

April 15, 1969

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3,438,545

MEANS FOR DISPENSING SINGLE CONTAINERS FROM MULTIPLE
COLUMNS IN MULTIPLE MAGAZINES

Filed July 14, 1967

Sheet 1 of 2

FIG. 1.

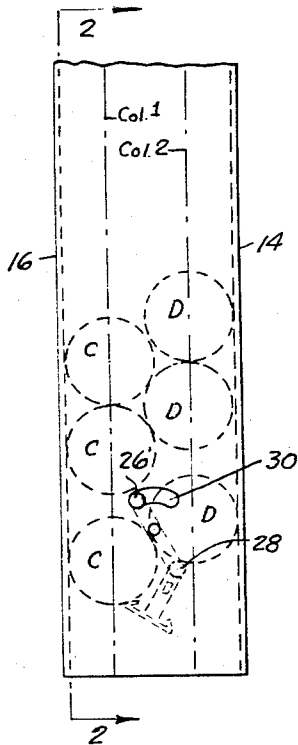


FIG. 2.

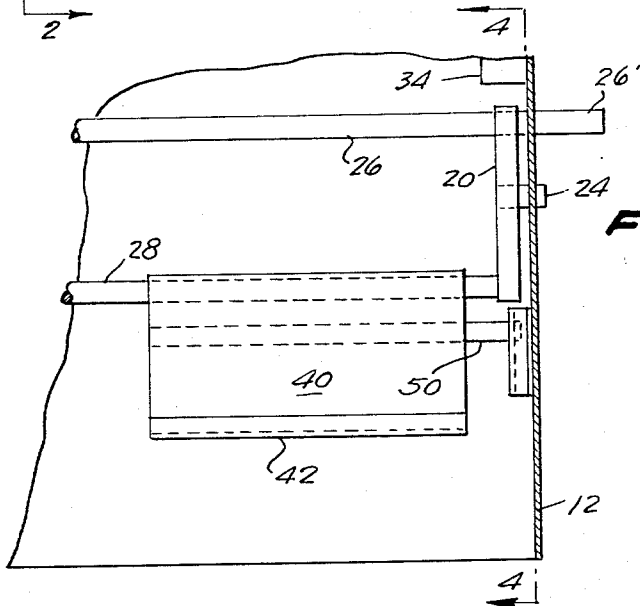
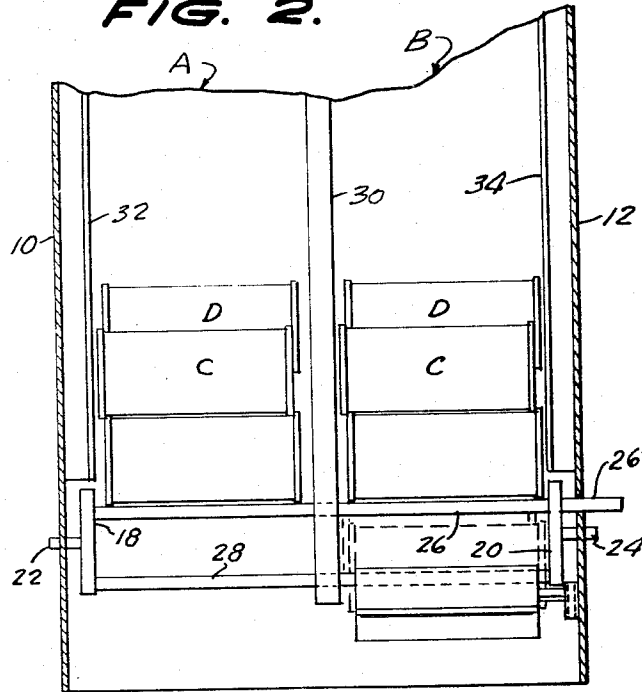


FIG. 3.

