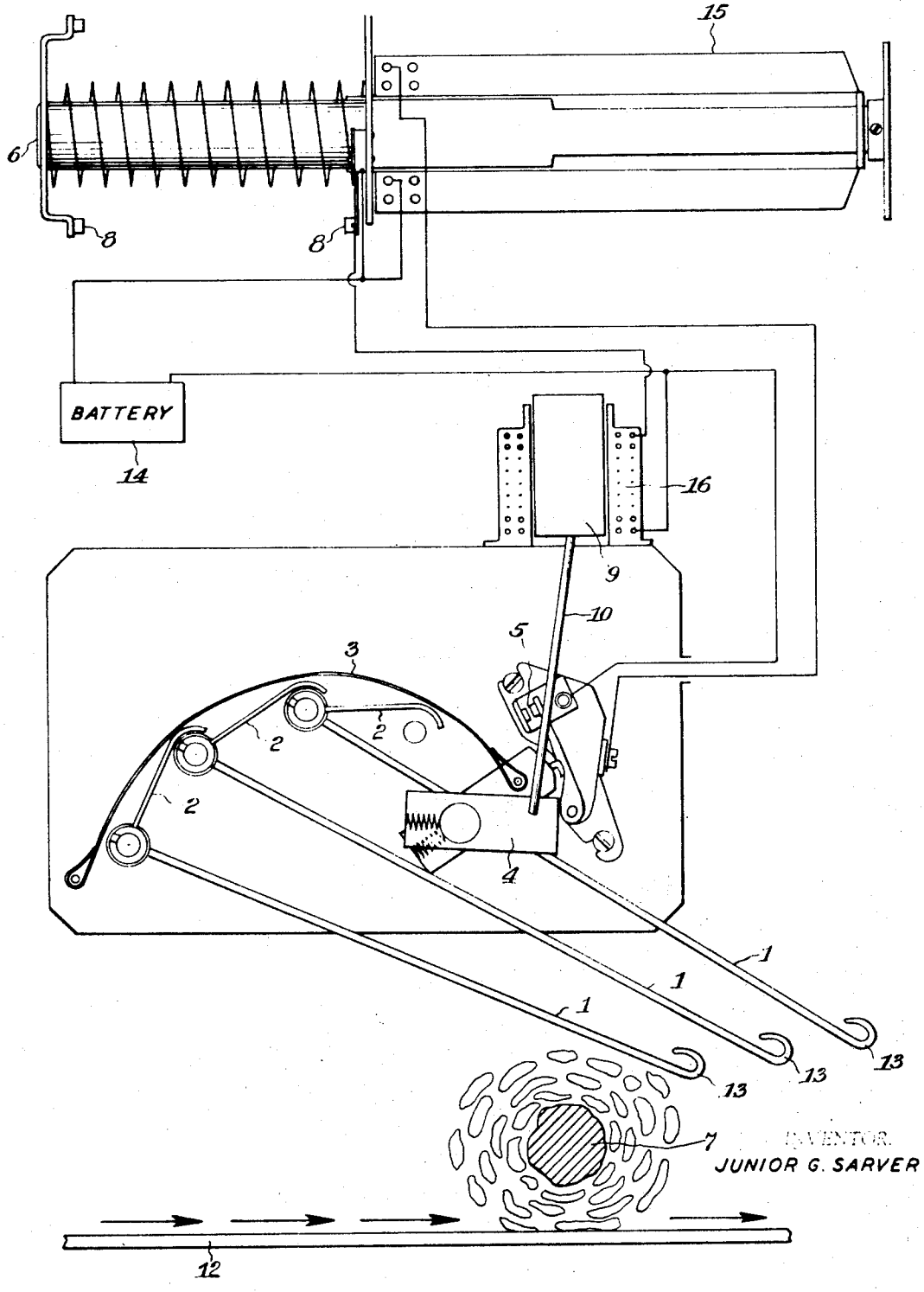
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APPARATUS FOR SORTING IRREGULARLY SHAPED ITEMS

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APPARATUS FOR SORTING IRREGULARLY SHAPED ITEMS

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ABSTRACT OF THE DISCLOSURE

Apparatus for sorting various irregular objects according to size, in particular articles marketed in bunches, bundles, stalks, etc. or in containers where a certain number of bunches, bundles, or stalks having a specified size are required. The grading or sizing of vegetables into standard market sizes for packing into crates or other containers is the primary application. The size determining factor being the girth at some point or several points with irregular shapes, i.e. flat, square, round, triangle, open center, separated stems, etc. making actual size difficult to determine.

Summary of the invention

Apparatus for sorting irregularly shaped items or objects of the character indicated to pass those items which attain or exceed a predetermined size into a container. The apparatus is associated with other equipment whereby the items are automatically moved one after the other in sequence to said apparatus.

The apparatus includes a plurality of separated item size sensing members which are physically displaced from original or rest positions when the item sensed equals or exceeds said size. First means responsive to the physical displacement of said members shifts from a normal first position to a second shifted position, the first means returning the members to their original positions when itself returned from the second position to the first position.

