July 3, 1934. W. H. BUTTERWORTH 1,964,905

GRAB FOR VENDING MACHINES

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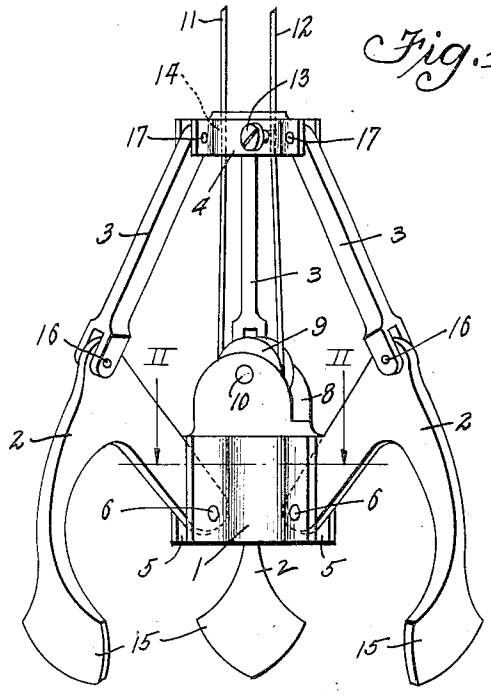
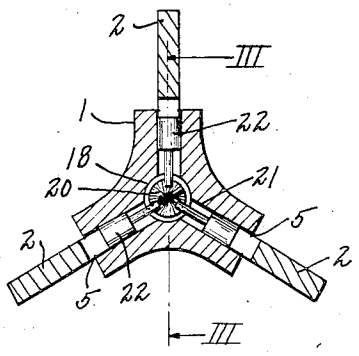


Fig. 1.

Fig. 2.



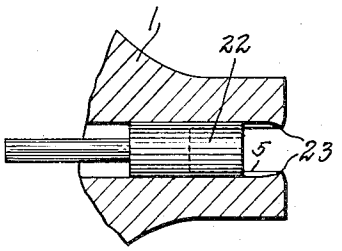


Fig. 4.

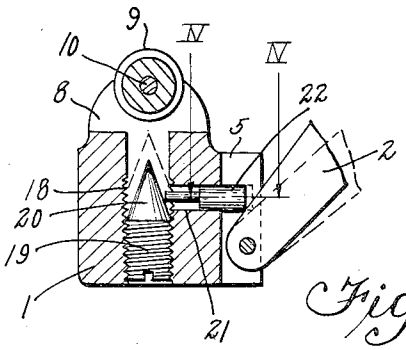


Fig. 3.

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GRAB FOR VENDING MACHINES

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4 Claims. (Cl. 294—112)

This invention relates to miniature automatic grabs of the type used in vending machines, in which articles arranged upon a display platform are selected, picked-up, and delivered to a delivery chute by the grab, manipulated under the control of the person operating the machine.

A complete machine of this type is disclosed in the copending application of John Franklin Meyer and Carl R. Simpkins, Serial No. 699,014, filed November 21, 1933.

As previously constructed, grabs of the type to which this invention relates comprise a plurality of claws or jaws hinged to swing from an open to a closed or seizing position, and suspended from a pair of cables through a mechanism which functions to close the jaws when the weight of the grab is supported by one of the cables, and opens the jaws when the weight of the grab is transferred to the other cable.

To the best of my knowledge, grabs of this type, as previously constructed, had only one position of maximum opening. It is advantageous, however, to be able to vary the maximum opening positions of the jaws to limit the number of articles that can be picked up in one operation, or, to make it more difficult to seize a single object of given size. Furthermore, it is desirable that the amount of opening movement be easily adjusted because the proprietor of the machine may wish to vend articles of different dimensions from time to time.

A particular object of the present invention is to provide a grab construction in which the maximum opening of the jaws may be easily and quickly varied, and the structure for accomplishing this result will be explained with reference to the accompanying drawing, in which

Figure 1 is an elevational view of a complete grab, in accordance with the invention.

Fig. 2 is a horizontal section in the plane II—II of Fig. 1.

Fig. 3 is a detail vertical section taken in the plane III—III of Fig. 2, showing the adjustable mechanism for limiting the maximum opening position of the jaws.

Fig. 4 is a detail horizontal cross-section showing the mounting of the stop members for limiting opening movement of the jaws.

Referring to the drawing, my grab comprises as its essential elements a central frame member 1 to which are hinged a plurality (three in this instance) of jaws 2, which jaws are connected by links 3 to a common control member 4 positioned above the frame member 1.

The frame member 1 is provided with radially extending slots 5 in which the inner ends of the jaws 2 are pivotally secured by pivot pins 6 passing through the inner ends of the jaws. The grooves 5 serve to guide the jaws 2 thereby reducing the strain on the pivot pin 6 and aiding in maintaining the jaws in proper alignment. The upper end of the body member 1 is rounded and is provided with a central slot 8 in which a pulley 9 is pivotally mounted on a pin 10. The cable 11, for closing the grab, passes down through a guideway 14 provided therefor in the control member 4, thence under the pulley 9 and back up to the control member 4 to which it is anchored by a setscrew 13. The opening cable 12 is anchored to the control member 4 and in this instance comprises merely an extension of the control cable 11 which is extended above the setscrew 13.

