Dec. 28, 1926. 1,612,444

W. D. KIMBALL ET AL

CARTON PACKING MACHINE

Filed July 7, 1922 2 Sheets-Sheet 1

Fig. 1.

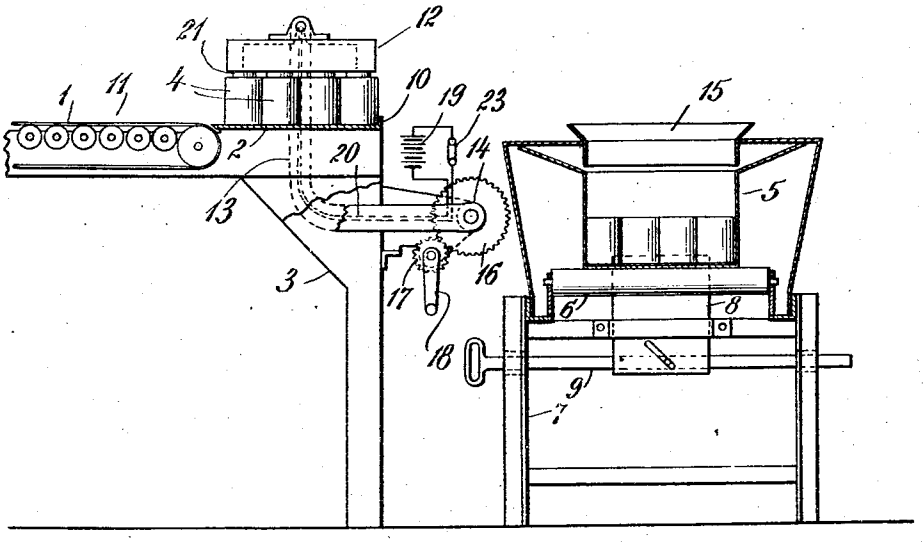


Fig. 2.

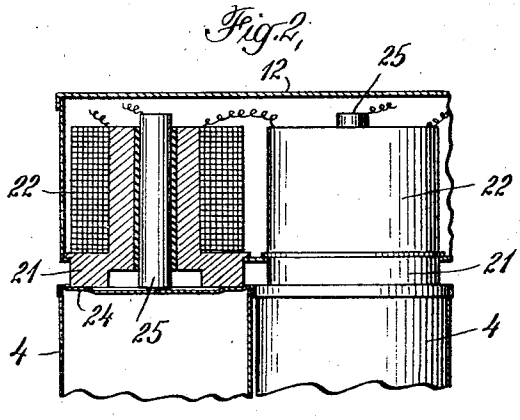
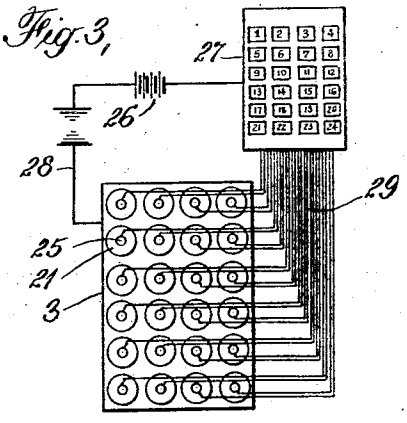


Fig. 3.



INVENTOR
Wallace D. Kimball
Arthur E. Hidout
BY Fredrick Fuchslinky
Ponnie, Davis, Marvin & Edmonds
ATTORNEY