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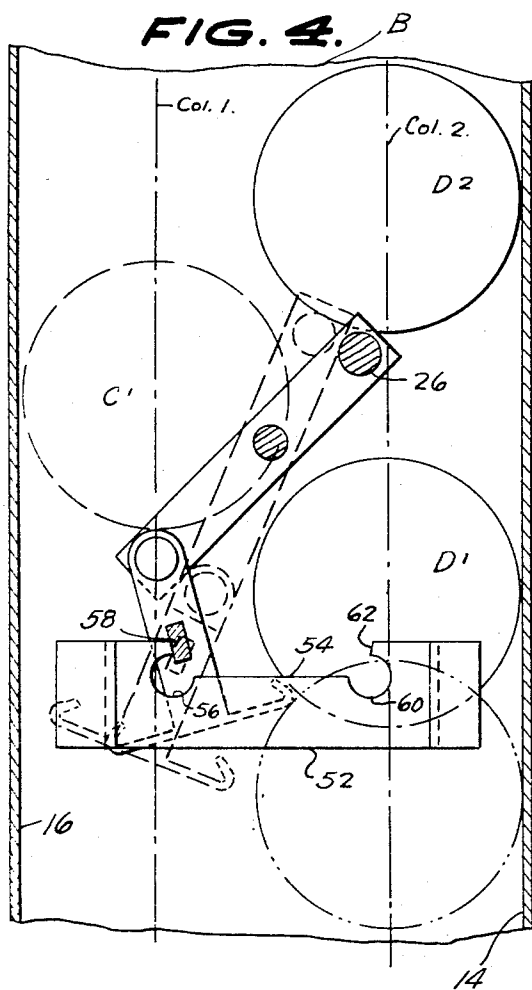


FIG. 4A.

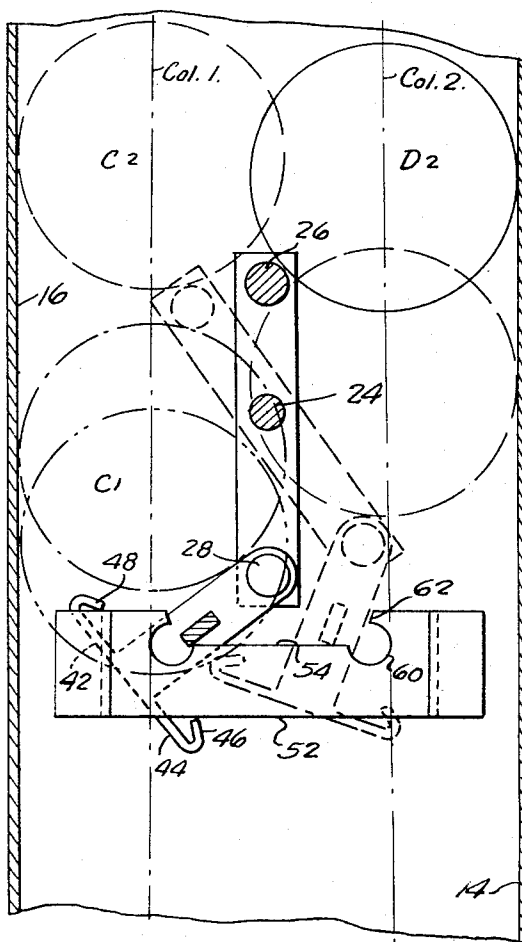
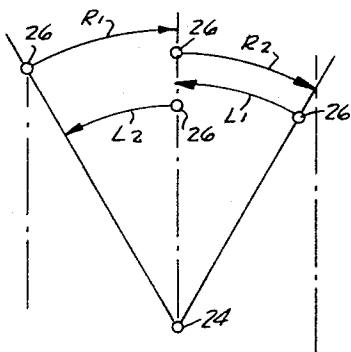


FIG. 5.



