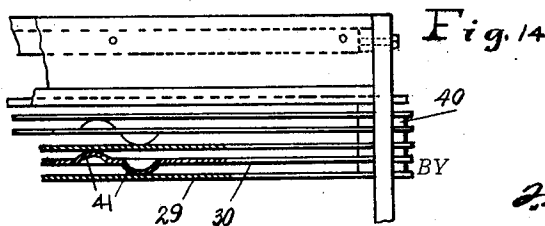


Fig. 14

WITNESSES:

J. Grant
B. Nagge

INVENTOR,

N. B. Converse

J. M. Swift

ATTORNEY.

UNITED STATES PATENT OFFICE.

NEWTON B. CONVERSE, OF FRESNO, CALIFORNIA, ASSIGNOR TO NEWTON B. CONVERSE, J. E. DICKINSON, FRANCIS M. WRIGHT, B. W. NORTON, L. Z. ICKES, AND K. ARAKELIAN, TRUSTEES.

PROCESS AND APPARATUS FOR SEEDING AND PACKING RAISINS.

998,075.

Specification of Letters Patent.

Patented July 18, 1911.

Application filed September 19, 1906. Serial No. 335,328.

To all whom it may concern:

Be it known that I, NEWTON B. CONVERSE, a citizen of the United States, residing at Fresno, in the county of Fresno and State of California, have invented new and useful Improvements in Processes and Apparatus for Seeding and Packing Raisins, of which the following is a specification.

This invention consists of an improved method of treating raisins, in the art of seeding and packing the same, subsequent to the drying and cleaning stage, and up to the time when they are weighed or measured for packing in cartons of uniform size as described and claimed.

The object of the present invention is to secure as nearly as possible a uniform quantity of raisins in such cartons.

Unless the amount packed in each carton is substantially the same, the machine is a commercial failure, for it is not permissible to sell these cartons under weight, and a small excess of weight in each carton amounts to a great loss at the end of a day's run of one of these machines. The inability of all prior forms of machines to pack the cartons uniformly is due to the character of seeded raisins, which are so sticky that they naturally agglomerate in masses whenever they come into contact, rendering it difficult to feed them mechanically, and cut off the feed when a given amount has already been fed. This stickiness cannot be avoided, for it is due to the extrusion of the pulp of the raisin with the seeds when the latter are forced out of the body of the raisin in the process of seeding. On account of this unavoidable stickiness, it has generally been pronounced by seeded raisin packers to be impossible to devise a machine which would, in feeding the raisins to the cartons, separate them so that the feed could be stopped when a given amount has been reached. Instead, however, of trying to break up these masses of seeded raisins, and, while maintaining the individual raisins separate, feed them to the packing machine in a stream sufficiently fine and uniform in flow to permit of their being uniformly packed, I have invented a new method of treatment of raisins in the process of seeding them and transferring them to the packing machine, so that, while they are fed to the latter in a

uniform fine stream, they are never allowed to agglomerate, and thus the necessity of breaking up agglomerated masses is avoided.

My invention also relates to apparatus convenient for carrying out such novel process.

In the accompanying drawings, Figure 1 is a broken side view of such apparatus, the filling and weighing machine being shown in end elevation; Fig. 2 is a broken side view of the filling and weighing machine; Fig. 3 is a broken detail view of the electro-magnet clutch; Fig. 4 is an enlarged end view, and Fig. 5 an enlarged side view, of the funnel controller; Fig. 6 is a broken side view of the carrier mechanism in the sweating machine; Fig. 7 is a broken plan view thereof; Fig. 8 is a cross section thereof; Fig. 9 is an enlarged side view, partly in section, of the eccentric and the parts adjacent thereto; Fig. 10 is a broken perspective view of one of the cross bars; Fig. 11 is a side view, partly in section, of the conveyer leading to the seeding machine; Fig. 12 is a cross sectional view of the same; Fig. 13 is an enlarged broken side view, partly in section, showing one of the extensions, viewed from the opposite side to that of Fig. 11; Fig. 14 is a broken plan view, partly in section, of the conveyer.

Referring to the drawing, 1 indicates the casing of a sweating chamber, heated by a steam pipe 2, and into which, by a pipe 3, live steam may also be directly introduced to moisten the raisins. The raisins are fed into said chamber from a hopper 4, by means of an adjustable gate 5. In the ordinary process of seeding raisins, from which, up to this point, my process does not differ, the raisins so fed come to the hopper 4 from the cleaner in a hard, dry, and brittle condition, and, therefore at this stage, but no subsequent stage in the process of seeding and packing, have no tendency to cohere, but can be advanced in a uniform stream, or so that equal quantities of raisins pass a given point in successive equal intervals of time. The magnitude of the opening beneath the gate determines the rate of flow, in other words, the size of the stream of raisins. The raisins at the bottom of the hopper rest upon the first of a series of conveyers 6, these conveyers being in a substan-