Dec. 28, 1926. 1,612,444

W. D. KIMBALL ET AL

CARTON PACKING MACHINE

Filed July 7, 1922 2 Sheets-Sheet 2

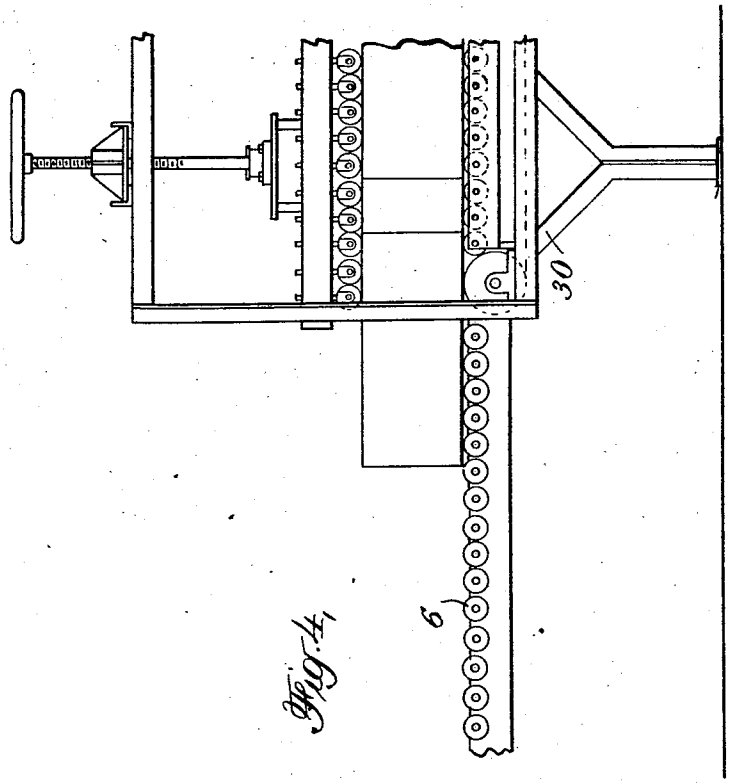


Fig. 4.

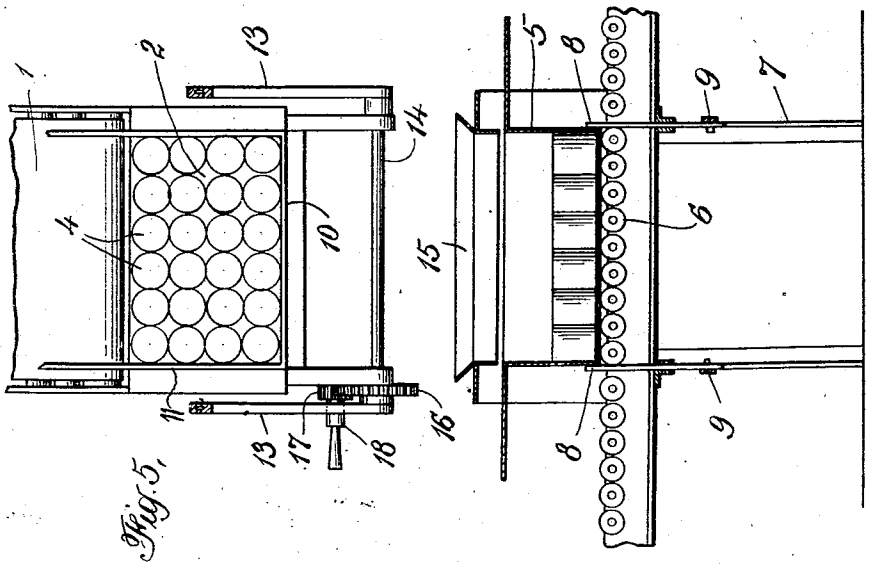


Fig. 5.

INVENTOR
William D. Kimball
Arthur C. Pickard
BY Frederick Kuehnle

Pennie, Davis, Marvin & Edmonds
ATTORNEY

Patented Dec. 28, 1926. 1,612,444

UNITED STATES PATENT OFFICE.

WALLACE D. KIMBALL AND ARTHUR E. RIDEOUT, OF NEW YORK, AND FREDERICK KUCKLINSKY, OF NYACK, NEW YORK, ASSIGNORS TO STANDARD SEALING EQUIPMENT CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

CARTON-PACKING MACHINE.

Application filed July 7, 1922. Serial No. 573,259.

The present application relates to apparatus used in the packing of canned goods, and the like, for shipment, and relates particularly to the packing and sealing of cartons made of fiber composition, or similar material.

