Jan. 7, 1958 E. J. VAN HOLTEN 2,818,975

PICKLE SORTING MACHINE

Filed Jan. 24, 1955 3 Sheets-Sheet 1

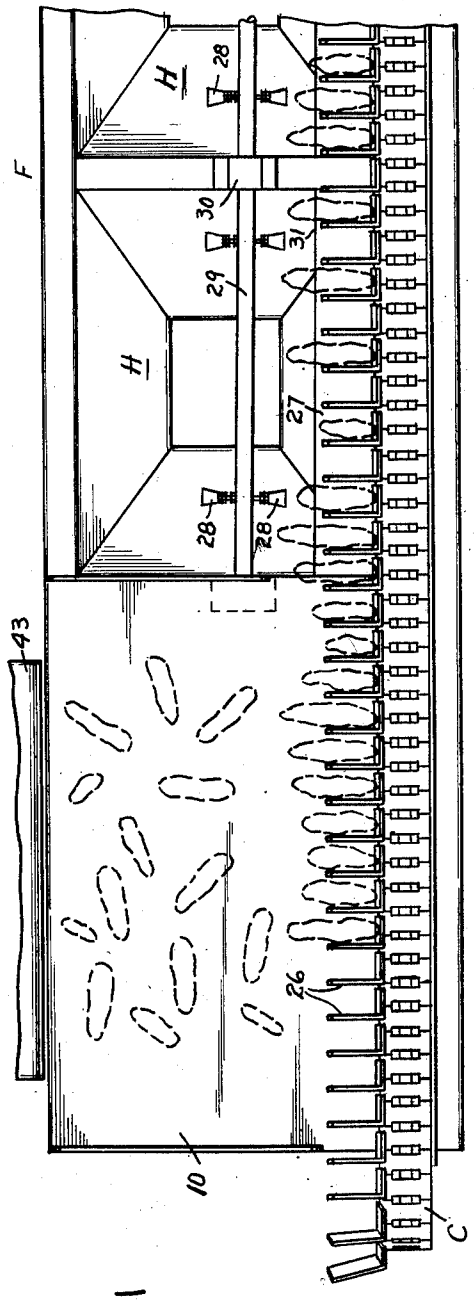


FIG. 1

