Oct. 16, 1956 G. M. MAGRUM 2,766,973

CASE SHAKER

Filed Dec. 3, 1952

Fig. 1

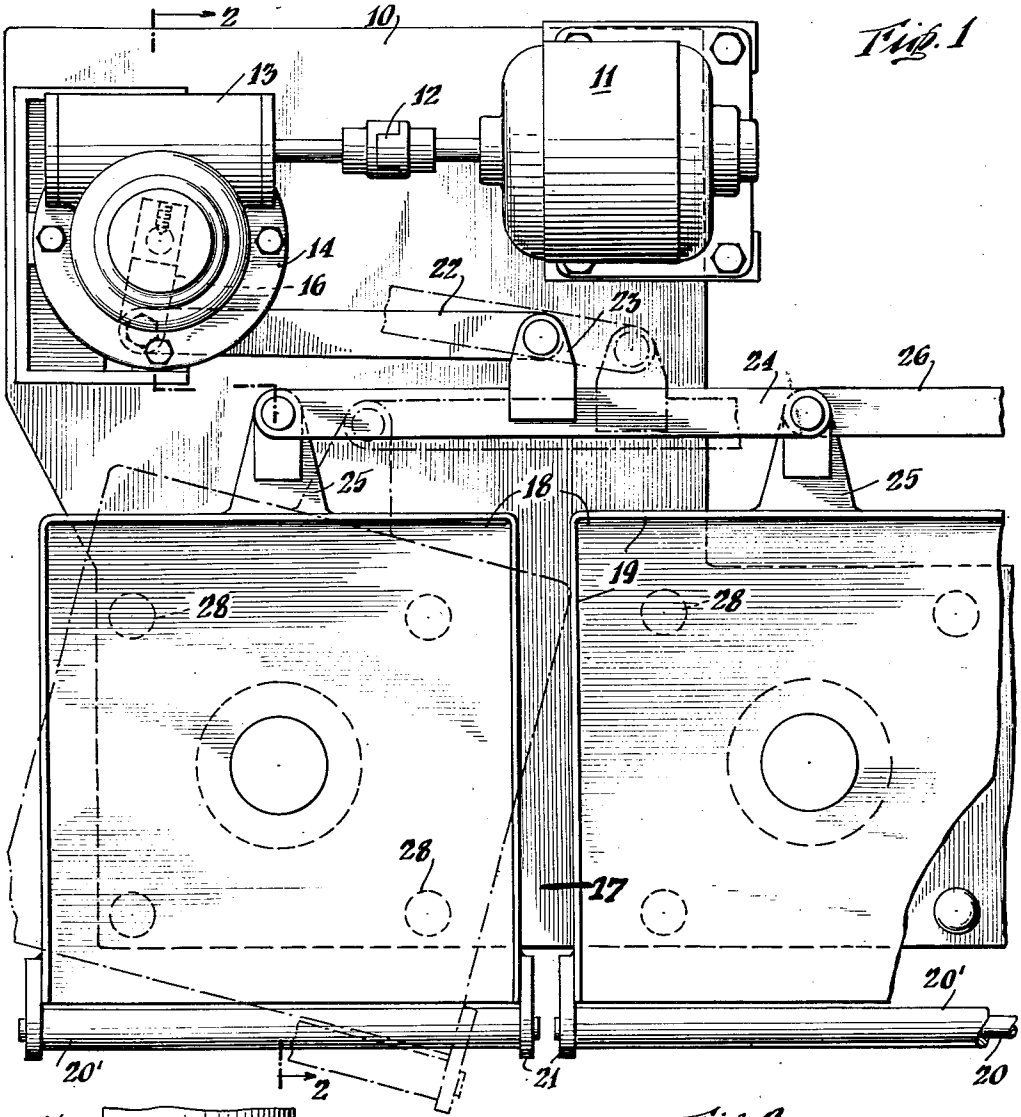
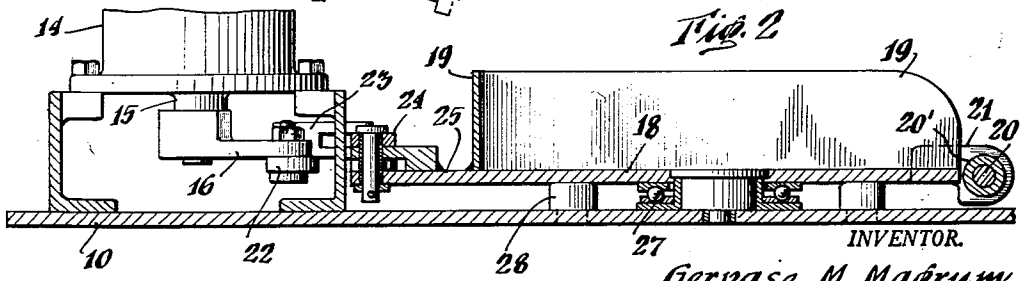


Fig. 2



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United States Patent Office 2,766,973 Patented Oct. 16, 1956

2,766,973

CASE SHAKER

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Application December 3, 1952, Serial No. 323,833

1 Claim. (Cl. 259—56)

This invention relates to a structurally and functionally improved shaker mechanism and in its specific aspects aims to provide an apparatus of the type ideally intended to receive and move cases or containers in a manner such that elements received therein are disposed evenly with a minimum of spacing between them. Also, these elements—where they are of a type having certain physical characteristics—will be disposed in generally parallel relationship.

Thus, by means of the present invention, a shaking apparatus is provided which will efficiently dispose elements which are being packaged in cases in a manner such that a maximum number of these elements will be arranged within a given space and will be readily available for subsequent distribution and use.

