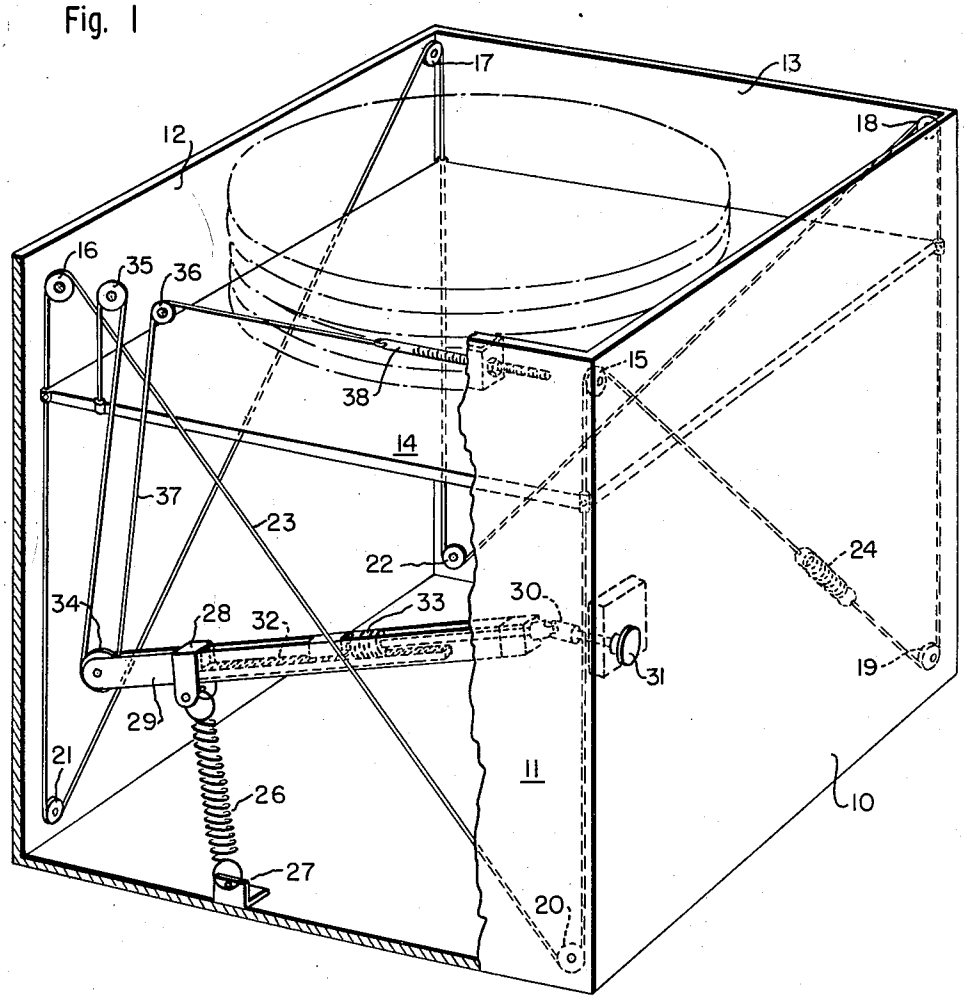
Dec. 29, 1959 H. L. SHIVEK 2,919,168

DISPENSER WITH SUSPENDED CARRIER

Filed Feb. 25, 1957

Fig. 1



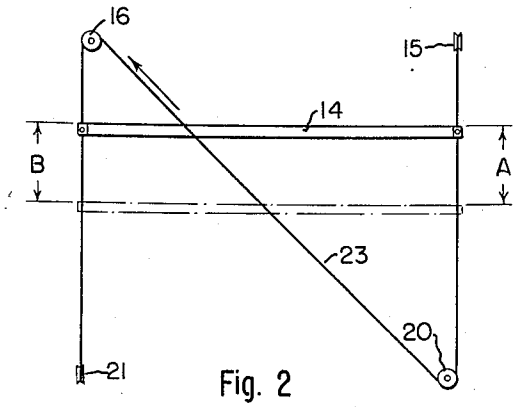


Fig. 2

INVENTOR.

