April 29, 1969 R. W. McGILL 3,441,120

CAN FEEDING MECHANISM

Filed Feb. 16, 1967

FIG. 1

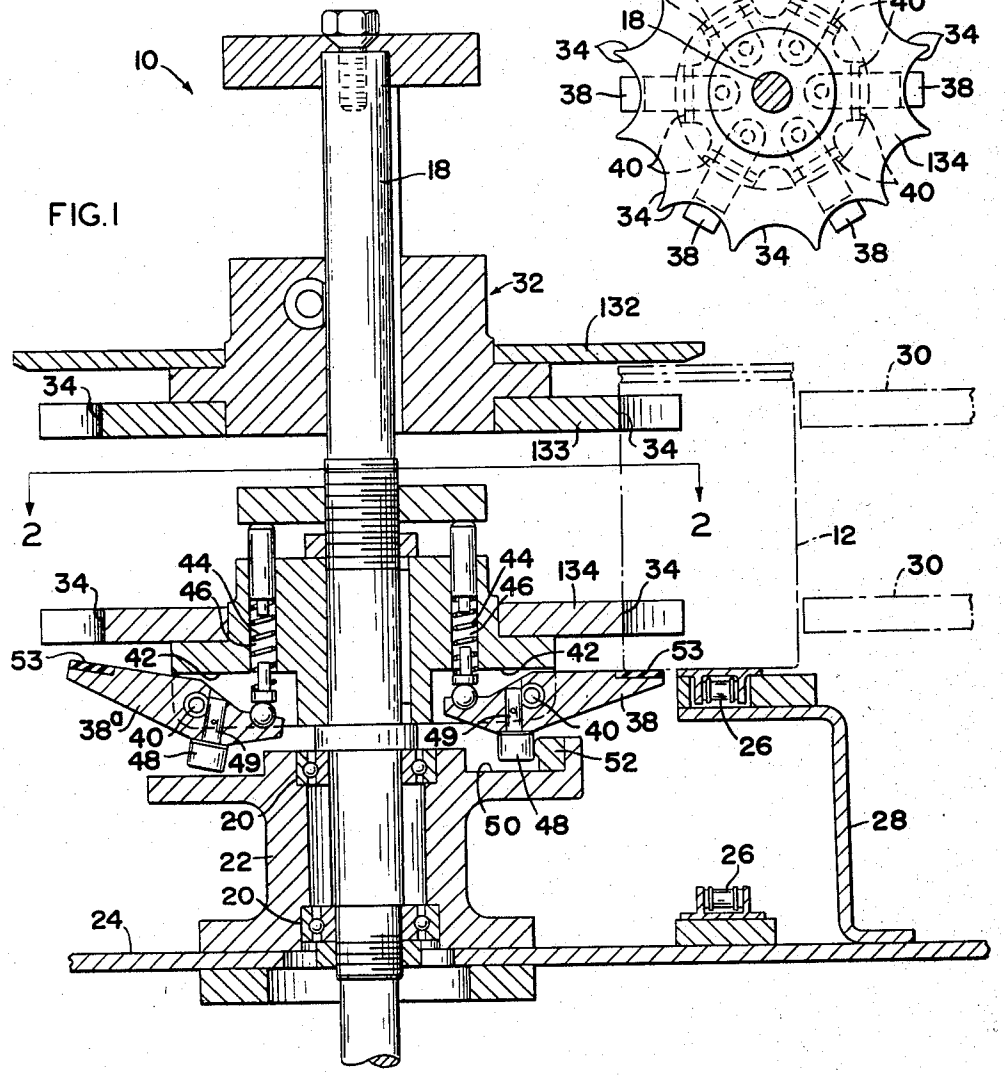


FIG. 2

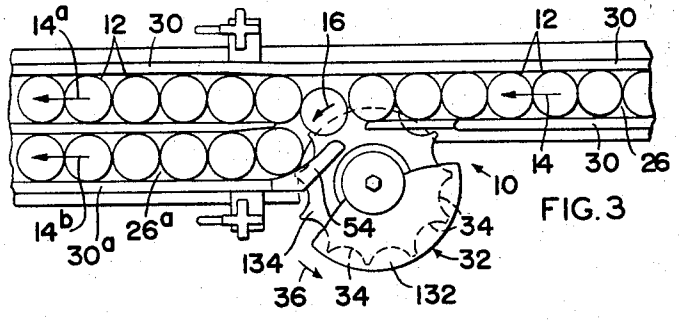


FIG. 3

INVENTOR.
ROBERT W. MC GILL

BY
Oldham & Oldham
ATTORNEYS.

