Sept. 18, 1956 A. S. ROSE 2,763,359

ARRANGING APPARATUS FOR CANS AND SIMILAR CONTAINERS

Filed Aug. 7, 1951 2 Sheets-Sheet 1

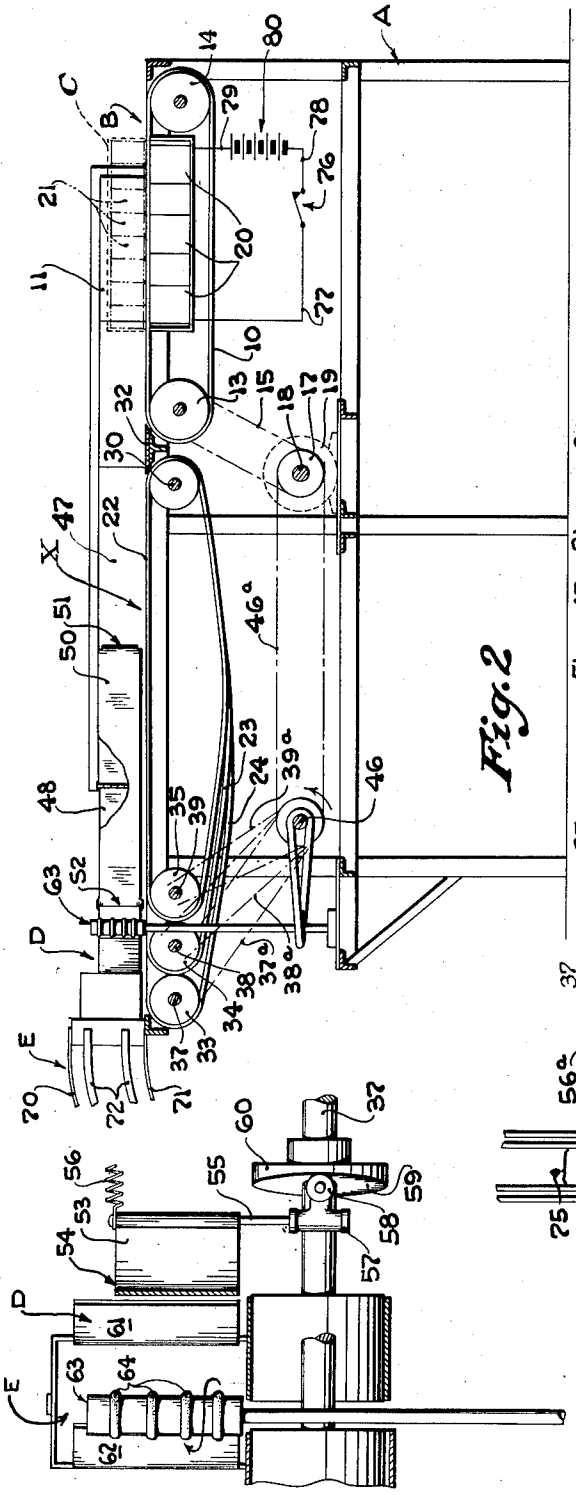

Fig. 2

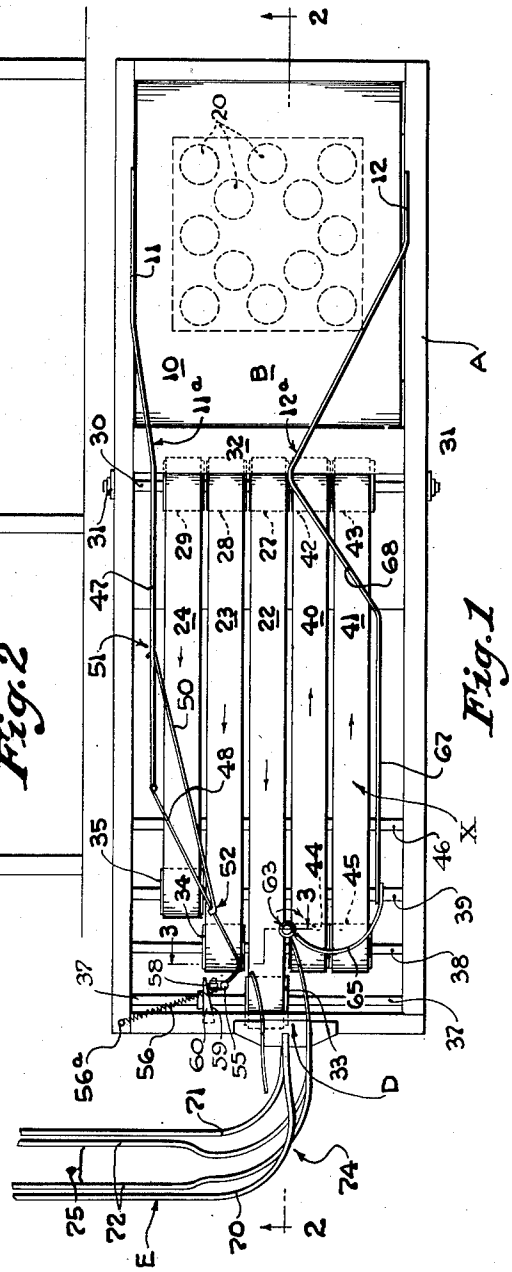

Fig. 1

Fig. 3

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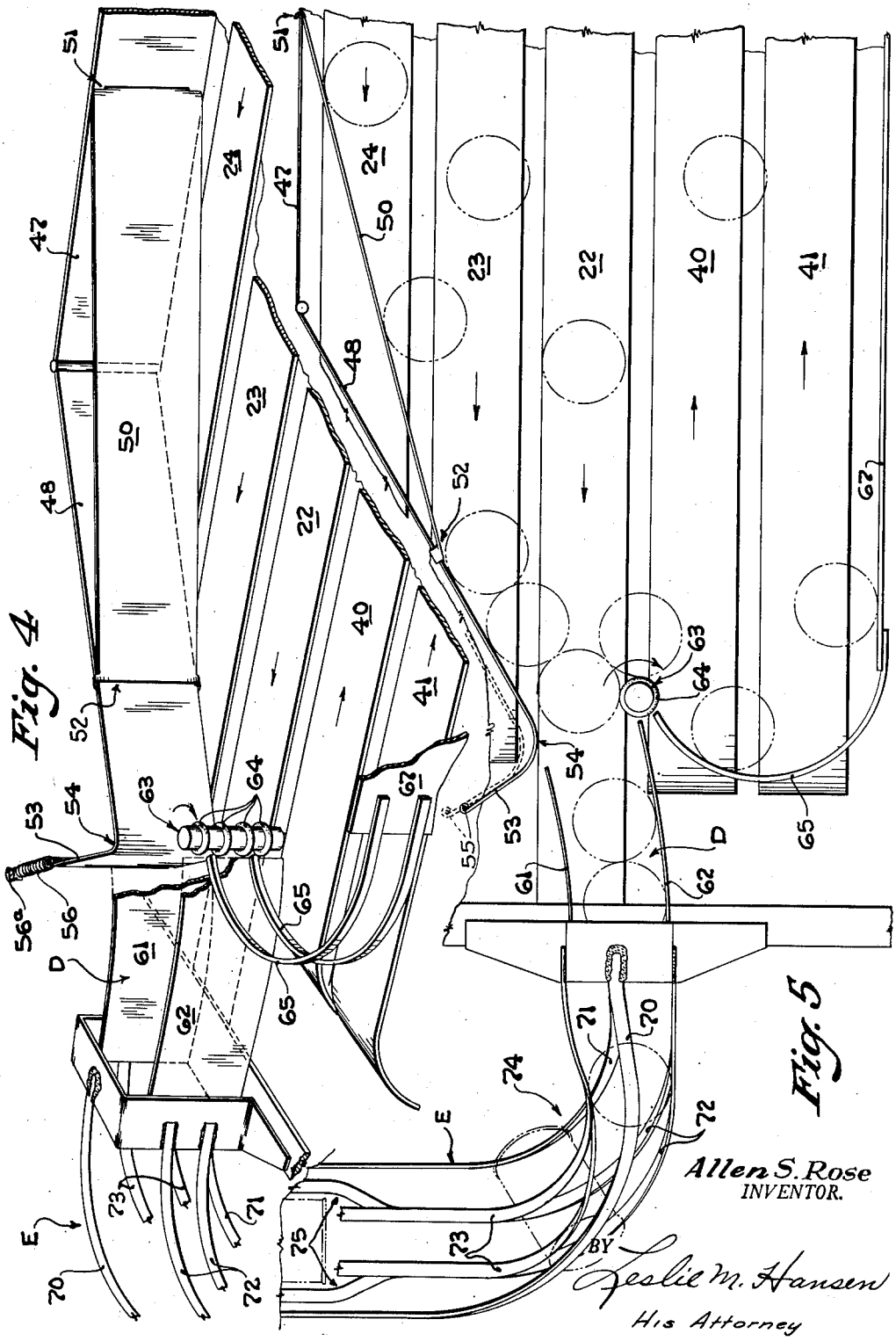

Fig. 4

Fig. 5

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ARRANGING APPARATUS FOR CANS AND SIMILAR CONTAINERS

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20 Claims. (Cl. 198—30)

The present relates to conveying and arranging mechanism, and pertains more particularly to apparatus for the rearranging of containers or cans from an indiscriminate mass thereof into a single file.