Herbert L. Shivek.

BY

Hemway, Jenney, Witter & Hildreth

Attys.

United States Patent Office 2,919,168
Patented Dec. 29, 1959

2,919,168

DISPENSER WITH SUSPENDED CARRIER

Herbert L. Shivek, Brookline, Mass., assignor to Serv-O-Lift Corporation, Boston, Mass., a corporation of Massachusetts

Application February 25, 1957, Serial No. 642,116

5 Claims. (Cl. 312—71)

This invention comprises a new and improved dispenser for storing a varying load of trays, plates or other articles and automatically advancing the whole load to present one of such articles at a predetermined position for convenient removal.

The dispenser of this invention is characterized by a novel and simplified system of suspension for its carrier plate by the employment of which it is possible to do away with the elaborate sprocket chain mechanism required in dispensers heretofore widely used. In accordance with the present invention I employ a continuous cord or cable trained over a system of pulleys located above and below the carrier plate so as to span its whole range of travel, fastened to the plate between each pair of vertically arranged pulleys and with inclined or diagonal connecting portions that maintain the plate in level position throughout its travel. It has been found that in practice this suspension system maintains a carrier plate level in all positions thereof and regardless of the load.

The dispenser of this invention is further characterized by having elevating mechanism operatively connected to the carrier plate independently of the suspension system above outlined. The elevating mechanism includes an arm having at one end a hoisting connection with the carrier plate, a spring biasing the arm in a direction to lift the plate in combination with a worm and rack carried by the arm for adjusting the point of spring connection.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawings in which:

Fig. 1 is a view in perspective shown with parts of the casing broken away, and

Fig. 2 is a diagrammatic view of one section of the suspension system.

In the specific form herein shown the dispenser comprises a rectangular outer casing which includes a bottom and four upright wall panels **10**, **11**, **12** and **13**. The casing is shown as square in cross-section but may be of any desired shape. Within the casing a square platform or carrier plate **14** is mounted for free vertical movement.

The suspension system for the carrier plate includes a series of upper pulleys **15**, **16**, **17** and **18** mounted respectively near one upper corner of the panels **10**, **11**, **12** and **13**, and a series of lower pulleys **19**, **20**, **21** and **22** mounted respectively in the same panels and adjacent to the lower diametrically opposite corner from the corresponding upper pulley.

A continuous cable or cord **23**, including in its length a tension clamp or turnbuckle **24**, is trained over these pulleys and permanently fixed to the carrier plate **14** at each of its corners at a point below the upper pulleys of the system. The upper and lower pulleys limit the vertical travel of the carrier plate **14** and accordingly span its entire range of travel. One section of the system is shown in Fig. 2 from which it will be apparent that when the carrier plate **14** is depressed a distance A, the right

hand vertical section of the cord **23** will give up a length exactly equal to the distance B by which the left hand section of the cord moves downwardly. In other words, the length of the cord between any two consecutive points of attachment to the carrier plate **14** remains constant in all four panels of the casing. The function of the clamp **24** is that of maintaining the cord always in taut condition. It will be noted that the suspension system is complete and self-contained.

It will be seen that in passing over the upper pulley **16** and the lower pulley **21** the cord **23** is directed in a right angular path, that is to say, one diagonal portion of the cord moves in a path parallel to the panel **11** and this is connected to another diagonal portion moving in a path parallel to the panel **12**. The same change in direction occurs four times in the circuit of the casing.

The elevating mechanism which, as already noted, is entirely independent of the suspension system comprises a tension spring **26** secured at its lower end by a bracket to the bottom of the casing and at its upper end to an adjustable slide **28** movable longitudinally upon an arm **29**. The arm is supported for oscillation about a universal joint **30** located at its right hand end as seen in Fig. 1 and carried by the inner end of a short rod mounted in the panel **10** and provided with a hand wheel **31**. The arm **29** carries the inner member of the universal joint which terminates in a worm **33** meshing with a rack **32** slidable in the arm **29** and connected to the slide **28**. Accordingly, by rotating the hand wheel **31** the rack and the slide **28** may be moved toward or from the fulcrum of the arm **29** and the effect of the spring **26** thus increased or decreased.