United States Patent Office 3,441,120 Patented Apr. 29, 1969

3,441,120

CAN FEEDING MECHANISM

Robert W. McGill, Munroe Falls, Ohio, assignor to Geo. J. Meyer, Cudahy, Wis., a corporation of Wisconsin

Filed Feb. 16, 1967, Ser. No. 616,514
Int. Cl. B65g 47/69, 47/71
U.S. Cl. 198—31 3 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus for sorting a single row of moving cylindrical objects, such as cans, into two or more rows, the objects being fed into a disc-like spacer having a plurality of object receiving surfaces, some of the objects being passed through the spacer to continue in the single row, but other of the objects being held in the receiving surfaces as the spacer rotates an arcuate distance with the objects then being released from the receiving surfaces and directed to another moving row.

The present invention relates to a can feeding and sorting mechanism adapted to receive a single row of moving abutted objects with at least some of the objects being sorted out of the row by the can feeding mechanism in order to form at least one additional row of the abutted objects. The apparatus is basically comprised of a disc-shaped spacer means mounted substantially tangent to a moving row of abutted, cylindrical objects, such as cans, the peripheral surface of the spacer means being provided with a plurality of receiving recesses or surfaces each of which mates with and receives an individual moving object as it passes through the feed mechanism. The spacer means is driven to rotate in proper sequence whereby each object as it feeds through the spacer means engages a respective receiving surface. Some of the objects merely pass through the can feed mechanism in order to continue in the moving row, but means, for example, associated with every other receiving surface of the spacer means are adapted to grasp and hold the object in such receiving surface as the spacer means rotates an arcuate distance whereby the objects held in every other receiving surface of the spacer means are pulled away from the moving row. Means are provided to release the objects from the receiving surfaces after such objects have been pulled away from the moving row with such objects then being fed into a receiving channel to form at least one additional row of the abutted objects.

In order to obtain a better understanding of the apparatus of the invention, reference should be had to the accompanying drawing wherein:

FIG. 1 is a fragmentary, vertical section of a preferred embodiment of the can feed and sorting mechanism of the invention;

FIG. 2 is a reduced size, plan view, partly in horizontal section, of the can feed mechanism illustrated by FIG. 1, as taken on line 2—2 of FIG. 1; and

FIG. 3 is a broken-away, reduced scale, overall plan view of the can feed mechanism illustrated in FIGS. 1 and 2, particularly illustrating the way in which the can feed mechanism operates on a single moving row of cylindrical objects in order to position the cylindrical objects in two rows.

Referring to the drawings in greater detail, and with attention being particularly directed to FIG. 3, the can feed and sorting mechanism, generally illustrated by the numeral **10**, sorts a plurality of abutted cylindrical objects **12**, such as cans, which are being conveyed in a fixed path in the direction of arrow **14**, into two closely spaced

rows moving in the direction of arrows **14***a* and **14***b*, respectively. Such sorting or arranging is accomplished by passing the cans **12** through the can feed mechanism **10** whereby every other can **12** going into the mechanism **10** is fed in the direction of arrow **16** to form an additional row moving in the direction of arrow **14***b*.

By sorting the cans **12** from one single moving row into two moving rows, the cans are in proper position to have an open-ended, heat shrunk band of plastic film operatively and tightly wrapped around both rows of cans in order to provide a compact, unitary package assembly (not shown) for a plurality, such as six, of the cans **12**. One type of a package assembly formed around the cans **12** is illustrated and described in detail in Bruce W. Copping's co-pending application Ser. No. 594,125, and it should be understood that the present invention relates to apparatus for quickly and automatically sorting the cans **12** into two rows to facilitate forming the carrier assembly illustrated by such co-pending application.

Now referring to the actual can feed and sorting mechanism **10** in greater detail, reference should be had to FIG. 1 wherein it is seen that the can feed mechanism, generally illustrated by the numeral **10**, includes a support shaft or post means **18** which is rotatably journalled as by bearing means **20** in a hub **22** which is mounted on a suitable frame or base means **24**. The base means **24** also provides support for a suitable endless conveyor, or chain **26** the courses of which are mounted in spaced relationship on the base means **24** by a suitable bracket **28**. The conveyor **26** supports and moves the cans **12** in the direction of the arrows **14** of FIG. 3, which direction referring to FIG. 1 would be into the page. Any suitable guides **30** are provided to insure that the cans **12** are moved by the conveyor **26** in a single row in the direction of arrow **14**.