In the packing of liquid and solid foods or other products into bottles, jars or cans, it is customary to receive the containers in shipping cases, such as cartons or boxes, with the open ends of the containers all directed toward one side of the case. Glass containers, such as bottles or jars, being comparatively heavy, may be dumped out of the cases easily by first removing the side of the case covering the bottoms of the containers, and then inverting the case onto a receiving or sorting table. The lighter weight metal containers or cans, however, tend to hang up in the cases when they are so inverted, with the result that some of the cans may tip over when the case in which they are packed is withdrawn. Since the machines for filling or otherwise processing the containers customarily are designed to receive the containers in single file, it usually is necessary to rearrange the containers into such single file for feeding them to the processing machines.

In the past, difficulty has been experienced in devising a machine which would perform this rearranging operation rapidly, without damaging or tipping over containers, and without likelihood of jamming.

The present invention contemplates the provision of mechanism for rapidly and accurately rearranging a massed group of containers into a single file thereof. The invention also has as an object, the provision of mechanism for receiving the contents of a case of containers dumped promiscuously in upright position thereon, and for rapidly rearranging the containers into an advancing single file thereof, while at the same time removing excess containers from a zone wherein jamming is apt to occur.

A still further object of the invention is to withdraw in upright condition from a case in which they are packed, a plurality of empty cans of magnetically permeable material when said case with a side removed therefrom is inverted onto a receiving conveyor forming part of a mechanism for rearranging the containers into a single file thereof.

These and other objects and advantages of the invention will be apparent from the following description and the accompanying drawings, wherein:

Fig. 1 is a plan view of a mechanism embodying the invention, portions thereof being broken away.

Fig. 2 is a vertical longitudinal sectional view taken along line 2—2 of Fig. 1, portions thereof being broken away.

Fig. 3 is an enlarged, fragmentary, sectional view taken along line 3—3 of Fig. 1.

Fig. 4 is an enlarged, fragmentary, perspective view of the discharge end of the apparatus shown in Figs. 1 and 2.

Fig. 5 is an enlarged, fragmentary, plan view of the portion of the apparatus shown in Fig. 4.

In general, the illustrated mechanism comprises a frame

A of conventional, structural steel type. A belt-type receiving conveyor B (Figs. 1 and 2), of a width to receive cases X of the containers to be arranged, is mounted on the frame A. While machines embodying the present invention are capable of handling various types of containers, including glass jars and bottles, the accompanying illustrations show the machine as being used with metal containers. In the present description and claims, therefore, the word "cans" is intended to include all such type of containers.

The cans deposited on the receiving conveyor B are carried toward the left, as shown in Figs. 1 and 2, and are there transferred onto an arranging area X. From the arranging area X the cans are discharged in single file through a throat D into a usual can carrying chute E.

The receiving conveyor B comprises a belt **10** of a width to receive a case C of cans deposited thereon. A pair of side retaining walls **11** and **12** are mounted along opposite sides of the belt **10**. The belt **10** is trained over rollers **13** and **14**, and the roller **13** has driven connection, by a drive belt **15**, with a pulley **17** mounted on the shaft **18** of a motor driven speed reducer **19**.

A plurality of magnets **20**, which may be either permanent or electro-magnets, are mounted closely to underlie the receiving belt **10**. Then, when a case C of cans **21** is inverted to deposit the cans, bottoms down, on the receiving conveyor B with the magnets **20** energized, the magnetic attraction of the magnets upon the sheet steel of the cans will draw the cans tightly against the receiving belt **10**. With the cans thus held, inverted case C may be raised free of the cans without danger of having any of the cans hang up in the case.