tially horizontal series extending the length of the chamber of the sweater. Each set of conveyers slopes slightly upward and discharges at its forward end on to the rear end of the next set. The conveyer comprises two sets of conveyer blades, 7, 8, alternating with each other. The blades 7 of one set are attached at their forward ends to a rod 9 stationarily secured in a cross bar 10, which has a number of transverse grooves, as shown at 11, to receive said blades, the cross bar being secured in stationary blocks 12 supported upon the side beams 13. Said forward ends, therefore, do not change their position, but only swing upon the rod 9. The rear ends of the blades 7 are given a vertical oscillation and for this purpose they are similarly supported by blocks 14 secured to the rear ends of levers 15 fulcrumed at 16, the front ends of said levers being attached by vertical links 17 to saddles 18 carried on the rings of eccentrics 19 mounted upon a transverse shaft 20 driven from any suitable source of power. By reason of this eccentric movement of the saddle a vertically oscillating motion is imparted to the rear ends of the blades 7. The other set of blades 8 is given a double movement, their forward ends having a movement of oscillation, while the rear ends are given a movement of longitudinal reciprocation. This revolution of the forward ends is caused by their supporting blocks 21 being secured to the saddles 18, while the rear ends receive their longitudinal reciprocation by their blocks being attached to castings 22 connected by links 23 with the saddles 18.

The blades of each set are recessed on their under side, as shown at 24, to allow freedom of movement, where they pass over the cross bars supporting the other set. By means of the movements of these two sets of blades, alternating with each other, the raisins are caused to advance. At each end the second set of blades 8 advance when above the first set and move backward when below them, the first set 7 having no longitudinal movement. When the blades of the second set advance, they carry the raisins forward, but when they move back they leave the raisins resting on the blades of the first set. By this means the raisins are advanced from one group of conveyers to the next in succession through the entire series, being fed uniformly through the sweater and emerging at a uniform rate of flow.

It will be hereafter noted that, in the subsequent stages of the process, systems of conveyers are used somewhat similar to that used in the sweater. They differ, however, in point of speed, the conveyers in the sweaters being the slowest, and the subsequent conveyers having increasingly greater speeds, the object being to thin out the

stream of raisins in the later stages of the process. It is in furtherance of this end that in the conveyers of the sweating chamber, only one set of blades is given a longitudinal movement.

From the sweating chamber the raisins are discharged by a chute 26 on to a conveyer 27 which conveys the raisins to a seeding machine 28. The conveyer 27 is shown in detail in Figs. 10, 11, 12, 13, and 14, and comprises two sets of conveyer blades 29, 30, alternating with each other, the blades of each set resting in slots in a cross bar 31, which is secured at its ends to saddles 32, mounted on eccentrics 33 on shafts 34. The saddles are prevented from turning by means of rearward extensions 35 therefrom having forked ends 36 engaging the ends of a rod 37. The front ends of the blades are recessed in their lower edges, as shown at 38, where they pass over the cross bar supporting the other set. At their rear ends all the blades rest upon the rod 37, and are held down by a top bar 39, being spaced from each other at said rear end by washers 40. Intermediate of the ends, the blades are spaced from each other by bosses 41 stamped from the blades themselves, which contact with the sides of adjacent blades. Upon the two shafts 34 are mounted gears 42, meshing with a gear 43, so that they revolve in unison, the gear 43 being driven by a belt 44 and pulley 45. The eccentrics 33 are so arranged on the shafts 34 that when the blades of one set are revolving forward and upward, those of the other set are revolving downward and rearward. The forwardly and upwardly revolving blades carry the raisins forward, during the time that the other blades are returning rearwardly, and these in turn rise above the blades of the other set, and take the raisins therefrom and carry them onward. It will be seen that with this construction the raisins are carried to the seeding machine in a more rapidly flowing stream than when passing through the sweater, the object being to spread or thin out the stream of raisins to adapt it for the operation of said machine.

After passing through the seeding machine the raisins are extremely sticky. It is therefore more necessary than ever to maintain them in a uniformly moving stream to prevent them agglomerating, and it is also important to thin out this stream, both in order to more widely separate the raisins as they flow, and to cause them to fall into the cartons in as fine a stream as possible so that the automatic weighing or measuring device may act sensitively, shutting off the flow automatically with as small an excess of weight or volume as possible. For these reasons the raisins after dropping down a chute 46 are allowed to fall on to a

conveyer 47 similar to the conveyer 27 but driven at a higher speed.