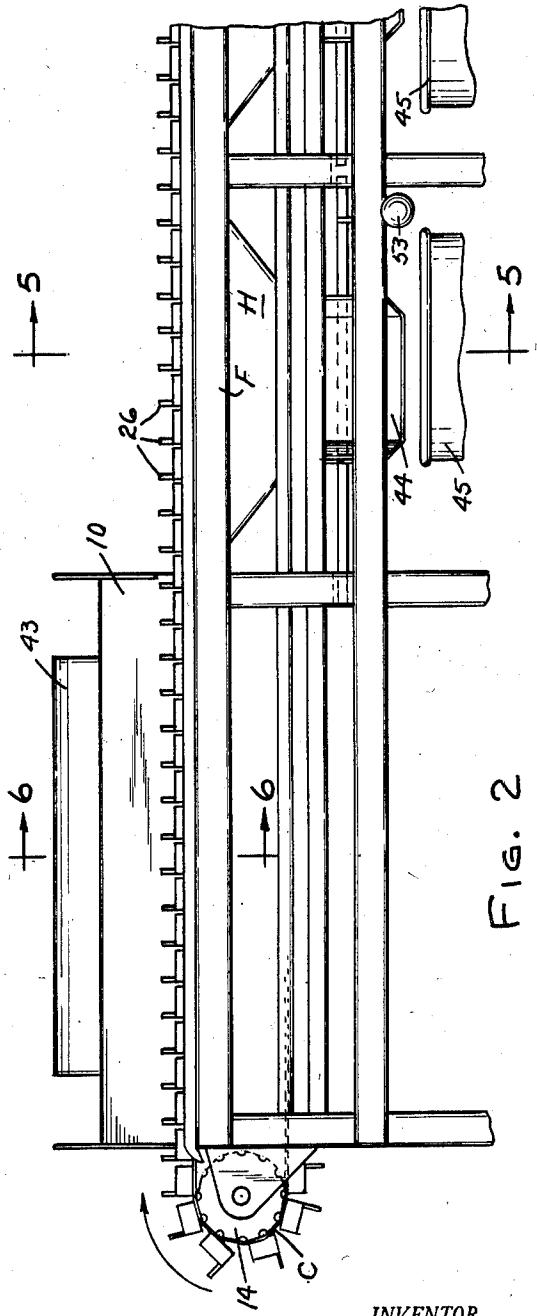


FIG. 2

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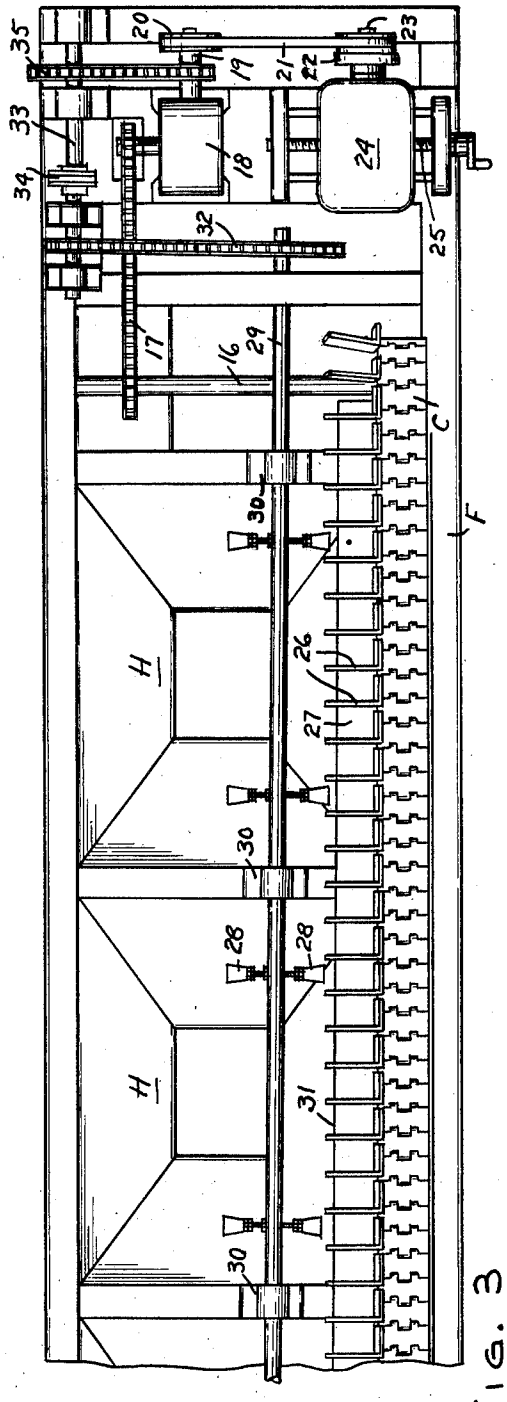