The side walls **11** and **12** converge, at **11***a* and **12***a* respectively, toward the discharge end of the receiving conveyor B to direct the case C of cans **21** dumped thereon onto three forwardly driven conveyor belts **22**, **23** and **24**. All three of the belts **22**, **23** and **24** have the ends thereof toward the receiving belt **10** trained around similar pulleys **27**, **28** and **29**, respectively. These pulleys are mounted to rotate freely on a shaft **30** supported in brackets **31** secured to the main frame A.

A transfer shelf **32**, over which the cans **21** are adapted to slide freely, is provided between the receiving conveyor B and the forwardly driven, can arranging belts **22**, **23** and **24**. The other ends of the belts **22**, **23** and **24** are trained around three separate and independently driven pulleys **33**, **34** and **35** (Figs. 1 and 2) mounted respectively on shafts **37**, **38** and **39**. The three pulley support shafts **37**, **38** and **39** are journaled in conventional bearing supports, not shown, mounted on the frame A. The shafts **37**, **38** and **39** are driven (Figs. 1 and 2) at different speeds by separate belts **37***a*, **38***a* and **39***a*, respectively, from a countershaft **46**. The countershaft **46** in turn is driven by a usual drive belt **46***a* from the speed reducer shaft **18**.

The inner belt **22** is driven to travel faster than the intermediate belt **23**, which in turn is driven to travel faster than the outer belt **24**. All three of the belts **22**, **23** and **24** travel faster than the receiving belt **10**, so as to remove the containers rapidly and to space them apart as they are pushed slidably across the transfer shelf **32**. Two oppositely moving return belts **40** and **41** are mounted on the opposite side of the belt **22** from the belts **23** and **24**. These two latter belts **40** and **41** have their ends adjacent the receiving belt **10** mounted on pulleys **42**, **43** journaled to rotate freely on the same shaft **30** as the pulleys **27**, **28** and **29**.

The left hand ends of the return belts **40** and **41** are trained over drive pulleys **44** and **45**, which are driven by conventional drive means, not shown, so as to drive the return belts **40** and **41** in the opposite direction from the

three first mentioned belts **22**, **23** and **24**. Preferably the outer return belt **41** is driven at a slower speed than the inner return belt **40**.

All of the conveyor belts of the illustrated mechanism have their upper conveying surfaces disposed substantially in the same plane, so as to facilitate transfer of the containers from one belt to the other.

A side wall **47**, forming a continuation of the side retaining wall **11** for the receiving conveyor B, prevents lateral displacement of the containers beyond the outermost forwardly driven belt **24**.

An oscillating wall portion **48** is hingedly connected to the left hand end of the side wall **47**, as shown in Figs. 1, 2, 4 and 5, and a resiliently flexible deflector plate **50** is hingedly connected to the side wall **47** at **51**. The deflector plate **50** has slidable connection with the oscillating wall member **48** at **52**. The left hand end portion **53** of the oscillating wall member **48** is bent outwardly at **54**. The bend **54** in the oscillating plate **48**, which is the farthest projection of this oscillating plate, is in alignment, in one of its positions, with a side edge of the center high speed belt **22**.

For oscillating the wall member **48**, a downwardly extending post **55** (Fig. 3) is connected to the end of the outwardly bent portion **53** of the oscillating wall member **48**, and a fitting **57**, having a cam follower roller **58** mounted for free rotation therein, is mounted on the lower end of the post **55**. The cam follower roller **58** rides against the tilted face **59** of a rotary cam plate **60** mounted on the shaft **37**. A coil spring **56** (Figs. 1, 3, 4 and 5) is connected in tension from the free end of the oscillating wall member **55** to a post **56***a* secured to the frame A to retain the roller **58** in contact with the cam plate **60**.

A fixed guide wall **61** is mounted beyond the bend **54** in the oscillating wall member **48** to form one side of the throat D which guides the cans **21** into the chute E, to be described later herein.

A second fixed guide wall **62** is mounted in laterally spaced relation to the first throat side wall **61** to define the other side of the throat D through which the cans pass to the chute E. A rotary deflector post **63** is mounted at the upstream end of the wall **62** at the opposite side of the central high speed belt **22** from the bend **54** in the oscillating wall portion **48**. A plurality of frictional bumper rings **64**, which may be of resilient rubber, are mounted at axially spaced intervals to encircle the portion of the rotary deflector post **63** above the level of the conveyor belts.