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MEANS FOR DISPENSING SINGLE CONTAINERS FROM MULTIPLE COLUMNS IN MULTIPLE MAGAZINES

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Filed July 14, 1967, Ser. No. 653,388

Int. Cl. B65g 1/08

U.S. Cl. 221-67

2 Claims

ABSTRACT OF THE DISCLOSURE

Means for dispensing containers from two vertical magazines, each magazine containing two columns of containers in corded relationship, said means comprising: a pair of rods, each extending axially of the containers across both of said magazines; a pair of levers, one at each end of said magazines, each of said levers being pivoted intermediate its length, said pivots being coaxial, one of said rods connecting one pair of free ends of said levers, and the other connecting the opposite free ends of said levers; a container retainer of inverted T cross-section pivoted to one of said rods and underlying only one of said magazines with the cross bar of the T downward; a detent bar projecting from one end of the leg of said T; a fixed cam coacting with said detent bar and operative to rock said T about the rod to which it is pivoted as said rod turns around the pivots of said levers.

This invention relates generally to means for dispensing more or less rigid containers of more or less circular cross-section from a pair of magazines each containing two columns of containers. The dispensing problem is to dispense from alternate columns in alternate magazines.

It is an object of this invention to provide a dispensing means as aforesaid, which will be of maximum adaptability and simplicity and of minimum cost.

It is a further object of this invention to provide a dispensing means as aforesaid, which, with minimum alteration, may be used either with cans or bottles and regardless, for all practical purposes, of the specific nature of the material of which the container may be formed.

The above and other objects will be made clear from the following detailed description taken in connection with the annexed drawings, in which:

FIGURE 1 is a front elevation of one of the magazines of my improved means with the operative motion of the dispenser for that magazine indicated in dotted outline;

FIGURE 2 is a section on the line 2-2 of FIGURE 1;

FIGURE 3 is an enlarged detailed view of the lower right-hand portion of FIGURE 2;

FIGURE 4 is a view similar to FIGURE 1, partially in cross-section and showing the parts in the position they occupy at the start of the cycle;

FIGURE 4A is similar to FIGURE 4, showing the parts in the position they occupy midway of the first-half of the cycle; and

FIGURE 5 is a diagram illustrating the various steps of the cycle.

"Cording" is very common because after all it is more efficient than strictly parallel separated columns. This will be obvious from FIGURE 1. It is moreover a task of the utmost simplicity to dispense containers from a corded column alternately from one column and then the next. When, however, two such columns or magazines are

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placed in what may be termed "tandem" relationship, as shown in FIGURE 2, the problem of dispensing alternate cans from the two columns within one magazine and to alternate such feeding from the two columns in the second magazine, it is considerably more complicated and the prior art utilizes a good many working parts to achieve this result. The present invention, however, does achieve this result with the utmost simplicity of mechanism and with no possibility of error. Moreover, a single such mechanism as disclosed herein will operate on either cans or bottles and within practicable limits due to the corded effect a single unit will handle a variety of can lengths and diameters or bottle lengths and diameters without need for modification or adjustment. A drive of the present mechanism specifically has been omitted since depending upon space limitations of the cabinet, an extremely wide variety of drives may be provided, any one of which might be patentable but any other one might be equally effective. For this reason, the present disclosure is concerned only with the parts directly operating on the containers in the two magazines.

As best shown in FIGURE 2, this invention contemplates a pair of magazines A and B, each of which is best shown in FIGURE 1, and each of which contains two columns C and D of cans and as shown in FIGURE 1, these are in corded relationship within the magazine. For simplicity of illustration cans are shown in the drawings and will be referred to throughout the specification. However, bottles equally well may be used. The cans or bottles are not necessarily rigid since today the use of polyethylene and the silicones will produce containers either of the straight cylindrical can type or the necked bottle type which will not technically be rigid but which when filled certainly respond perfectly to the term rigid container as contemplated herein.

As shown in FIGURE 2, the machine has vertical end walls 10 and 12 and vertical side walls 14 and 16. A pair of levers 18 and 20 have fixed aligned pivots 22 and 24 penetrating the walls 10 and 12, respectively. Above and below the pivots 22 and 24, levers 18 and 20 carry a pair of rods 26 and 28 which connect the levers 18 and 20 and underlie both the magazines A and B.