FIG. 3

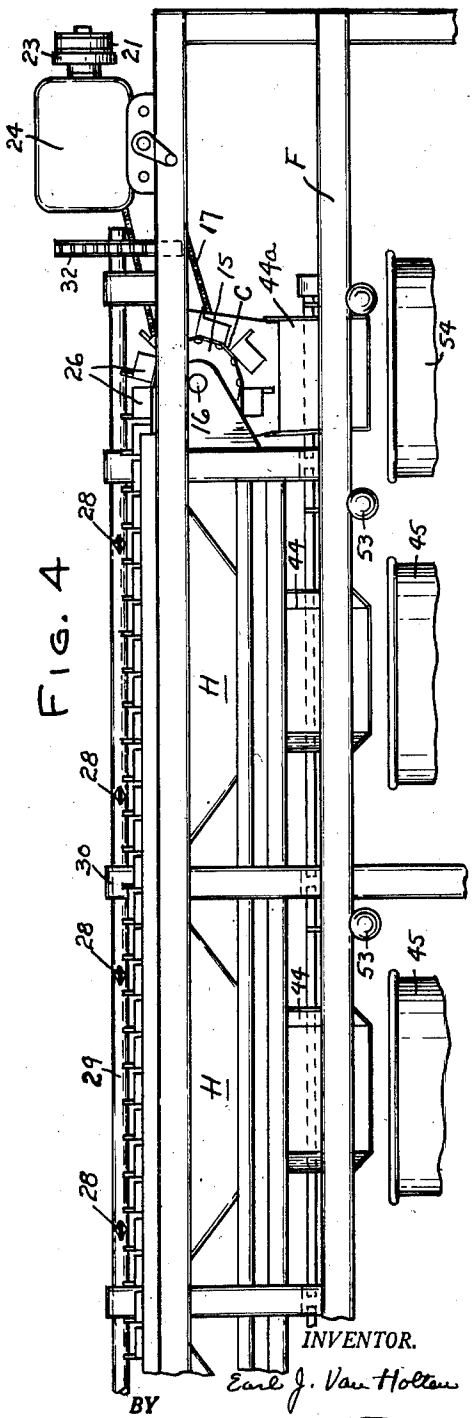


FIG. 4

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PICKLE SORTING MACHINE

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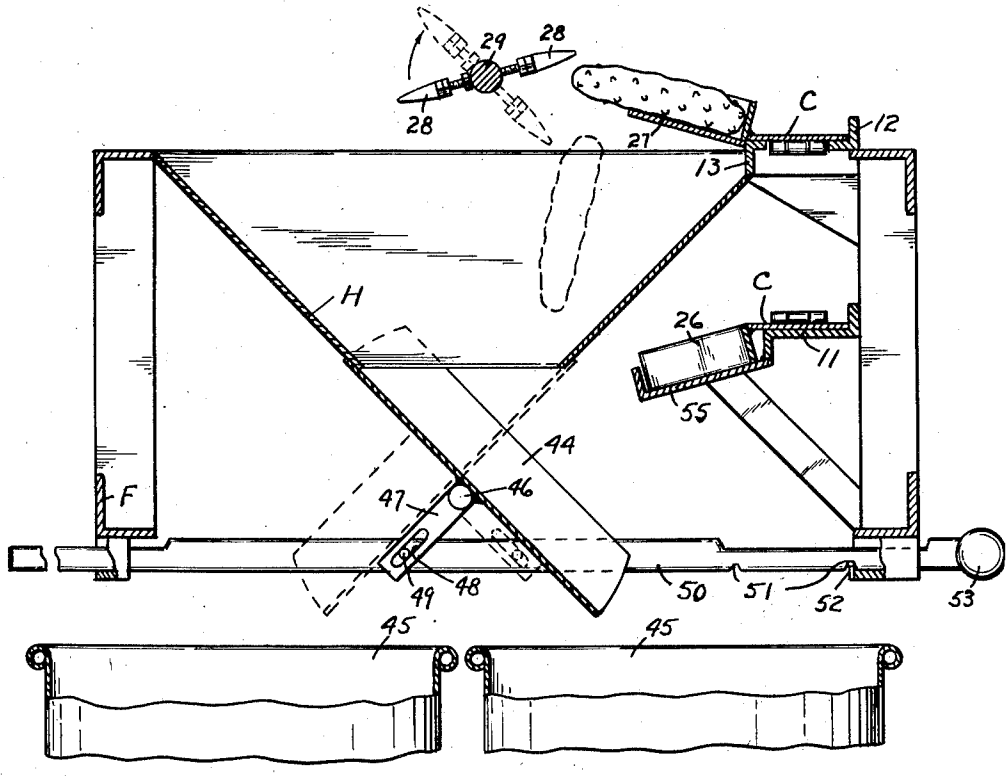