A pair of arcuately curved bars **65**, **65** extend transversely across the two return belts **40** and **41**. The inner ends of the bars **65**, **65** are connected to the end of the throat defining wall **62** adjacent the rotary deflector post **63**, while their outer ends are connected to a side wall **67** which extends along the outer side of the outermost return belt **41**. An angularly inwardly directed wall portion **68** (Fig. 2), which is a continuation of the side wall **67** and of the wall portion **12***a* is mounted to extend obliquely across the return belts **40** and **41** to deflect inwardly onto the central, high speed belt **22** any cans which may be carried back by the return belts.

The discharge chute E is of a conventional type, having top and bottom guide rods **70** and **71**, respectively (Figs. 4 and 5) adapted to engage opposite ends of the cans entering the chute E in upright position. A pair of side rods **72**, **72** and **73**, **73** are provided on opposite sides of the chute E to engage the sides of the cans entering the chute E to guide the cans along through the chute. The chute illustrated is formed with a quarter twist at **74** therein to tilt the cans from upright to axially horizontal position. The side retaining rods **72**, **72** which are on the bottom of the chute after the completion of the quarter twist **74** therein, are spread apart for a short distance as at **75** (Fig. 5) to allow any cans which may enter the chute E in a horizontal lengthwise position to drop out between the spread apart portions of the rods.

The operation of the mechanism will be described briefly. Assuming that the mechanism is in operation, with the upper surface of the receiving belt **10** moving toward the left as shown in Figs. 1 and 2, the magnets **20**, if of the electro-magnetic type, may be energized by closing a switch **76** in a conventional electrical circuit comprising conductors **77**, **78** and **79**, the switch **76** and a battery **80**, or other suitable source of electrical energy. The switch **76** may be closed either continuously during the operation of the machine, or momentarily as each case C of cans **21**, with a side thereof removed to expose the bottom of the cans, is dumped onto the receiving belt **10**.

The three forwardly driven belts **22**, **23** and **24** also will be driven at successively increased speeds, from the outermost, relatively slowly moving belt **24**, to the central, relatively high speed belt **22**. The two return belts **40** and **41** also will be driven in the opposite direction from the belts **22**, **23** and **24**, the outer return belt **41** preferably being driven at a slightly slower speed than the inner return belt **40**. The deflector post **63** will be rotatively driven in the direction of the curved arrows adjacent thereto in Figs. 1, 4 and 5, and the oscillating wall **48** will be moved through successive cycles of oscillation by rotation of the cam plate **60**.

As each case of cans **21** is dumped onto the receiving conveyor B the magnets **20** attract the cans to hold them on the receiving belt **10** while the case C is being removed. The receiving belt **10** then carries the cans **21** toward the left, as shown in Figs. 1 and 2, the rearward cans pushing those ahead of them across the transfer shelf **32**, where the converging wall portions **11***a* and **12***a* guide the cans onto one or the other of the forwardly moving belts **22**, **23** and **24**. Any of the cans which rest partly on any two of the belts will tend to be deflected by impact with cans on the adjacent differentially moving belts onto a single one of the belts.

The cans passing onto the high speed center belt **22** are rapidly transported directly to and through the throat D and into the chute E. The position of the rotating deflector post **63** and the slight lateral curvature of the throat walls **61** and **62** slow down the movement of the cans **21** somewhat before entering the chute E to avoid damaging the cans. The cans which pass onto the two more slowly moving forwardly driven belts **23** and **24** are advanced thereby until the foremost container on each of said belts come into contact with the flexible deflector plate **50** or the oscillating wall portion **48**.

The different rates of travel of the three belts **22**, **23** and **24** tend to string the cans out into three echeloned columns, so that at least a portion of the cans on the fastest belt **22** will have passed therefrom before those on the adjacent, slower belts are transferred thereto.

The oscillations of the wall portion **48** and of the flexible plate **50** supported thereon, nudge the containers along these obliquely disposed members toward and onto the central belt **22**, which thereupon carries them through the throat D into the chute E.

In the event that the cans should be fed to the three belts **22**, **23** and **24** more rapidly than the belts could dispose of them in the manner described previously herein, the cans might tend to jam up at the entrance to the throat D. In such event, the rotating rubber ringed deflector post **63** will frictionally engage any cans which may be held against it, exerting a transverse deflecting force on such cans in the direction of the small curved arrow in Figs. 1, 4 and 5. This action by the rotating deflector post **63** urges any such cans which might have a tendency to jam against it onto the inner return belt **40**, where they are returned toward the receiving end of the machine. There the cans again are deflected, by the obliquely disposed side wall portion **68** onto the central high speed forwardly driven belt **22**.