So far as the action of rods 26 and 28 is concerned, the action is precisely the same in both magazines A and B and occurs simultaneously in magazines A and B. The levers 18 and 20 with the rods 26 and 28 and the pivots 22 and 24 constitute a purely conventional means for discharging corded containers from any single magazine. This will best be understood by reference to FIGURE 1, in which in the position shown, rod 26 has released a can from column 2 of magazine B and the rod 28 which has just released a can from column 1, is retaining the can just dropped to it from column 2 of magazine B. When lever 18 is rotated about the pivot 22 to its opposite arcuate position, rod 28 will catch and restrain a can in column 1 of magazine B, while releasing a can in column 2 of magazine B. Such movement releases the next can in column 1 which, as noted, is caught and retained by the rod 28. The return operation, of course, repeats the entire cycle.

The operations just described take place simultaneously in magazines A and B so that except for the interposition of the mechanism to be described, each magazine would deposit two containers on each full oscillation of the levers 18 and 20 about the pivots 22 and 24 and would drop these alternately from columns 1 and 2 in each magazine. The

objective of dropping only one bottle per operation is accomplished by the very simple addition of parts shown in the lower right portion of FIGURE 2, shown again in an enlargement in FIGURE 3 and shown in enlarged view in FIGURES 4 and 4A which are taken on the line 4—4 of FIGURE 3.

Beneath magazine B, the rod 28 carries pivotally suspended a member 40. Member 40 is T-shaped and has at its free end cross members 42 and 44 terminating respectively in hook-shaped portions 46 and 48. Roughly midway of member 40 is a detent 50 preferably rectangular in cross section and having one end projecting outwardly from the member 40, as best shown in FIGURE 3. The detent 50 engages a fixed cam member 52 secured to the end wall 12. The active portions of cam member 52 comprise a central flat portion 54 which extends into columns 1 and 2 of magazine B but to an extent of less than half the diameter of the cans in each column. At the left-hand ends of FIGURES 4 and 4A, the flat portion 54 intersects a circular cut-out 56 which with the top end of the cam member 52 defines a limiting face 58 which by engagement with the detent 50, as shown in FIGURE 4, acts to pivot member 40 counterclockwise as member 28 approaches its extreme leftward position. At the opposite end of the flat surface 54 is a similar cut-out 60 which defines a limiting surface 62 which acts to pivot member 40 clockwise as member 28 approaches its extreme limit of rightward travel.

Throughout the following description of FIGURES 4 and 4A, it must be borne in mind that rod 26 simultaneously is acting on the cans in columns 1 and 2 of magazine A. It will be remembered from previous description that a full oscillation of the rods 26 and 28 about the pivots 22 and 24 will release a can in column 1 of magazine A and drop but retain a can in column 2 of magazine A, and that precisely the same thing simultaneously is happening in magazine B. If Figures 4 and 4A be viewed, disregarding the member 40 and its associated parts, and considering only the movement of rods 26 and 28 about the pivot 24, it will be clear that no can is dropped entirely free of the magazine unless the links 18 and 20 have reached the extremity of nearly the extremity of their oscillatory movement in either direction.

The purpose of the member 40 and its associated parts which are operative only with respect to magazine B is to provide a means for interrupting, as to magazine B, the operation of the rods 26 and 28 so that at points intermediate the extremities of travel of the rods 26 and 28, cans alternately drop from column 2 in magazine B and from column 1 of magazine B. The links 18 and 20 therefore are so driven as to pause at each of two intermediate points in the travel between extreme positions, at which points a can will be released from magazine B with cans being released from alternate columns of magazine A as the links 18 and 20 arrive at their extreme positions.

