

Jan. 7, 1969

W. C. CHRISTINE ET AL

3,420,407

CUP DEPOSITER ASSEMBLY

Filed May 17, 1967

Sheet 1 of 2

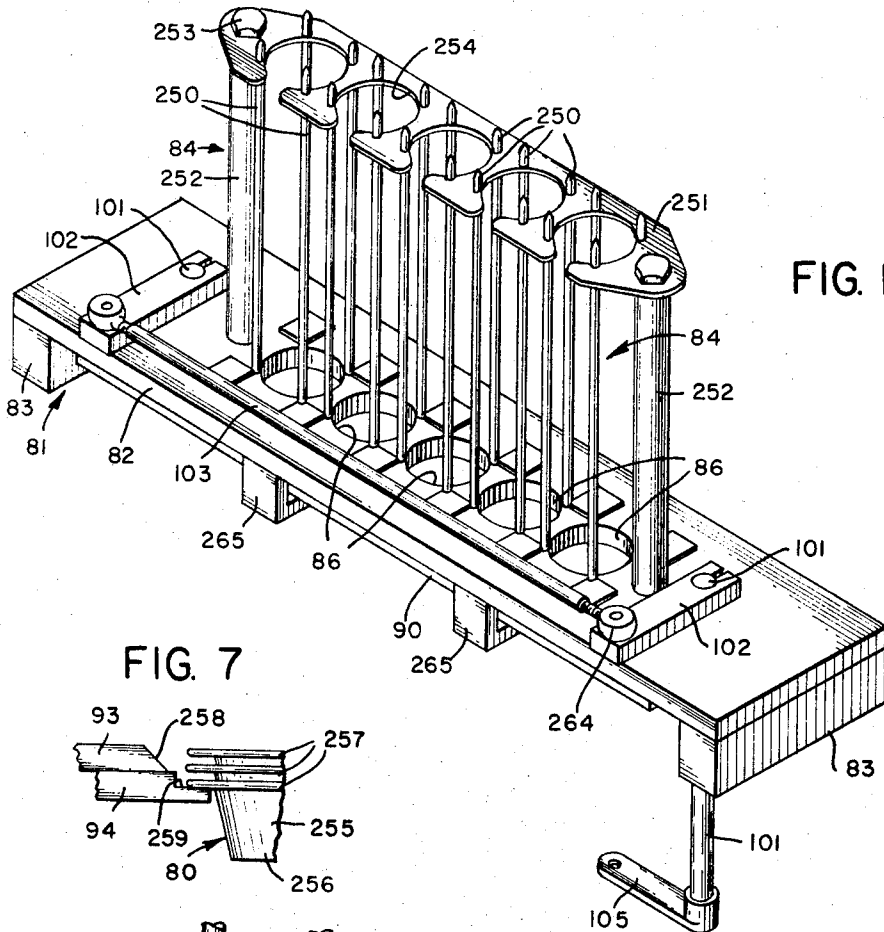


FIG. 1

FIG. 7

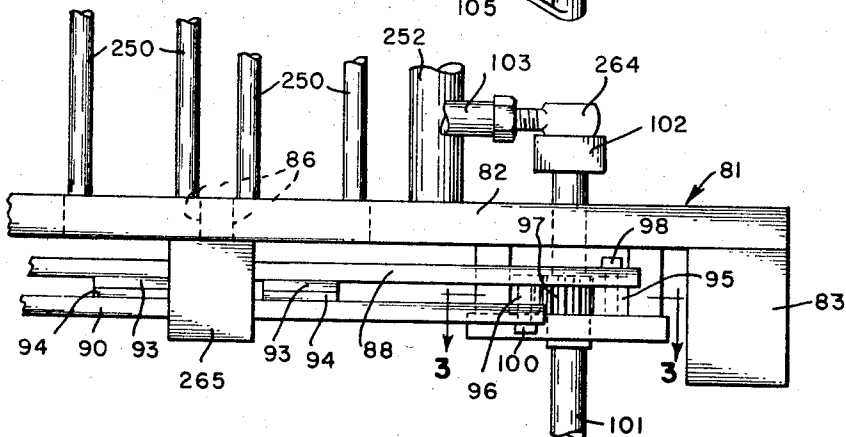
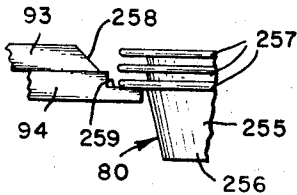