At its free end the arm **29** carries a pulley **34** and this is movable as the arm **29** swings beneath a pair of pulleys **35** and **36** mounted adjacent to the upper edge of the panel **11** in spaced relation. A cord or cable **37**, fast at one end to the carrier plate **14**, passes upwardly over the pulley **35**, then downwardly and about the pulley **34**, and upwardly about the pulley **36**. From there it passes to an adjustable rod **38** to which its other end is fastened. The rod **38** is mounted in a bracket secured to the panel **11** and is threaded for convenient adjustment which, in cooperation with adjustment of the spring **26**, determines the path of the carrier plate **14**. It will be apparent that tension of the spring **26** is effective always to increase the length of the vertical loop in the cord **23** and thus to elevate the carrier plate.

Where loads to be handled are heavy I find it advisable to duplicate the spring assembly on the opposite side of the unit and thus improve the action of the platform assembly under those conditions.

Having thus disclosed my invention and described in detail a preferred embodiment thereof, I claim as new and desire to secure by Letters Patent:

1. A dispenser having an outer casing of upright walls forming a three-dimensional enclosure with a carrier plate movable therein, and a suspension system comprising a series of upper pulleys mounted in the upper portion of the walls, a series of lower pulleys mounted in the lower portion of the walls, and a cord leading continuously over said pulleys one after another and being fixed to the plate at a point above each of the lower pulleys and below each of the upper pulleys, the plane of the cord located on any one wall being perpendicular to the plane of the cord on either adjacent upright wall, together with enclosed elevating mechanism including a spring-actuated arm having a hoisting connection with the carrier plate independent of the suspension system.

2. A dispenser as described in claim 1 in which the carrier plate is substantially square and the cord is fixed thereto adjacent each of its corners.

3. A dispenser comprising an outer rectangular casing

having upright wall panels disposed at right angles to each other, a carrier plate vertically movable therein, upper and lower pulleys mounted in each panel at diagonally opposite corners, and a continuous cord running about said pulleys and fixed to each corner of the carrier plate, the plane of the cord located on any one wall panel being perpendicular to the plane of the cord located in either adjacent upright panel, together with elevating mechanism including a spring-actuated arm having a hoisting connection with the carrier plate independent of said cord.

4. A dispenser comprising an enclosure of upright panels disposed at right angles to each other, a carrier plate movable vertically therein in a limited path of travel, pulleys mounted in each panel at points above and below the range of carrier plate travel, and a cord trained over said pulleys and connected to the carrier plate at points below each of the pulleys which are located above the range of carrier travel and having diagonal connecting portions that cross each panel, the plane of the cord located on any one panel being perpendicular to the plane of the cord located in either adjacent upright panel, together with elevating mechanism including a spring and connections with the carrier plate independent of the connections of said cord therewith.

5. A dispenser comprising a rectangular enclosure of upright panels disposed at right angles to each other, a carrier plate movable vertically therein in a limited path of travel, upper and lower pulleys mounted on each of the panels at points spanning the range of carrier plate travel, and a cord having a portion leading in a substantially vertical direction from each of the upper pulleys and another portion extending at an angle of about 45° to the next lower pulley, said vertical portions being connected to the carrier plate at points between each of said pairs of pulleys, whereby in the vertical movement of the plate, the length of cord given up below one point of connection is equal to the increase in cord length above an adjacent point of connection with the carrier plate, together with elevator mechanism including a spring-actuated arm having an adjustable hoisting connection with the carrier plate that is independent of the connections of said cord therewith.

References Cited in the file of this patent

UNITED STATES PATENTS

195,915	Bergner	Oct. 9, 1877
1,710,442	Warshaw	Apr. 23, 1929
2,601,295	Jensen	June 24, 1952
2,647,030	Fitz Patrick	July 28, 1953