FIG. 5

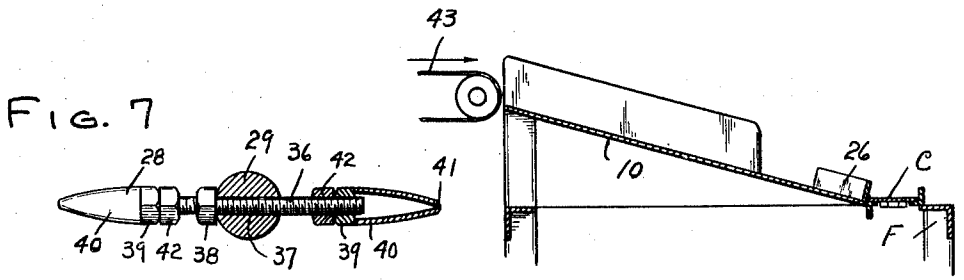
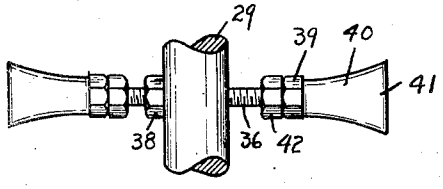


FIG. 6

FIG. 7

FIG. 8



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PICKLE SORTING MACHINE

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Application January 24, 1955, Serial No. 483,558

6 Claims. (Cl. 209—91)

The invention relates to a pickle sorting machine.

Heretofore in the pickle making industry it has been the practice to sort pickles as to length by hand into a number of different length sizes. The object of the present invention is to provide a machine for this sorting purpose, thereby saving labor cost and also increasing production of the finished product.

The invention further consists in the several features hereinafter described and more particularly defined by the appended claims.

In the drawings:

Fig. 1 is a plan view of the front end of a pickle sorting machine embodying the invention;

Fig. 2 is a side elevation view of this end of the machine;

Fig. 3 is a plan view of the rear end of the machine;

Fig. 4 is a side elevation view of the rear end of the machine;

Fig. 5 is a detailed vertical sectional view taken on the line 5—5 of Fig. 2;

Fig. 6 is a detailed vertical sectional view taken on the line 6—6 of Fig. 2;

Fig. 7 is an enlarged view partly in section and partly in elevation of one of the knocker devices;

Fig. 8 is an enlarged plan view of one of the knocker devices.

The cucumbers that are processed into pickles are of different lengths, and before the pickles can be placed in packages or jars, they are sorted into several distinct size lengths, most pickles coming within one or the other of six length sizes established by the industry though there may be some pickles smaller than the smallest established length size. The machine of this invention has been designed to sort the bulk pickles into six length size batches and an undersized batch. As the machine is of considerable length, some of the sorting sections have not been shown because of drawing space limitations, and those that have are considered sufficient for a clear explanation of the invention.

Referring to Figs. 1 to 5, the machine includes a long framework F provided at one end with a receiving table 10 and along one side with a lengthwise extending angled metal guide 11 for the lower run of an endless conveyor C and spaced lengthwise extending guides 12 and 13 for the upper run of said conveyor which runs over end sprockets 14 and 15 mounted on shafts journalled in the frame. The shaft 16 for the sprocket 15 is connected by a chain and sprocket drive connection 17 to the output shaft of a speed reducer 18 whose input shaft 19 carries a pulley 20 connected by a belt 21 to a variable speed drive pulley 22 mounted on the shaft 23 of an electric motor 24, the drive pulley 22 being of the type whose driving ratio is varied by the longitudinal adjustment of the position of the motor 24 by a feed screw 25.

The conveyor C has a plurality of angled plates 26 attached at spaced intervals thereto at its inner side so that these plates will be carried along with the conveyor

and on its upper run ride over a lengthwise extending upwardly inclined shelf 27. The spaced plates 26 form the sides and back and the shelf 27 the bottom of a plurality of pickle receiving compartments, one for each pickle to be sorted, the plates 26 acting as pushers to advance the pickles along the shelf. Shelf 27 is inclined upwardly at a slight angle to prevent accidental dislodgement of the pickles. The width of the shelf varies (preferably tapers) from its end adjacent the table 10 to its other end at the farther end of the upper run of the conveyor, being widest at its end adjacent table 10 and narrowest at its other end. The different shelf widths are such that for the pickles to be sorted, the longest or longer pickles will project out for about a third of their length from the wider parts of the shelf, and the shortest or shorter pickles will project out for about a third of their length from the narrower parts of the shelf.