FIG. 2

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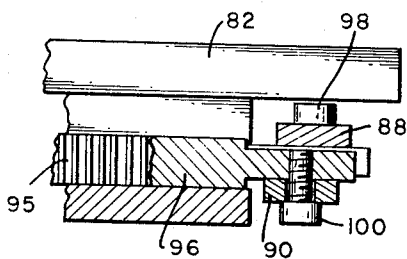
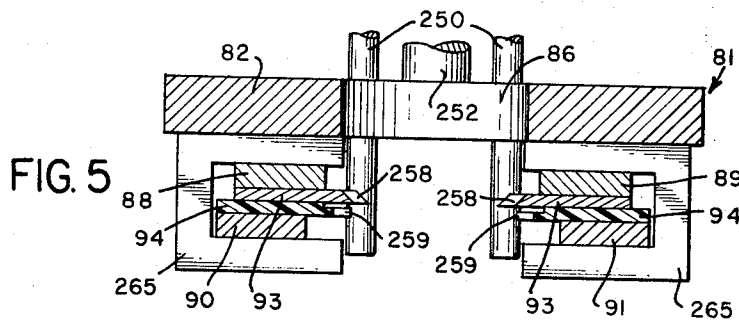
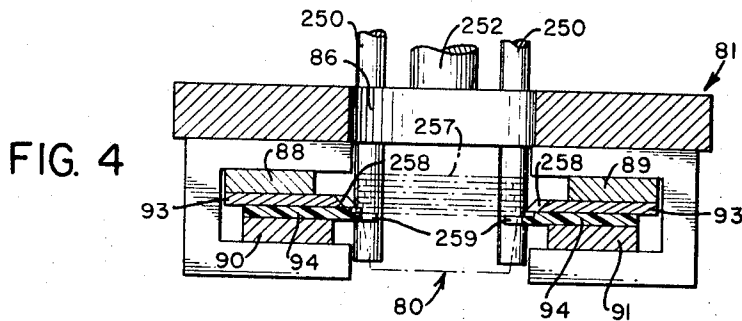
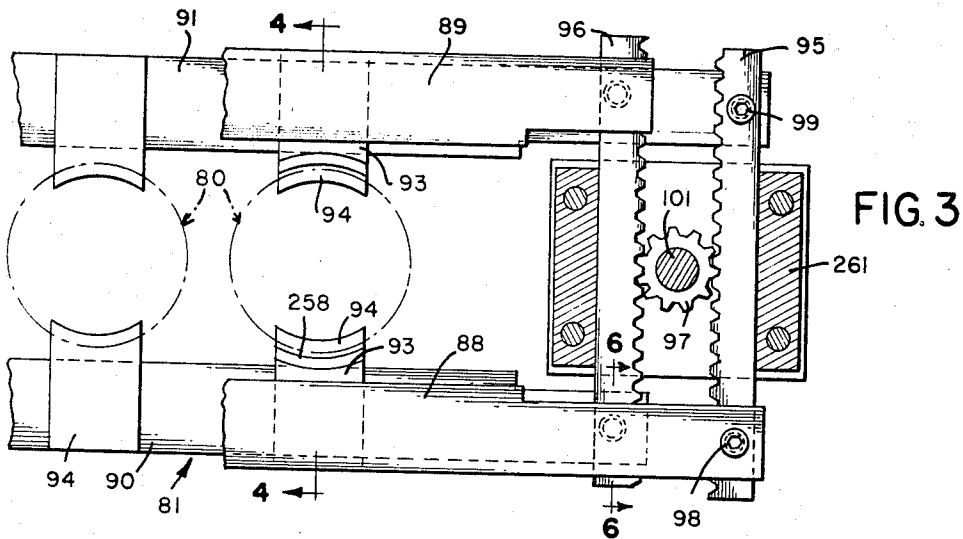
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Sheet 2 of 2



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3,420,407

CUP DEPOSITER ASSEMBLY

William C. Christine, Catasauqua, and Joseph E. Pierce, Allentown, Pa., assignors to Alien Electronics, Inc., Bethlehem, Pa., a corporation of Pennsylvania
Continuation-in-part of application Ser. No. 467,279, June 28, 1965. This application May 17, 1967, Ser. No. 639,073
U.S. Cl. 221-221
Int. Cl. B65h 3/28

2 Claims

ABSTRACT OF THE DISCLOSURE

A mechanism for depositing cups one at a time from a stack of cups, wherein the cups are adapted to be deposited or placed in openings in a moving conveyor of a packaging machine so that the cups can be subsequently filled with a material such as a powdered food product.

Cross-reference to related application

This application is a continuation-in-part of patent application Ser. No. 467,279 filed in the United States Patent Office on June 28, 1965.

An object of the present invention is to provide an improved mechanism for depositing cups from a vertical stack on to a desired location such as a moving conveyor, and wherein the cups are dropped or deposited individually from the stack, with the lowermost cup being deposited on to the desired location.