In the event that a very great excess of cans should be fed into the machine, any excess cans tending to jam

against the rotating deflecting post **63** would be diverted by the action of the rotating post **63** onto one or both of the return belts **40** and **41**, both of which would then return the excess cans to the receiving end of the belt **22** for feeding back onto the belt **22** as described previously herein.

By driving the outer return belt **41** at a slower speed than the inner return belt **40**, the cans on the inner return belt will engage the deflecting wall portion **68** and will be returned onto the central high speed belt **22** in advance of the cans on the outer return belt **41**, thus tending to string the cans out into differentially moving single file columns, in the same manner as that described for the two outer forwardly moving belts **23** and **24**.

By properly adjusting the relative speeds of the various belts of the machine in the manner described herein, the mechanism will tend to clear itself of any tendency to form a jam which might interfere with its operation.

While we have illustrated and described a preferred embodiment of the present invention, it will be understood, however, that various changes and modifications may be made in the details thereof without departing from the spirit and scope of the invention as set forth in the appended claims.

Having thus described our invention, what we claim as new, and desire to protect by Letters Patent, is as follows:

1. Apparatus for arranging an indiscriminate mass of upright cans into single file, comprising a can arranger having a discharge throat at one end thereof of a width to pass cans in single file therethrough, forward conveying means of a width to carry a single file of cans thereon extending centrally of the arranger and directed to carry the cans thereon directly toward and into said throat, lateral forward conveying means mounted along one side of the central conveying means to move at a slower speed than, and in the same direction as the central forward conveying means, return conveying means mounted along the other side of the central conveying means to move in a direction opposite thereto, first can diverting means mounted transversely of the lateral forward conveying means and positioned to divert cans on the latter toward said throat, deflector means adjacent a side of the throat and operated to move transversely away from the throat cans misaligned therewith, and second can diverting means mounted transversely of the return conveying means at a point remote from said throat in the direction of return conveying means travel and positioned to divert cans on the latter onto said central conveying means.

2. Apparatus for arranging an indiscriminate mass of upright cans into single file, comprising a can arranger having a discharge throat of a width to pass cans in single file therethrough, central forward conveying means centrally of the can arranger mounted to move cans supported thereon toward and through said throat, lateral forward conveying means mounted on one side of the central conveying means to move in the same direction as the central forward conveying means, return conveying means mounted on the other side of the central conveying means to move in a direction opposite thereto, deflecting means mounted to extend transversely of each of the lateral forward and return conveying means and disposed to divert cans conveyed on said lateral forward and return conveying means toward the central conveying means, and means for cyclically moving the deflecting means extending transversely of the lateral forward conveying means to assist in diverting cans toward the central conveying means.

3. Apparatus for arranging an indiscriminate mass of upright cans into single file, said apparatus comprising an arranger having a discharge throat at one end thereof of a width to pass cans in single file therethrough, first forward conveying means mounted to extend lengthwise in the arranger and toward and through said throat, second forward conveying means mounted at one side of the first forward conveying means, drive means mounted to drive said first and second forward conveying means in the same direction to convey cans on said first conveying means toward and through said throat in single file, means mounted transversely of said second conveying means and disposed to divert cans on the latter onto said first forward conveying means directly ahead of said throat, return conveying means on the opposite side of the first forward conveying means from said second forward conveying means, drive means mounted to drive said return conveying means in an opposite direction from the first and second forward conveying means, deflector means adjacent a side of the throat and operated to move transversely away from the throat cans misaligned therewith, and deflecting means mounted transversely of the return conveying means and disposed to divert cans on the latter onto the central conveying means at a point substantially removed from said throat in the direction of return belt travel.

4. Can arranging apparatus comprising a receiver mounted to receive a case of cans of magnetically permeable material dumped in upright position thereon, magnetic means mounted beneath the receiver for attracting the cans dumped thereon to retain the cans in upright position, a plurality of forward conveyors mounted in side by side relation with one end thereof adjacent said receiver, means for transferring the cans in upright condition from the receiver onto said conveyors, drive means mounted to drive said forward conveyors at different rates of speed in a direction away from said receiver, a discharge throat of a width to pass cans in single file therethrough aligned with one of said forward conveyors at a point substantially removed from said receiver, first deflecting means mounted to deflect cans from a forward conveyor other than that with which said throat is aligned onto the conveyor aligned with said throat, a can diverter mounted adjacent said throat and having a portion thereof driven to move transversely of the direction of movement of said forward conveyors to remove from the throat entrance excess cans tending to jam therein, and return means mounted adjacent said can diverter to receive the excess cans thus removed and transport them to a point on one of said forward conveyors rearwardly of said throat.