As is best illustrated by FIGS. 1 and 3, a disc-shaped transfer, or spacer means, generally indicated by the numeral **32**, is mounted on the support post **18** with its periphery substantially tangent to the moving row of cans **12**. The spacer means **32** includes a top plate **132** and usually upper and lower article engaging plates **133** and **134**, respectively. The outer peripheral surfaces of the plates **133** and **134** are formed with a plurality of concave recesses or receiving surfaces **34** which are vertically aligned and engage with and mate, as best illustrated by FIG. 3, with each individual can **12** as it passes thereby moving in the direction of arrow **14**. Means (not shown) are provided to drive the support post **18** so that the spacer means **32** is rotated in the direction of arrow **36** of FIG. 3. As is best illustrated by FIG. 3, the spacer means **32** is rotated so that the cans **12** are properly received within the receiving recesses or surfaces **34** as spacer means **32** rotates. Some of the cans are fed straight through the spacer means **32** in the direction of arrow **14***a* while some of the cans are fed in the direction of arrow **16** into a path defined by an adjacent guide or channel **30***a*, which path normally is parallel to and immediately adjacent the original fixed path for the articles. As the cans feed through the spacer means **32**, each individual can is received adjacent its upper surface by recess **34** of plate **133** and adjacent its bottom surface by recess **34** of plate **134**.

In order to feed at least some of the cans **12** moving in the direction of arrow **14** into channel **30***a* as the spacer means **32** rotates in the direction of arrow **36**, means are provided which are adapted to releasably bias every other can **12** passing tangent to spacer means **32** against top plate **132** as the can **12** is positioned in or received by a respective recess or receiving surface **34**. These means are basically comprised of a plurality of radially extend-

ing footer members **38**, each being pivotally operatively mounted, as by a pivot pin **40**, to the lower article engaging plate **134** by being received in radially directed slots **42** provided in the bottom of the body or center portion of the plate **134** or an associated member. Compression spring means **44** received within respective circumferentially spaced, axially directed bores **46** of the plate **134** engage with the radially inner ends of the footer members **38** in order to pivot the footer members **38** about their respective pivot pins **40** whereby the radially outer ends of the footer members are biased in an upward direction, as illustrated by footer members **38***a* of FIG. 1.

Secured to each footer member **38** and extending downwardly therefrom is a cylindrically shaped roller or cam follower or member **48**, each journalled on a shaft **49**. As is best illustrated by FIG. 1, the cam followers or members **48** extend downwardly into an open-topped flange or channel **50** provided on the top or upper surface of the hub **22**. Positioned at a radially outer portion of the channel **50** is a cam member **52**. As the transfer or spacer means **32** is rotated in the direction of arrow **36** the cam members **48** rotatably engage and move over the cam member **52** to effect pivotal movement of the respective footer members **38** as they rotate substantially tangent to the cans **12**. It is the purpose of the cam members **48** and **52** to cause the radially outer portions of each footer member to slide under and bias a particular can **12** against top plate member **132** as the footer members and the spacer means rotate. A rubber gripping pad **53** is preferably provided on the radially outer top surface of each footer member to cause each footer member to firmly grip each can as the footer member is pivoted thereunder.

As is best illustrated by FIG. 2, the radially extending footer members **38** are associated with every other receiving surface **34** with each of the footer members **38** being in substantially vertical alignment with and being positioned directly below the receiving surfaces **34** associated therewith. As the spacer means **32** rotates, alternate cans **12** are biased against top plate **132** and are held in the respective recesses or surfaces **34**. Therefore, alternate cans **12** are slid off of and pulled away from the moving conveyor **26**. As the cans **12** continue to move arcuately while remaining in their respective receiving surfaces **34**, a suitable stripping arm **54** (see FIG. 3), extending in cantilever fashion into the can feeding and sorting apparatus **10**, catches and strips the particular can **12** away from its receiving surface **34**, the top plate **132**, and the footer member **38** whereby the can **12** is fed into the path defined by the receiving channel **30***a* with the footer member **38** being free to bias upwardly again into the position indicated by footer member **38***a*.

Suitable rollers, chains, or conveyor means **26***a* can be provided to convey the cans fed into channel **30***a* in the direction of arrow **14***b*, but the force of the moving cans **12** being rapidly fed into the channel **30***a* usually is sufficient to keep the cans moving in the direction of arrow **14***b*.