Further objects and advantages are to provide improved elements and arrangements in a device of the character described that is economical to produce, durable in form and conducive to the most economical use of materials.

Still further advantages will be apparent in the subsequent description in the specification.

In the drawings:

FIG. 1 is a perspective view of the cup depositer assembly of the present invention.

FIG. 2 is an enlarged fragmentary front elevational view thereof.

FIG. 3 is a sectional view taken on the line 3-3 of FIG. 2.

FIG. 4 is a sectional view taken on the line 4-4 of FIG. 3.

FIG. 5 is a sectional view generally similar to FIG. 4 but showing the parts in a different position.

FIG. 6 is a sectional view taken on the line 6-6 of FIG. 3.

FIG. 7 is a fragmentary elevational view illustrating certain constructional details of the present invention.

Referring in detail to the drawings, the numeral 81 indicates the cup depositer assembly of the present invention which may be used in conjunction with a packaging machine such as a packaging machine for filling and packaging cups 80 with dry powdered food products such as coffee, tea, soups and the like. The assembly 81 includes a horizontally disposed frame member or bar 82 which may be supported at its ends by blocks 83. The numeral 84 indicates each of a plurality of upstanding sleeves which are defined by vertically spaced rods 250, and the rods 250 may have their lower ends suitably secured to the frame member 82. The numeral 251 indicates a horizontally disposed top piece which is arranged in engagement with the upper portions of the rods 250, and there is further provided vertically disposed spaced parallel support members 252 which extend between the ends of the top piece 251 and the frame 82. The top piece 251 is provided with a plurality of spaced apart openings 254 therein. The numeral 253 indicates suitable securing elements or fasteners which are provided for

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maintaining the top piece 251 connected to the support members 252 as for example as shown in FIG. 1. The sleeves 84 are each adapted to hold a stack of superimposed cups 80, and each of the cups 80 are arranged in nesting relation to each other, and each cup 80 includes a generally cylindrical side portion 255, a bottom portion 256, an upwardly disposed circular flange or rim 257. The frame 82 has a plurality of openings 86 therein which are arranged in alignment with the sleeves 84.

In accordance with the present invention, there is provided a means for depositing or dropping one cup 80 at a time from the bottom of the stack of cups 80, and this means comprises a pair of horizontally disposed upper arms 88 and 89, and there is further provided a pair of spaced parallel horizontally disposed lower arms 90 and 91. A plurality of separator fingers 93 are mounted below each of the upper arms 88 and 89 and are suitably secured thereto in alignment with the openings 86 in the frame or bar 82. The ends of the separator fingers 93 are tapered or pointed as at 258 for a purpose to be later described.

There is further provided a plurality of holding fingers 94 which are suitably fastened to the upper portions of the lower arms 90 and 91, and the holding fingers 94 have curved end portions which are recessed so as to provided a cup depositer assembly which is especially below the separator fingers 93.

There is further provided a means for moving the arms 88 and 89, and 90 and 91, towards and away from each other, and this means comprises racks 95 and 96 which have teeth facing each other and a pinion 97 meshes with the teeth on the racks 95 and 96, FIG. 3.

There is further provided a means for rotating the pinions 97, and this means comprises a shaft 101 which has its upper end suitably affixed to one of the pinions 97 and shaft 101 is adapted to be rotated by a suitable mechanism through the medium of a linkage or the like 105. The numeral 102 indicates straps or bars which have a connector 103 extending therebetween and which is connected thereto as at 264. The numeral 265 indicates generally "C" shaped members which are arranged as shown in the drawings.

From the foregoing, it will be seen that there has been provided a cup depositer assembly which is especially suitable for use with a packaging machine, such as the packaging machine used for filling cups 80 with dry powdered food products. In use with the parts as shown in the drawings, a plurality of the cups 80 are adapted to be arranged in the sleeves 84 which are defined by the rods 250. Then, when it is desired to deposit cups one at a time from the stacks of cups 80 a suitable operating mechanism is used to actuate the shaft 101 as for example through the medium of a linkage or the like 105. As the shaft 101 is oscillated or rotated the pinion 97 which is fixedly mounted on the upper end of the shaft 101 will be turned, and because the pinion 97 meshes with inwardly directed teeth of the racks 95 and 96, it will be seen that this rotation of the pinion 97 will cause the pair of cooperating racks 95 and 96 to move relative to each other in opposite directions.