A first set of contacts is under the control of the first means, being open when the first means is in its normal position and being closed when the first means is in the shifted position.

Second means, including a first solenoid having a spring loaded plunger and connected in electrical circuit with the first set of contacts, causes said plunger to be extended and to push the item sensed into the container when the first set is closed. Said plunger is automatically withdrawn when the first set is open.

A second set of contacts is controlled by the plunger of the first solenoid, the second set being open when the plunger is withdrawn and being closed when the plunger is fully extended.

Third means, including a second solenoid having an arm coupled to the first means is connected in electrical circuit with the second set of contacts. The arm moves the first means into its normal position when the second set is closed and permits the first means to be shifted into the second position when the second set is opened.

Thus, the items which do not attain desired size are moved past the apparatus whereas the items which either attain or exceed this size are sequentially collected in the container.

Brief description of the drawing

The accompanying figure illustrates my apparatus.

Detailed description of preferred embodiment

Referring now to the figure, a conveyor **12** causes stalks **7** to pass under the sensing heads **13**, each of which is secured to a corresponding end of a corresponding one

of three levers **1** and which contact the stalk in three places, being adjusted and spaced to give the most advantageous indication of its size in relation to its shape and irregularities. This movement is transmitted to three cams **2** each of which is secured to a corresponding other end of a corresponding one of levers **1**, these cams **2**, which cooperate with each other, each in turn contact a flexible non-elastic member **3** causing the upward movement of the three levers **1**, less any downward movement, to be integrated into a movement of the cam **4** which when moved to a certain position allows a set of contacts **5** to close making an electrical circuit with battery **14** which causes the plunger **6** of the kickoff solenoid **15** to strike the stalk **7** and cause it to move from its position into an accumulating container. As the plunger **6** reaches the forward position a set of contacts **8** close making an electrical circuit which pulls the plunger **9** of another solenoid **16** downward causing the pushrod **1** to return the cam **4** to its original position which in turn opens the contacts **5** and allows the plunger **6** to be retracted by the spring **11**. The purpose of this pushrod **1** and plunger **9** assembly is to prevent the kickoff plunger **6** from making partial strokes when stalks of borderline size pass under the levers, and also to cause the kickoff plunger **6** to make rapid repeating strokes if for some reason the stalk does not move properly.

In addition to the above it should be noted that the solenoids may also be incorporated into or used to actuate an air or hydraulic valve assembly where a greater amount of movement is needed and the use of cylinders or diaphragms powered by air or hydraulic pressure is indicated.

It should also be noted that an additional cam or cams can be installed and connected by suitable linkage to a weight determining device for example which will integrate this factor into the size total. Also that an electrical switch controlled by a weight determining device can be incorporated into the electric circuit in a way to permit minimum or maximum weight factors to be included in the sizing operation.

In practice these devices are used in a series of there or more units each set progressively to a smaller size or grade.

While I have described my invention with particular reference to the drawings, my protection is to be limited only by the terms of the claims which follow.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. Apparatus for sorting irregular shaped items to pass those of said items which attain or exceed a predetermined size into a container, said items being automatically moved one after the other in sequence to said apparatus, said apparatus comprising:

a plurality of physically separated item size sensing members which are physically displaced from original positions when the item sensed attains or exceeds said predetermined size;

first means responsive to said physical displacement to shift from a normal first position to a second shifted position, said first means returning said members to their original positions when itself returned from the second position to the first position;

a first set of electrical contacts under the control of the first means, said first set being open when the first means is in the normal position and being closed when the first means is in the shifted position;

second means including a first solenoid having a spring loaded plunger and connected in electric circuit with the first set of contacts, said plunger being extended to push the item sensed into said container when the first set of contacts is closed, said plunger being

automatically withdrawn when the first set of contacts is open;

a second set of contacts under the control of the plunger of the first solenoid, said second set being open when the plunger is withdrawn and being closed when the plunger is fully extended; and

third means including a second solenoid having an arm coupled to said first means and connected in electric circuit with said second set of contacts, said arm moving said first means into its normal position when said second set is closed and permitting said first means to be shifted into the second position when the second set is open.

2. Apparatus as set forth in claim **1** wherein each of said members is elongated and is provided at one end with a sensing head, said apparatus further including a like plurality of cams, each cam being secured to the other end of a corresponding member, said first means being responsive to movement of all of said cams to integrate same to shift in position.

3. Apparatus as set forth in claim **2** wherein said cams are coupled together.

4. Apparatus as set forth in claim **3** wherein said third means includes another cam controlled by the arm of the second plunger.

5. Apparatus as set forth in claim **4** wherein said first means includes a flexible non elastic elongated member.

References Cited

UNITED STATES PATENTS

1,712,700	5/1929	Handenbergh	209—90
1,872,889	8/1932	Champlin et al.	209—90
3,327,848	6/1967	Barnhart et al.	209—90 X

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209—75, 80, 90