The novel arrangement disclosed, wherein the footer members **38** are associated with every other receiving surface **34** in order to hold the can **12** fed thereinto in engagement with the receiving surfaces as the spacer means **32** rotates an arcuate distance, causes the moving cans **12** to be quickly and rapidly sorted into two rows of abutted cans wherein they are in proper position to allow a suitable package assembly to be formed.

While in accordance with the patents statutes only one best known emobdiment of the invention has been illustrated and described in detail, it is to be particularly understood that the invention is not limited thereto or thereby, but that the inventive scope is defined in the appended claims.

What is claimed is:

1. Apparatus for arranging a single row of moving, abutted objects, such as cans, being fed through a fixed path, into at least two rows, including,

disc-shaped spacer means positioned to have its periphery tangent to the moving row of objects, the outer peripheral surface of the spacer means being formed with a plurality of recesses which mate with an individual object as it passes thereby,

means to rotate the spacer means whereby each object engages a respective recess as the objects pass by said spacer means, and

holding means associated with circumferentially spaced recesses to hold an object in such recesses as the spacer means rotates an arcuate distance to thereby pull the object held in one of such recesses away from the moving row of objects,

said spacer means including a top plate, and said holding means being associated with a lower portion of the spacer means to engage the bottom of an object and force it into engagement with the top plate for movement with the spacer means,

said holding means including footer members pivotally and operatively mounted on and radially extending of said spacer means substantially directly below certain of said recesses of the spacer means with which they are associated, and compression spring means operatively carried by said spacer means and engaging with the radially inner ends of the individual footer members to bias the radially outer ends thereof upwardly continuously; and

cam and follower means operatively connecting to said footer members to move them downwardly and under an object as said footer member rotates with said spacer means to move them into article engaging positions for portions of their rotary movement.

2. Apparatus for arranging a single row of moving, abutted objects, such as cans, being fed through a fixed path, into at least two rows, including

disc-shaped spacer means positioned to have its periphery tangent to the moving row of objects, the outer peripheral surface of the spacer means being formed with a plurality of recesses which mate with an individual object as it passes thereby,

means to rotate the spacer means whereby each object engages a respective recess as the objects pass by said spacer means,

holding means associated with circumferentially spaced ones of said recesses to hold an object in such recesses as the spacer means rotates an arcuate distance to thereby move the object held in one of such recesses away from the moving row,

means to release the object from its respective recess after the object is moved away from the moving row,

means receiving the released objects to form at least one additional row of abutted objects,

said spacer means including a top plate with portions extending out over said recesses, and said holding means being associated with a lower portion of the spacer means to engage the bottom of an object and force it into engagement with the top plate for movement with the spacer means,

said holding means each including

a footer member pivotally and operatively mounted on and radially extending of said spacer means, the footer members being in vertical alignment with and substantially directly below a said recess of the spacer means with which it is associated, and

a compression spring means operatively carried by said spacer means and engaging with the radially inner end of the individual footer members to bias the radially outer ends thereof in an upward direction continuously; and

cam and follower means operatively connecting to said footer members to move them downwardly and under an article as said footer members rotate with said

spacer means to move them into article engaging positions for portions of their rotary movement.

3. Apparatus for arranging a single row of moving, abutted objects, such as cans, being fed through a fixed path, into at least two rows, including

disc-shaped spacer means positioned to have its periphery tangent to the moving row of objects, the outer peripheral surface of the spacer means being formed with a plurality of recesses which mate with an individual objects as it passes thereby,

means to rotate the spacer means whereby each object engages a respective recess as the objects pass by said spacer means,

holding means associated with circumferentially spaced ones of said recesses to hold an object in such recesses as the spacer means rotates an arcuate distance to thereby move the object held in one of such recesses away from the moving row,

means to release the object from its respective recess after the object is moved away from the moving row,

means receiving the released objects to form at least one additional row of abutted objects,

base means,

support post means journalled on said base means, said spacer means being mounted on said support post means for rotation therewith,

said holding means including footer members pivotally carried by said spacer means and continuously biased to move their outer ends upwardly, and

cam means to control said footer members,

said cam means being comprised of a cam member positioned on said base means, and cam followers secured to said footer members and extending therefrom to engage said cam member as the footer members are rotated to effect pivotal movement of the footer members to bring them to article engaging positions.

References Cited

UNITED STATES PATENTS

2,602,533	7/1952	Bruce.
2,649,184	8/1953	Dodge.
2,743,001	4/1956	Nordquist.
2,920,739	1/1960	Woldin.

EDWARD A. SROKA, *Primary Examiner.*