Inasmuch as the racks 95 and 96 are connected to the upper and lower arms 88, 89, 90 and 91, it will be seen that this movement of the racks will cause corresponding inward and outward movement of the arms 88 and 89 towards and away from each other. Due to the fact that the separator fingers 93 are affixed to the upper arms 88 and 89 and since the fingers 94 are affixed to the lower arms 90 and 91 it will be seen that at the proper time the separator fingers 93 will move towards and away from each other and simultaneously the fingers 94 will move toward and away from each other. This will thus assure that the tapered edges 258

of the fingers 93 will engage the cups 80 between the flanges 257 of the cups so as to separate the lowermost cups from the remaining cups in the stack. The lower finger 94 will move from beneath the lip 257 of the lowermost cup and permit the lowermost cup to fall by gravity to a suitable location such as an endless conveyor. The lower arms 90 and 91 are moved toward each other into their initial position, and the upper arms 80 and 89 and moved away from each other permitting the cups to fall by gravity until the flanges 257 of the cups engages the shoulder portion 259 of the holding fingers 94 so that the stack of cups will be supported in the desired manner.

It will be seen therefore that the present invention is a continuation in part of prior patent application Ser. No. 467,279 filed June 28, 1965. When the device is being used, a suitable mechanism is provided for moving the link 105 and this in turn rotates the shaft 101 whereby one of the pinions 97 thereon will be rotated, and since the pinion 97 meshes with the teeth of the racks 95 and 96, these racks will be moved. Arms 102 are connected to the shafts 101, and the pair of arms 102 are operatively connected together by means of a connector assembly 103 whereby the units on both ends of the assembly will be operated in unison. Fasteners 100 connect the arms 88 to the racks 95, FIGURE 6, and fasteners 99 connect the arms 89 and racks 95 together. And there is also provided fasteners or securing elements 98 as shown in the drawings. Spacer blocks 261 may be provided as shown in FIGURE 3 of the drawings. The members 265 function as guideways and supports for the arms that slide or move back and forth, for the previously described purpose.

While a preferred embodiment in accordance with the present invention has been illustrated and described, it is understood that various modifications may be resorted to without departing from the spirit and the scope of the appended claims.

What is claimed is:

1. A cup depositer for removing one cup at a time simultaneously from a plurality of closely spaced stacks of cups comprising a frame, a pair of spaced generally parallel upper arms and a pair of spaced generally parallel lower arms supported beneath said frame, each of said upper arms having a plurality of separator fingers, and each of said lower arms having a plurality of holding fingers, the separator fingers of said upper arms being in opposed relation to each other and the holding fingers of said lower arms being in opposed relation to each other, each pair of opposed holding fingers normally supporting a stack of cups, rack and pinion means located at each end of said arms, said rack and pinion means being interconnected for simultaneous movement to positively move said upper arms toward each other to separate one cup from each stack and temporarily

support said stacks and simultaneously move said lower arms away from each other to release the separated cups and thereafter positively move said lower arms toward each other and simultaneously move said upper arms away from each other to release said stacks which will fall by gravity onto said holding fingers.

2. A cup depositer for removing a cup from each of a plurality of closely spaced stacks of nested cups in which each cup has a flange, comprising a base, a frame for receiving a plurality of stacks of cups mounted on said base, a pair of spaced generally parallel upper arms located below said frame and a pair of spaced generally parallel lower arms disposed below said upper arms, said upper and lower arms being supported by said frame, multiple separator fingers carried by each of said upper arms, the separator fingers of one upper arm being in opposed relation with the fingers of the other upper arm, multiple holding fingers carried by each of said lower arms, each of said holding fingers being located below one of said separating fingers, a pair of rack means located at each end of said upper and lower arms, one rack means of each pair being connected to an upper arm at one side and a lower arm at the other side, the other rack means of each pair being connected to an upper arm at the other side and a lower arm at the one side, pinion means located between and meshing with the pair of rack means at each end of said arms, link means interconnecting said pinion means for simultaneously operating the same, shaft means mounting at least one of said pinion means, and means for oscillating said shaft means, whereby when said shaft means is operated in one direction said separator fingers will move toward each other to separate one cup from each stack and support said stack and said holding fingers will move away from each other to permit the separated cup of each stack to fall by gravity onto said base and when said shaft means is operated in the opposite direction said separator fingers will move away from each other to release said stacks and holding fingers will move toward each other to support said stacks.

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SAMUEL F. COLEMAN, *Primary Examiner.*

U.S. Cl. X.R.

221—275, 297

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,420,407

January 7, 1969

William C. Christine et al.

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

In the heading to the printed specification, lines 4 and 5, "assignors to Allen Electronics, Inc., Bethlehem, Pa., a corporation of Pennsylvania" should read -- assignors, by mesne assignments, to A.E.I. Corporation, Bethlehem, Pa. a corporation of Delaware --.

Signed and sealed this 10th day of March 1970.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

WILLIAM E. SCHUYLER, JR.

Commissioner of Patents