A further object is that of providing a mechanism of this character which will impart to a case associated with it, movements of a nature such that the desired results will be continuously and rapidly achieved.

Another object is that of furnishing a case shaker which will embody relatively few parts, each simple and rugged in construction and such parts being capable of ready assemblage to furnish a unitary mechanism operating over long periods of time with freedom from all difficulties.

With these and other objects in mind, reference is had to the attached sheet of drawings illustrating one practical embodiment of the invention and in which:

Fig. 1 is a fragmentary plan view of the apparatus with certain of the parts broken away to disclose underlying structures; and

Fig. 2 is a transverse sectional view taken along the line 2—2 and in the direction of the arrows as indicated in Fig. 1.

In these views, a base plate is shown which provides a mounting portion or area **10** to receive a driving motor **11**. The latter has its shaft connected through a coupling **12** with a speed reducer mechanism of any desired type disposed within casing portions **13** and **14**. Within these portions, the shaft **15** of the speed reducer extends as especially shown in Fig. 2. A crank **16** is secured to this shaft portion and rotates within casing **14**.

Disposed upon an area **17** of the mounting plate or base are any desired number of case holders. These have been indicated by the numeral **18** and are preferably rectangular. Each of them receives upon its surface a carton into which elements are discharged from a suitable delivery mechanism. Flanges **19** extend upwardly from preferably three side edges of each of the plates **18** so as to engage the outer faces of a carton disposed upon the plate. Accordingly, that carton will be prevented from being accidentally displaced in a direction in line with any of the flanges and will move with its supporting plate.

The carton may obviously be slid into position between the outer ends of the two end flanges and over that edge of the plate which is not provided with a flange. Extending in spaced relation with respect to and parallel to that plate edge is a roller **20'**. The latter is mounted upon a shaft **20** having its ends supported by brackets **21**.

Pairs of the latter are secured to the plates **18**. As especially shown in Fig. 2, the upper surface of the roller **20'** extends above the plane of plate **18**. Therefore, while this roller will serve to anti-frictionally support any carton as it is moved onto or away from the plate, it will additionally serve as a stop or detent to prevent an accidental displacement of the carton outwardly over that edge of the plate which is not provided with a flange **19**.

As shown, it is preferred to provide a number of carton-supporting plates **18** in a single machine. With this thought in mind, a connecting link **22** has one of its ends coupled to the end of crank **16**. Its opposite end is pivotally coupled to a bracket or arm **23** mounted upon a main connecting link **24**. A single link or member **24** may be employed or preferably separate links may be furnished in general alignment with each other. A second link has been shown at **26** in substantial alignment with link **24** to illustrate this. Arms **25** extend one from each of the plates **18** and are connected to the link structure **24—26**. As will be understood by employing a plurality of links, in effect an articulated bar is furnished in which the component parts are connected to the successive carton carriers if more than one of the latter is present.

With a view to supporting the plates **18** for rotation above the area **17** of the base, bearing assemblies **27** of any suitable type are interposed between these parts and mount the plates **18** adjacent their central portions. Thus, these plates may swing around their axes. Levelling plugs **28** may be mounted by the base plate and extend in bearing engagement with the under surfaces of plates **18**. Thus, the latter will incorporate proper lateral stability under all conditions of imposed load and movement.

In operation, it will be understood that a suitable receptacle (not shown) is preferably disposed upon each of the plates. In such positioning, the inner faces of the flanges **19** will bear against or lie immediately adjacent the outer faces of the receptacle or carton. As afore brought out, the cartons will be prevented from forward displacement by means of the rollers **19** which provide detents to achieve this result. With motor **11** operating, the reduction gearing or other mechanism will be caused to function to rotate crank **16**. Consequently, connecting link **22** will be reciprocated. Therefore, an approximately linear motion of the system of links which make up the articulated bar **24—26** will result. This motion is translated into oscillation of the case or carton holders. These receptacles are filled with elements such as washers, crown tops, disks, etc. Therefore with oscillating motion being transmitted to the cartons, it is also transmitted to the material or element as it falls into the carton. Such motion, together with the shock at the reversal of the stroke, disposes the elements or material evenly in the carton with a minimum of spacing between the same. Also, the elements are disposed (if they be of the type specified) in substantially parallel relationship. It will be additionally borne in mind that the velocity of motion is continuously variable because of the increase and decrease in acceleration of the connecting link **22** as it is actuated in one or the other direction by the circular motion of the lever or crank **16**.

It is, of course, apparent that desired results may be achieved in connection with various types of elements having different characteristics according to the speed of operation of the apparatus. Also, by varying the stroke, different results may be achieved. It is moreover apparent that according to the material which is being handled, the shaker can be operated continuously or intermittently in order to achieve the best results.

Thus, among others, the several objects of the invention as specifically afore noted are achieved; obviously numerous changes in construction and rearrangement of

the parts may be resorted to without departing from the spirit of the invention as defined by the claim.

I claim:

A shaker mechanism comprising a plurality of substantially rectangular plates, upwardly extending flanges on three sides of each of the plates, means supporting each of the plates for pivotal movement in a horizontal plane, a laterally extending arm on one side of each of the plates, a bar connecting the arms and pivotally joined thereto, a rotating crank, a link pivotally joined to the bar and the crank to provide the pivotal movement of the plates, and anti-friction means on the fourth side of each of the plates adapted to facilitate their loading and unloading,

said anti-friction means extending above the upper surface of each of the plates and adapted with the flanges to retain a receptacle on each of the plates during said pivotal movement.

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