The means for automatically weighing or measuring the proper quantity of raisins into the carton forms no part of my present invention and therefore need not be described with great particularity. As one of many such means which may be used there is shown in Figs. 1 and 2 a weighing apparatus comprising two chutes 48, 49, down which the raisins drop simultaneously into two cartons 50 of a series or file of such cartons, each carton being provided with a funnel 51 said funnel being movable downward in said carton. The fuller stream of raisins falls into the rear one of the two, the fourth in the row shown in Fig. 2. The more forward of the two cartons has already been more than half filled by raisins falling down the chute 49, and has been advanced on to a weighing scale 52, and in this position a fine stream of raisins falls into said carton down the chute 48. As soon as a sufficient weight of raisins has fallen thereinto, the scale pan descends, closing an electric circuit through a mercury contact 54, energizing a solenoid 55, and closing the gates 56 which control the chutes 48, 49. The cartons are then advanced by means of pushers 57 on a sliding and rocking shaft 58, a lever 59 serving to reciprocate the shaft, and a rack 60, meshing with a gear 61 on said shaft, serving to rock the shaft, said rack 60 being reciprocated by a lever 62, and the levers 59, 62 being actuated by cam grooves on opposite sides of a cam wheel 63 and swinging on the shaft 75. At the same time that the shaft 58 is moved backward, a depressor plate 64 pushes the funnel down into the carton, said depressor being carried by a rod 67, a spring 65 being interposed between the lower end of said rod and the end of a link 66 pivoted to the end of an arm 76, swinging on the shaft 75 and guided by a cam wheel 73. If no funnel has been inserted in the carton, or if the carton has not arrived, the link 66 descends lower than usual, and an electric contact 68 is broken in a circuit 77 energizing an electromagnet clutch 69, by means of which clutch motion is transmitted to the main shaft 70 from a shaft 71. Hence, when said contact is broken and said circuit is interrupted, the clutch 69 being deenergized, the shaft 70 stops, and the operations of the sweater, the seeder and the conveyer 27 and 47, are arrested, these machines being driven from said shaft 70 by belts 72, 44, 74. Thus the entire apparatus moves in unison, and automatically stops at any time that the cartons are not properly fed or prepared to receive the seeded raisins.

It will be seen from the above description that I treat the raisins by a new method and am thus enabled to pack them uniformly in

cartons by automatic weighing devices. I first start them in a uniformly flowing stream while they are in a hard, dry, and brittle condition, and then while, first, converting them into a soft condition, and afterward seeding them, which renders them extremely sticky, and, finally, while conveying them from the seeding machine to the packing apparatus, I maintain them in such uniformly flowing stream, so that they cannot agglomerate. Furthermore I increase the velocity of the stream, first, when leaving the sweater to go to the seeder, and, then, when leaving the seeder to go to the weigher or packer.

By far the greatest difficulty overcome by my invention is the tendency to adhere after passing through the seeding machine, the tendency being very much greater than before, on account of the extrusion of the pulp. Hence a process and an apparatus which overcomes this difficulty alone, without preventing the adhesion of the raisins before passing through the seeding machine, constitute an important advance in the art of, and means for, packing seeded raisins, and therefore may be considered an inferior modification of my invention. While, therefore, it is preferable to maintain the raisins separated from the time they are in a hard, dry and brittle condition, yet I consider that the above inferior modification to be included in my invention.

It is evident that by the words "a uniformly moving stream" in the claims is not meant that the velocity of the individual raisins shall be the same at all points of their path, but that the number of raisins passing a given point, or cross section of the path of the stream of raisins, shall be the same during successive units of time, provided that the measuring apparatus is operating uniformly. If the packing or measuring apparatus were operating not at a constant speed, but with an increasing or diminishing speed, then the velocity of the stream of raisins should also proportionately increase or diminish, and the words "a uniformly moving stream" should be thus interpreted, that is, with reference to the speed at which the measuring apparatus is being operated.

I claim:—

1. The method of treating raisins to feed them, freed from their seeds, to an apparatus for separating them into aggregations of uniform magnitude, which consists in starting the raisins when in a hard, dry, and non-adhesive condition in a uniformly moving stream, maintaining them in such motion and simultaneously sweating or softening them, transferring them in a uniformly moving stream of greater velocity to a seeding machine, seeding them, and transferring them in a uniformly moving stream

of still greater velocity from the seeding machine to said apparatus, substantially as described.

2. An apparatus of the character described comprising a sweating chamber, means for starting the raisins at their entrance into said chamber in a uniformly moving stream, means for maintaining them in such motion while in said chamber, a seeding machine, means for transferring them in a uniformly moving stream of greater velocity from the sweating chamber to the seeding machine, an apparatus for

separating the stream of raisins into aggregations of uniform magnitude, and means for transferring the raisins in a uniformly moving stream of still greater velocity from the seeding machine to said apparatus, substantially as described. 15

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses. 20

NEWTON B. CONVERSE.

Witnesses:

ALICE KELLY,

PHIL M. CHANDLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."