One or more operators take pickles from the table 10 and load them into the compartments, one in each compartment, without regard to their lengths, and as these pickles travel with the conveyor over the shelf 27, they pass a series of spaced knockers 28 mounted on a lengthwise extending rotary shaft 29 journalled in bearing boxes 30 on portions of the frame. While not absolutely essential, the shaft 29 is disposed parallel to the tapered inner edge 31 of the shelf 27.

The shaft 29 is continuously rotated by a drive connection with the motor 24. This drive connection includes a chain and sprocket drive 32 from the shaft 29 to one of the sections of a lay or transmission shaft 33 having a universal joint connection 34 between its sections, the other section having a chain and sprocket drive connection 35 with the input shaft 19 of the speed reducer so that varying the speed of the shaft 19 will vary both the speed of the conveyor and the speed of rotation of the knocker carrying shaft 29.

The knockers 28 may be of any suitable construction but are preferably formed as shown in Figs. 7 and 8. Each knocker includes a threaded stud shaft 36 which extends through a threaded hole 37 in the shaft 29 and is locked in position by a lock nut 38. A knocker finger or paddle is formed by welding a nut 39 onto the back end of a piece of pipe 40 whose front end 41 is flattened by cutting this pipe section with a shear. The fingers thus formed are threaded onto the shaft 36 and locked in the desired position by a lock nut 42, this construction permitting the fingers in each section of the machine to project outwardly at the desired distance relative to the shelf 27. Since no two pickles are of exactly the same length, each class length that has been established by the pickle industry includes pickles varying from a maximum to a minimum length for that class. To accommodate this spread there are two sets of knockers for each sorting section.

Where the pickles are carried to the sorting machine by a conveyor 43, the table 10 may be inclined as shown in Fig. 6.

As the pickles carried along in the compartments, formed as heretofore described, pass the knockers 28, the outer ends of the longest pickles are struck by the knockers in the first sorting section and thereby up ended or canted upwardly at their back ends by tilting on the front edge of the shelf until they reach a position where they will slide or drop off this edge by gravity into an open bottom hopper H. From this hopper the pickles may be discharged onto a conveyor, not shown, or directed by an adjustable spout or chute 44 into one or the other of a pair of receptacles 45 disposed below the chute. The chute 44 is shown as carried by a shaft 46 pivoted on the frame and carries an arm 47 having a slot 48 engaged by a pin 49 on a slidable and tiltable shaft 50

mounted in suitable guides in the frame, the shaft **50** having spaced notches **51** adapted to selectively engage a locking tongue **52** on the frame to hold it in either of its operative positions and provided with a handle **53**.

As the pickles on the conveyor are carried along from section to section, the knockers **28** in any one section remove the pickles from compartments of the size length for this section until finally all of the pickles have been graded as to size except those too short to be hit by a knocker, and these undersized pickles are pushed off the narrow end of the shelf **27** onto an angularly adjustable chute *44a*, similar to the chute **44**, into one of a pair of receptacles **54**, one being indicated in Fig. 4.

The plates **26** are supported during their lower run by a channel guide **55**.

While a single knocker **28** at each shaft location may be used, the double knocker is preferred as it reduces the speed of rotation of the shaft **29** by a half. This speed of rotation of the shaft as compared to the speed of the conveyor is such that for every rotation of the shaft **29** the conveyor advances through a space equal to that of two pickle compartments so that one of the knockers **28** may engage and knock off a pickle in one of these compartments and the other oppositely disposed knocker engage and knock off a pickle in the next compartment.

It will be noted that the angle plates **26** and the shelf **27** from a series of open top, open front end compartments and that the depth of these compartments progressively decreases from the feed in station of the machine to the end of the upper run of the conveyor C and that as the pickles travel along in these compartments, they are progressively removed therefrom at the different sorting stations, their removal at any one sorting station depending upon how much of the length of the pickle projects beyond the shelf **27**.