Canned goods, such as fruits, vegetables, evaporated milk, and the like, are commonly put up in metallic containers, such as the so-called "tin-cans", for shipment and subsequent delivery to the consumer. The products are canned at the factory and the cans are shipped to points of distribution in boxes or cartons, the cans being arranged in tiers to fill the cartons. In the factory the cans are filled and sealed up ready for shipment, after which they are labelled and passed on in condition to be packed for shipment. After the labeling operation the cans are commonly placed on a traveling belt or other conveyer and are thus delivered to the packer who takes the individual cans off the belt and places each of them in the shipping carton. The filled cartons are then sealed for shipment, which operation is commonly accomplished by applying a cement or silicate to the carton flaps and subsequently pressing the flaps together until the silicate has set. The sealing operation may be accomplished by hand or, as is the prevalent practice in the larger shipping plants, by automatic machines which carry out all of the steps in the sealing process and deliver the cartons ready for shipment. Shipping cartons of this type are commonly of such size as to hold a considerable number of the smaller cans or articles which are contained in them. The time required to pack these cartons is thus appreciable and constitutes one of the most expensive operations in the entire process of putting the product into condition for transportation.

Cartons composed of a fiber composition have almost universally replaced wood boxes, or other more expensive containers. Such cartons form very durable containers if properly sealed, but some difficulty has been encountered in obtaining a proper sealing of the carton flaps and accordingly stitching the flaps together with wire has sometimes been resorted to. Cartons sealed in this manner are superior to those having improperly silicated flaps, but are far inferior to those in which the flaps are perfectly cemented together. The individual cans which contain the product being shipped consist of a body portion of sheet iron stamped out of thin material and subsequently shaped into the proper conformation. The iron body of the can is covered with a thin coating of tin or other metal or alloy to produce a surface of non-rusting character, and otherwise of qualities desirable for the purpose for which the cans are to be used.

It is a principal object of this invention to provide an apparatus for packing individual containers in shipping cases or cartons which apparatus may be operated by a single worker and by means of which the packing operation may be completed in a fraction of the time required when the operation is carried out by hand.

It is a further object to provide a carton packing apparatus of this type in which one entire tier of cans may be placed in the carton at a single operation, the apparatus being arranged to pick up the proper number of cans to complete a tier in the carton.

It is also an object to provide an apparatus of this type in which the packing operation is accomplished without jolting or otherwise handling the cans roughly, and in which the cans are handled in such manner that there is no likelihood of denting them or opening any of the seams so that leakage may occur.

It is a further object to provide a complete apparatus in which cartons may be packed as above described, and in which the filled cartons may be sealed and turned out ready for shipment, any or all of the packing and sealing operations being performed manually or by automatic means as desired.

It is a still further object to provide in a carton packing apparatus of the above type a lifting element arranged to pick up the individual cans selectively, those cans in which the contents have suffered a material fermentation or have otherwise been spoiled being usually rejected by the lifting device, and to further provide a means for indicating which of the cans are defective.

In carrying out our invention we commonly provide a table or similar flat surface to receive the cans as they come in closely grouped arrangement from the labelling process. Near this table is mounted a

lifting element intended to descend upon the group of cans resting on the table and pick up a sufficient number of them to constitute a tier in the carton to be packed. The lifting element is arranged to transport the cans into position above the carton to be filled and then to lower them into the carton and deposit them in place, after which the lifting element is returned to its initial position. This operation may be repeated in rapid succession, the movement of the lifting element being controlled manually or by automatic means, as desired. We employ in our invention a lifting element of any appropriate character, such as a suction means for holding the cans firmly in contact with the lifting element, a succession of pockets or fingers to surround and pick up the individual cans, and the like. We have found, however, that an electromagnetic lifting element is particularly applicable for the purpose, and we accordingly include this type of apparatus in the principal embodiment of our invention. Where desirable, we provide a system whereby a defective can will be noted and indicated, this system being preferably actuated by the action of the bulged end of a defective can in contacting with the lifting element. We also prefer to employ our improved packing apparatus in conjunction with a sealing machine for the filled cartons, but the packing apparatus may be used alone or in any other connection and still be within the scope of our invention.

We have illustrated a preferred embodiment of our invention in the accompanying drawings, in which Figure 1 is a vertical sectional view illustrating an apparatus embodying our invention; Fig. 2 is a sectional detail view showing one of the lifting elements; Fig. 3 is a diagrammatic view illustrating one feature of our invention; Fig. 4 is a vertical sectional view taken at right angles to Fig. 1 and illustrating a portion of our apparatus; and Fig. 5 is a partial plan view of the machine.