5. Apparatus for arranging containers in single file, said apparatus comprising a receiving belt mounted with a run thereof disposed to receive an indiscriminate mass of containers in upright condition thereon, means for driving the receiving belt in a predetermined direction, a plurality of conveyor belts mounted in laterally adjacent relation to receive containers from said receiving belt, means for driving said conveyor belts at different speeds and in the same direction as said receiving belt, a discharge throat of a width to pass containers in single file therethrough, said throat being in line with a faster moving one of said conveyor belts, a diagonally disposed deflector member mounted to extend transversely of a slower moving one of said conveyor belts, and positioned to deflect containers on said slower moving conveyor belt toward the faster moving conveyor belt and toward said throat, a rotary deflector post mounted on the opposite side of said throat from said diagonally disposed deflector member, to deflect from the faster moving conveyor belt containers misaligned with said throat, and means for returning containers deflected by said rotary deflector post to said faster moving belt at a point thereon closer to said receiving belt than said rotary deflecting post.

6. Apparatus for arranging an indiscriminate mass of cans into single file comprising a receiver of a size to receive a case of cans thereon, an arranger mounted with one end thereof adjacent said receiver, means mounted to move the cans from the receiver onto the arranger, a discharge throat leading from the arranger at the opposite end thereof from said receiver, said throat being of a width to pass cans in single file therethrough, direct can conveying means extending lengthwise of said ar-

ranger from a point adjacent said receiver into said throat, means for moving the cans on opposite sides of said direct can conveying means in opposite directions alongside said direct conveying means, deflector means adjacent a side of the throat and operated to move transversely away from the throat cans misaligned therewith, and means mounted to divert the cans on opposite sides of said direct conveying means onto the latter for conveyance thereon to and through said throat.

7. Can arranging apparatus comprising a discharge throat, a first can conveyor belt extending toward and into said throat to carry cans thereon directly into said throat, a second belt mounted along one side of the first to run in the same direction thereas, a first deflector mounted to deflect cans from the second belt onto the first belt adjacent the throat, a return belt mounted along the other side of the first belt to run in the opposite direction therefrom, a divider mounted between the first belt and the return belt ahead of the throat to divide out excess cans which may tend to jam up ahead of the throat, a second deflector spaced from the divider in the direction of return belt travel and mounted to deflect back onto the first belt cans divided out by the divider, and means for feeding an indiscriminate mass of upright cans onto said first and second belts at the opposite end thereof from said throat.

8. Can arranging apparatus comprising a first can conveyor, a discharge throat extending transversely of said first conveyor to pass cans traveling on said first conveyor through said throat, a second conveyor mounted along one side of the first conveyor to run in the same direction whereas, a first deflector mounted to deflect cans from the second conveyor onto the first conveyor adjacent the throat, return means mounted along the other side of the first conveyor, a divider mounted between the first conveyor and the return means ahead of the throat to divide out excess cans which may tend to jam up ahead of the throat, a second deflector spaced from the divider in the direction of return means travel to deflect back onto the first conveyor cans divided out by the divider, and means for feeding an indiscriminate mass of upright cans onto said first and second conveyors.

9. An arrangement according to claim 8 wherein the divider is an upright rotary element.

10. An arrangement according to claim 8 wherein the divider is a rotary element of smaller diameter than the cans to be divided out thereby.

11. Can arranging apparatus comprising a discharge throat, a first can conveyor extending toward and into said throat, a second conveyor mounted along one side of the first conveyor to run in the same direction thereas, a first deflector mounted to deflect cans from the second conveyor onto the first conveyor adjacent the throat, return means mounted along the other side of the first conveyor, a divider comprising an upright rotary element surrounded at axially spaced intervals with resilient bumper rings which project outwardly beyond the remainder of the divider to engage cans, mounted between the first conveyor and the return means ahead of the throat to divide out excess cans which may tend to jam up ahead of the throat, a second deflector spaced from the divider in the direction of return means travel to deflect back onto the first conveyor cans divided out by the divider, and means for feeding an indiscriminate mass of upright cans onto said conveyor.