Each jaw 2 is preferably provided with a shovel-shaped tip 15 which is curved inwardly. As clearly shown in Fig. 1, each jaw is of substantially L-shape and has its associated link 3 pivotally connected to the elbow portion of the jaw by a pivot pin 16. The upper end of each link 3 is secured to the control member 4 by a pivot pin 17.

If the device as described is supported from the cable 12 and the cable 11 is slack, it assumes the position show in Fig. 1 in which the weight of the frame member 1 and of the jaws 2 is suspended from the control member 4 through the links 3. The weight of the frame member 1 causes the device to assume the open position shown in which the tips 15 of the jaws 2 are separated, the spacing between the tips 15 depending upon the degree of opening of the jaws 2. In accordance with the present invention, the opening of the jaws is adjustably limited by the mechanism shown in detail in Fig. 3.

Referring to Fig. 3, it will be observed that the frame member 1 is provided with a central vertically threaded aperture 18 in which is mounted a screw 19 having a tapered upper end 20, the screw being inserted from the bottom side of the frame member 1. Extending horizontally and radially from the aperture 18 are three apertures 21, each aligned with one of the slots 5 in which the jaws 2 are mounted, the recesses being extended inwardly from the bottoms of the grooves or slots 5. Slidably mounted in each aperture 21 is a stop member 22 which projects beyond the aperture into the groove in which the associated jaw 2 is mounted, so that as each jaw moves upwardly into the position shown in Fig. 1 it abuts against its associated stop member 22 and forces

the latter inwardly until it contacts with the tapered end of the screw 19.

It will be readily apparent that by turning the screw 19 in or out to vertically shift the tapered end 20, the inward movement of the stop member 22 may be limited in varying degree. Each stop member 22 is prevented from escaping outwardly beyond the mouth of its associated groove 5 by slightly peening over the lips of each of the grooves as shown at 23 in Fig. 4.

In practice the grab is operated by lowering it while suspended from the cable 12 into contact with the object or objects to be picked-up and then releasing the tension on the cable 12 and lifting upwardly on the cable 11. Tensioning of the cable 11 applies lifting force directly through the frame member 1 to the pulley 9 and at the same time pulls the control member 4 downwardly, thereby shifting the jaws 4 toward closed position in which the shovel tips 15 of the jaws approach each other. If the object to be picked-up does not lodge between the jaws, this closing movement continues until the tips 15 intersect and thereafter further lifting force on the cable 11 lifts the entire device into the air. If the object picked up lodges between the tips of the jaws 2 the latter will be prevented from completely closing, but they will clamp onto the article with a substantial force because of the fact that the tension on the cord 11, which is a function of the entire weight of the device, tends to close the jaws. After being seized an article may be transported to a desired point in the grab by continuing to support the latter from the cable 11 and the grab may be opened to release the object at a desired point by tightening the cable 12 and releasing the tension on the cable 11.

While I have illustrated and described the preferred embodiment of my invention, I do not desire to be limited to any of the details of construction shown or described herein, except as defined in the appended claims.

I claim:

1. A grab of the type disclosed, comprising a central frame member, a plurality of jaws all hinged to said member whereby they swing from a closed position below said member outwardly and upwardly into an open position, means for opening and closing said jaws, an adjustable abutment for each jaw to limit the maximum opening of that jaw, and a single adjusting member cooperating with said abutments for simultaneously shifting said several abutments to vary the position of maximum opening of said several jaws.

2. A grab of the type disclosed, comprising a central frame member, a plurality of jaws hinged to said member whereby they are free to swing from a closed position below said member outwardly and upwardly with respect to said member, means for opening and closing said jaws, an adjustable abutment for each jaw to limit the position of maximum opening of that jaw, said abutments being supported in said member for radial movement with respect to the vertical axis of said member and adapted to contact their associated jaws at their outer ends, and a vertically movable tapered adjusting member axially positioned in said member for contacting the inner ends of said abutments for variably displacing said abutments outwardly depending upon the vertical position of said adjusting member.

3. A grab of the type disclosed, comprising a central frame member, a plurality of jaws hinged to said member, whereby they are free to swing from a closed position below said member outwardly and upwardly with respect to said member, means for opening and closing said jaws, and stop means including a single vertically movable adjusting member within said body member for limiting the position of maximum opening of said several jaws.

4. A grab of the type disclosed, comprising a central frame member having a pulley secured to the upper end thereof for a supporting and controlling cable, a plurality of jaws hinged to said member whereby they swing in radial planes from closed positions below said member to open positions upwardly and outwardly displaced from their closed position, a jaw-control member positioned above said frame member and linked to said several jaws at points outwardly displaced from their hinge points, guide means in said control member for a control cable, a control cable secured at one end to said control member and extended therefrom down under said pulley and thence up through said guide means, a second control cable anchored to said control member, and means for adjustably limiting the maximum opening of said jaws, comprising a pin for each jaw radially slidably mounted in said frame member above the hinge point of the associated jaw, and a tapered screw member axially positioned in said body member and threaded therein from the bottom side, the tapered portion of said screw member being juxtaposed to, and adapted to contact with, the inner ends of said pins, whereby the radial positions of said pins may be varied by screwing said adjusting screw in or out.

WILLOUGHBY HARRISON BUTTERWORTH.