Sealed cans after being labeled and otherwise put in condition for shipment are delivered along a traveling belt or other conveyer 1 on to an appropriate receiving table 2. This table 2 may be supported at the desired height by a frame work 3 and serves as a support for the cans 4 which are about to be packed into the shipping cartons. We preferably support the carton 5 which is to be filled in a convenient position near the receiving table 2 so that the cans may be transferred from the table to the carton by traversing only a short distance. A roller table 6 may be mounted upon a frame work 7 to facilitate the positioning of the carton and to further facilitate the discharge of the filled carton after it has been packed. The empty carton may be pushed along the roller table 6 into the position shown in Fig. 1 and, for properly locating it in position to be filled, a pair of stops 8 arranged to protrude above the surface of the roller table 6 as shown may be provided. One of these stops 8 may be provided ahead of the carton so that the carton may be pushed up against it for proper location, whereupon the stop 8 at the rear of the carton may be elevated into the position shown to thus prevent the carton from being displaced along the roller table during the filling operation. The guides 8 are here shown actuated by the control lever 9, but it is evident that any desired actuating mechanism may be provided. Furthermore, side guides for preventing lateral displacement of the carton on the table during the filling operation may be provided in certain instances where desirable.

As the cans are delivered from the conveying belt 1 the operator may group them on the table 2 into some such position as shown in Fig. 1. A flange 10 may be arranged at the rear of the table to retain the cans and additional flanges 11 may be provided along the sides of the table, as best shown in Fig. 5, so that the cans may readily be grouped in parallel rows in the same manner as they will stand when packed in the carton. Positioned above the group of cans 4 is a lifting element 12 arranged to descend upon the group of cans and lift them off of the table 2. Various types of lifting elements may be employed, but we prefer to use an electromagnet for this purpose. The electromagnet 12, or other lifting member, is supported by an arm 13 having a pivotal connection with the frame of the apparatus at 14, which pivot point is located intermediate the table 2 and the support for the carton 5. By lowering the electromagnet into the position shown in Fig. 1, the magnetic attraction serves to retain the cans 4, and when the arm 13 is turned in a clockwise direction about its pivotal axis 14 the entire group of cans is lifted off the table 2 and transported in the direction of the carton 5. For the purpose of guiding the cans into the mouth of the carton a special entrance 15 is provided, which may be somewhat funnel shaped as shown so that the descending cans will automatically be centered in correct relation to the side walls of the carton. Turning of the lifting arm 3 may be effected manually or by power driven means, as desired, and we have here shown a gear 16 secured to the pivotal axis 14 and a pinion 17 with crank handle 18 to be turned by the operator to effect transportation of the cans from the supporting table to the carton.

The electromagnet 12 may simply be a continuous magnetic surface maintained in magnetized condition by suitable means, but due to slight irregularities which may occur

in the structure of the cans, and for other reasons, we prefer to constitute the lifting element of a plurality of electromagnets each of which is arranged to descend upon and attract a single can. The individual electromagnets may be actuated by any suitable source of direct current, such as a storage battery 19 having suitable leads 20 which may conveniently be carried by the supporting arm 13. The leads 20 serve to furnish current to the exciting windings of the individual magnets, which windings may be connected to the current source in the desired electrical arrangement. Referring to Fig. 2 each of the individual electromagnets consists of a portion 21 of magnetic material around which an exciting winding 22 is placed. Thus upon supplying current to the exciting winding, which may be done by means of a switch 23 provided at some convenient point in series with the actuating battery 19, the portion 21 of the electromagnet will be magnetized and will serve to attract a can and lift it when the supporting arm 13 for the magnets is turned about its pivot.

The contacting face of the magnetic portion 21 is arranged so that it will engage the raised portion or rim 24 of the can, and disposed centrally of the portion 21 is a brass rod or other member 25 of non-magnetic material which is above the central portion of the can. We have found that if a can is defective and fermentation of the contents results, the ends of the can invariably become bulged. When this occurs the non-magnetic portion 25 contacts with the bulged top of the can and prevents the portion 21 of the magnet from coming in contact with the edges of the can. The strength of the magnet is so regulated that unless actual contact between the can and magnetic portion 21 occurs, the can will not be lifted due to the fact that insufficient attractive force is exerted on it. Thus the apparatus will be effective to reject cans in which the contents have suffered a material amount of fermentation, such cans being left on the supporting table 2 and not transported to the carton.