12. Can arranging apparatus comprising a discharge throat, a first can conveyor extending toward and into said throat, a second conveyor mounted along one side of the first conveyor to run in the same direction thereas, a first deflector mounted to deflect cans from the second conveyor onto the first conveyor adjacent the throat, return means mounted along the other side of the first conveyor, a divider comprising a rotary element with rotary bumper rings mounted thereon at axially spaced intervals, mounted between the first conveyor and the return means ahead of the throat to divide out excess cans which may tend to jam up ahead of the throat, means for rotating the divider to move its side remote from the throat in a direction toward the return belt, a second deflector spaced from the divider in the direction of return means travel to deflect back onto the first conveyor cans divided out by the divider, and means for feeding an indiscriminate mass of upright cans onto said conveyors.

13. Can arranging apparatus comprising a discharge throat of a width to pass cans in single file therethrough, a high speed forward can conveyor belt of a width to carry a single file of cans thereon extending toward and into said throat to carry cans thereon directly into and through said throat at high speed, a slower forward belt mounted along one side of the high speed belt to run in the same direction as the high speed belt, a first deflector mounted to deflect cans from said slower belt onto the high speed belt ahead of the throat, a return belt mounted along the other side of the high speed belt, a divider mounted between the high speed belt and the return belt ahead of the throat to divide out onto the return belt excess cans which may tend to jam up ahead of the throat, a second deflector extending toward the return belt from the divider to deflect fully onto the return belt cans divided out by said divider, a third deflector spaced from the divider in the direction of return belt travel to deflect back onto the high speed belt cans divided out by the divider, and means for feeding an indiscriminate mass of upright cans onto said high speed and slower forward belts at a substantial distance ahead of the throat.

14. An arrangement according to claim 13 wherein a second slower forward belt is mounted laterally beyond the first slower forward belt, said second slower forward belt being driven at a speed slower than that of the first slower belt.

15. An arrangement according to claim 13 wherein a second return belt is mounted laterally beyond the first return belt, said second return belt being driven at a speed slower than that of the first return belt.

16. Can arranging apparatus comprising a plurality of forward conveyor belts each of a width to carry a single file of cans thereon arranged in side by side relation, means for feeding an indiscriminate mass of cans in upright condition onto the receiving end of said forward belts, a discharge throat of a width to pass cans in single file therethrough extending transversely of the discharge end of a side one of said forward belts to receive directly cans carried by said one side belt, a return belt at a side of the forward belt having the discharge throat, first can deflecting means extending transversely of the forward belts other than that having the discharge throat, said first deflecting means being directed to deflect cans onto said one side belt ahead of said throat, second deflecting means extending transversely of the return belt closely ahead of and directly angularly away from said throat, and third deflecting means extending transversely of the return belt at a point spaced substanially from the throat in the direction of return belt travel and directed to deflect cans returned by the return belts back onto the forward higher speed belt.

17. An arrangement according to claim 16 wherein stop means is provided along the side of the throat opposite the first deflector at a point rearwardly beyond the first deflector to direct cans diverted onto said one side belt by the first deflector into the throat.

18. An arrangement according to claim 16 wherein said one side belt extends into and through the throat.

19. Can arranging apparatus comprising a plurality of forward conveyor belts arranged in side by side relation, means for feeding an indiscriminate mass of cans in upright condition onto said forward belts, means for driving said forward belts forwardly at different speeds, a side one of said forward belts being driven at a higher speed than the others thereof, a discharge throat extending transversely of the higher speed forward belt to pass

cans on the latter belt directly into the throat in the direction of forward belt travel, a plurality of return belts arranged in side by side relation on the opposite side of the higher speed forward belt from another of the forward belts, means for driving an outer return belt at a slower speed than that of the return belt adjacent the higher speed forward belt, first can deflecting means extending transversely of the forward belts other than the higher speed one thereof, said first deflecting means being directed to deflect cans toward said throat, second deflecting means extending transversely of the return belts to deflect cans from said higher speed belt away from said throat, and third deflecting means extending transversely of the return belts rearwardly of the throat to deflect cans returned by the return belts onto said higher speed forward belt.

20. An article arranger comprising a high speed forward belt of a width to carry articles in single file thereon, a throat at the discharge end of said high speed belt to pass articles on said high speed belt aligned therewith directly therethrough, a supplementary forward belt arranged alongside said high speed belt to feed articles

thereon onto the high speed belt ahead of the throat, means ahead of the throat on the opposite side of the high speed belt from the supplementary forward belt to clear jams of articles ahead of the throat, and return means mounted to carry articles cleared by said clearing means back onto the high speed belt at a point remote from the throat in a direction opposite that of high speed belt travel.

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