It has been demonstrated by tests of a machine embodying this invention that pickles may be sorted at the rate of 17,000 pickles an hour or almost five pickles a second and without damaging the pickles.

I desire it to be understood that this invention is not to be limited to any particular form or arrangement of parts except in so far as such limitations are included in the claims.

What I claim as my invention is:

1. In a machine for sorting pickles into different length sizes, the combination of a frame, a lengthwise extending rotary shaft, a plurality of sorting stations through which said shaft extends, a pickle knocker on said shaft at each station, and means for feeding pickles past said sorting stations in individual pockets of varying length so that the free end of a pickle projects from its pocket in a sorting station corresponding to the desired sorting length and in the path of the knocker at this station acting on the free end of the pickle to remove the pickle from said pocket.

2. In a machine for sorting pickles into different length sizes, the combination of a frame, a pickle receiving station on said frame, a plurality of sorting stations along said frame, a shelf on said frame extending from said receiving station through said sorting stations and tapering from a wide section at said receiving station to a narrow section at the last sorting station, means for continuously feeding pickles transversely of and along said shelf in spaced apart condition, and rotary knocker means at each sorting station engageable with the end of a pickle that may project from said shelf to bodily fulcrum it about the tapered edge of the shelf to tip the other end upwardly relative to the shelf and permit it to drop down from the tapered edge of the shelf.

3. In a machine for sorting pickles into different length sizes, the combination of a frame, a lengthwise extending horizontally disposed rotary shaft, a plurality of sorting stations through which said shaft extends, pickle knockers mounted on said shaft in spaced relation at each station, and means for feeding pickles transversely past said sorting stations in individual pockets of varying length so that the free end of the pickles project from their pockets in a sorting station corresponding to the desired sorting length and in the path of the knockers at this station acting on their free ends to remove these pickles from said pockets.

4. In a machine for sorting pickles into different length sizes, the combination of a frame, a lengthwise extending horizontally disposed rotary shaft, a plurality of sorting stations through which said shaft extends, pickle knockers projecting from opposite sides of said shaft at each station, and means for feeding pickles transversely past the knockers in said sorting stations in individual pockets of varying length so that the free end of any pickle projecting from its pocket in a sorting station corresponding to the desired sorting length will be engaged by one or the other of the knockers at this station and be dislodged from said pocket.

5. In a machine for sorting pickles into different length sizes, the combination of a frame, a lengthwise extending shelf mounted on said frame, an endless conveyor having one of its runs extending along side said shelf, flight means on the conveyor running along the top of said shelf and cooperating therewith to form a plurality of transversely disposed open top, open front end pockets to receive pickles in a transversely disposed resting position on said shelf, one in each pocket, and carry them along said shelf, said shelf forming the bottoms of said pockets and being of varying width so that the bottoms of said pockets are of varying length as the conveyor moves from a pickle receiving position to the end of its run so that different length pickles project outwardly of the pockets at different portions of the run of the conveyor, a plurality of sorting stations adjacent said shelf, and movable means at each sorting station to engage the projected free end of a pickle carried along in one of said pockets to up end it about the front edge of said shelf as a fulcrum to permit it to drop from said shelf.

6. In a machine for sorting pickles into different length sizes, the combination of a frame, a lengthwise extending shelf mounted on the frame, an endless conveyor running along side of said shelf, flight means on the conveyor cooperating with said shelf to form a plurality of transversely disposed open top, open front end pockets to receive pickles in a transversely disposed resting position on said shelf, one in each pocket, and carry them along said shelf, said shelf forming the bottoms of said pockets and being of varying width so that the bottoms of said pockets are of varying lengths as the conveyor moves from a pickle receiving position to the end of its run so that different length pickles project outwardly of the pockets at different portions of the run of the conveyor, a plurality of sorting stations adjacent said shelf, and rotary knocker means at each sorting station to engage the projected free end of a pickle carried along in one of said pockets and up end it about the front edge of the shelf as a fulcrum to permit it to drop from said shelf.

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