Referring now to FIGURE 4, where the full line position of the parts represents the condition at the beginning of a cycle. In magazine B a can D1 in column 2 is held between side wall 14 and the turn-back portion 46 of the arm 44 of member 40 while the detent 50 rests against the portion 58 of the fixed member 52. A can C1 rests on arm 28 and is supported laterally by the wall 16. A second can D2 in column 2, magazine B is supported by rod 26 and the wall 14. The detent 50 is held in firm engagement with the surface over abutment 58 by the weight of can D1. As the link 20 rotates counterclockwise about the pivot 24, the detent 50 on member 40 is deprived of the support of the surface 58 and when the dotted line position is reached, member 40 in alignment with the link 20, the weight of the can D1 swings the member 40 about the pivot 28 to the dotted line position of FIGURE 4 and can D1 drops free of the machine. It is clear from the dotted line position shown that can D2 at this point still is supported by the rod 26 and while the can C1 in column 1 has lowered within the magazine B, it is still held by the

rod 28. Precisely, the same thing is happening at the same time in magazine A.

The rods 26 and 28 shown in dotted outline in FIGURE 4A have the link 20 in almost its extreme position of counterclockwise oscillation. A cross-member 42 and its turn-back end 48, are still in the path of the container C1 in column 1 of magazine B. The member 40 does not swing however because the detent 50 still engages the flat portion 54 of the cam member 52. Continued movement of the link 20 counterclockwise will permit the detent 50 to drop into the aperture 60 and engage the wall 62, thus holding the can C1 in position for release. The can D2 now has dropped and is resting against the rod 28 while can C2 in column 1 is supported by the rod 26. It will be noted from the foregoing description of one-half of a complete cycle that considerable lost motion is afforded so that the stopping point midway of the extremities of the oscillation need not be sharply defined. The reverse cycle simply is a mirror image of exactly what is shown in FIGURES 4 and 4A.

FIGURE 5 is a schematic diagram illustrating the four steps of a complete cycle. In this figure, only the fixed pivot 24 and the rod 26 have been indicated. It will be understood that the rod 28 duplicates the movements of the rod 26 in the opposite direction. The arrow L1 indicates the first step of the cycle in which the parts move from the full line position of FIGURE 4 through the dotted line position of FIGURE 4 and to the full line position of FIGURE 4A. This drops the can D1 from magazine B, column 2, but retains can C1 of column 1, magazine B, against the turn-back portion 48 of the arm 42. A second arrow L2 designates the second step of the cycle in which rod 26 moves to the left to its maximum extent, which does not affect the cans in magazine B but does drop a can C1 from column 1 of magazine A. On the return of the stroke illustrated by the arrow R1 a can C1 is dropped from column 1 of magazine B, and on completion of the return stroke indicated by the arrow R2, a can is dropped from column 2 of magazine A.

It will have been observed at this point that precision engineering and manufacture of the several parts is not required and that considerable wear may take place without altering the timing and functioning of the several parts. As shown in FIGURE 2, rod 26 has a portion 26' projecting through a slot 31 in the end wall 12 and purely for purposes of illustration it may be presumed that the cyclic drive is applied to the member 26'. This, however, is by no means critical and the drive may be applied to either of the rods 26 and 28 or to the pivot 24 itself. All that is really required is that each leftward oscillation take place in two steps, and that each rightward oscillation also take place in two steps, as detailed in FIGURE 5. As noted, the details of the drive are so largely optional, that no reason is seen to include such details in this disclosure.

While a specific embodiment of a means for dispensing single containers from multiple columns in multiple magazines has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. Means for dispensing containers from two vertical tandem magazines, each magazine containing two columns of containers in corded relationship, said means comprising: a pair of rods, each extending axially of the containers across both of said magazines; a pair of levers, one at each end of said magazines, each of said levers being pivoted intermediate its length, said pivots being coaxial, one of said rods connecting one pair of free ends of said levers, and the other connecting the opposite free ends of said levers; a container retainer of inverted T cross-section pivoted to the lower one of said rods and underlying only

one of said magazines with the cross bar of the T downward; a detent bar projecting from one end of the leg of said T; a fixed cam coacting with said detent bar and operative to rock said T about the rod to which it is pivoted as said rod turns around the pivots of said levers.

2. The device of claim 1, in which said cam, at each

of its ends, presents opposed but spaced active surfaces.

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