Some difficulty may be encountered in that a can which is rejected by the lifting element may be slid along the surface of the supporting table and perhaps be pushed off onto the floor. For this reason it may in certain instances be desirable to provide some means whereby the operator may be informed as to which of the cans are defective before he actually begins to turn the supporting arm 13 and lift the cartons from the table 2. To this end we may provide a system similar to that illustrated in Fig. 3 which comprises essentially a source 26 of electrical energy associated with an indicating or enunciating mechanism 27 having appropriate circuits leading to the individual electromagnets. The individual elements of the annunciator 27 may consist of small glow lamps, buzzers, or other appropriate devices arranged or numbered in such manner that actuation of any one of the indicating devices will inform the operator as to which can is defective.

There is provided an electrical circuit associated with each can, which circuit may comprise the current source 26, one of the indicating elements 27, and the corresponding one of the individual electromagnets. The main lead 28 coming from one side of the battery 26 may, for instance, be grounded on to the frame 3 of the apparatus so that all of the cans 4 are maintained at ground potential inasmuch as they are in contact with the metallic supporting table 2 which is in turn in electrical connection with the frame 3. The various circuits 29 leading from the respective indicating elements 27 may be attached to the respective non-magnetic portions 25 of the individual electromagnets. Thus, in the ordinary course of operation when the can is lifted by the electromagnet and the member 25 does not come in contact with the can, the annunciator circuits will be open and none of the indicating elements 27 will be actuated. However, in case the top of the can is bulged contact will be made between the end of the can and the member 25, which contact will serve to complete the annunciator circuit corresponding to this particular can and will actuate the proper one of the indicating elements 27 accordingly. The operator will thus be informed as to a defective can and he may remove this can and substitute a sound one in its place.

In the operation of the machine the operator will group the cans 4 on to the table 2 in such arrangement as they will assume when packed in the carton. With the aid of the guide flanges provided on the table such arrangement of the cans may be effected by a single sweeping movement of the arm. The operator will then lower the electromagnetic lifting element 12 into the position shown in Fig. 1 and actuate the various electromagnets by throwing in the switch 23. The crank 18 is then turned with the result that the supporting arm 13 together with the electromagnet 12 and the group of cans 4 is transported to a position above the carton 5 with the cans projecting into the mouth of the carton. In this position the switch 23 may be opened whereupon the magnets will release the cans and permit them to drop into position in the carton. This operation may be accomplished in a short time and may be repeated indefinitely without undue effort on the part of the operator.

After the carton is filled it is pushed along the roller table 6, which table may conven-

iently lead to a carton sealing apparatus 30, preferably of the type illustrated in our copending application Serial No. 396,362, filed July 15, 1920. Sufficient space is left between the point where the carton is packed and the initial end of the sealing machine so that the operator may silicate the carton flaps and send the carton on into the pressing mechanism of the sealing machine 30.

We claim:

1. Apparatus of the class described, comprising a support for the carton, a support for the cans to be packed, a member for carrying a number of said cans comprising a plurality of magnetized elements for attracting and transporting the respective cans, and means associated with said individual magnetized elements positioned centrally of the respective elements to engage the end of a can which is materially bulged and thereby cause said can to be rejected.

2. Apparatus of the class described comprising a support for the carton, a support for the cans to be packed, a member for carrying a number of said cans comprising a plurality of electromagnets each of which magnets serve to attract and transport a can, said magnets engaging the cans on their protruding edges, a member of non-magnetic material associated with said magnets and disposed within the portion engaging the rim of said can, said non-magnetic member engaging with the top of a can if its end is bulged to thereby prevent contact between the magnet and the rim of the can and cause the can to be rejected by the lifting member.

3. Apparatus of the class described comprising a support for the carton, a support for the articles to be packed, a member for carrying a plurality of said articles, means for transporting said member to the carton comprising a pivoted supporting arm having its pivot point displaced from the support for said articles in the direction of movement of said articles whereby said carrying member is raised upon turning said arm about its pivot, said carrying member being so positioned that continued pivotal movement of said arm causes the articles to enter the mouth of the carton.

In testimony whereof I affix my signature.

WALLACE D. KIMBALL.

In testimony whereof I affix my signature.

ARTHUR E. RIDEOUT.

In testimony whereof I affix my signature.

FREDERICK KUCKLINSKY.