

March 4, 1952

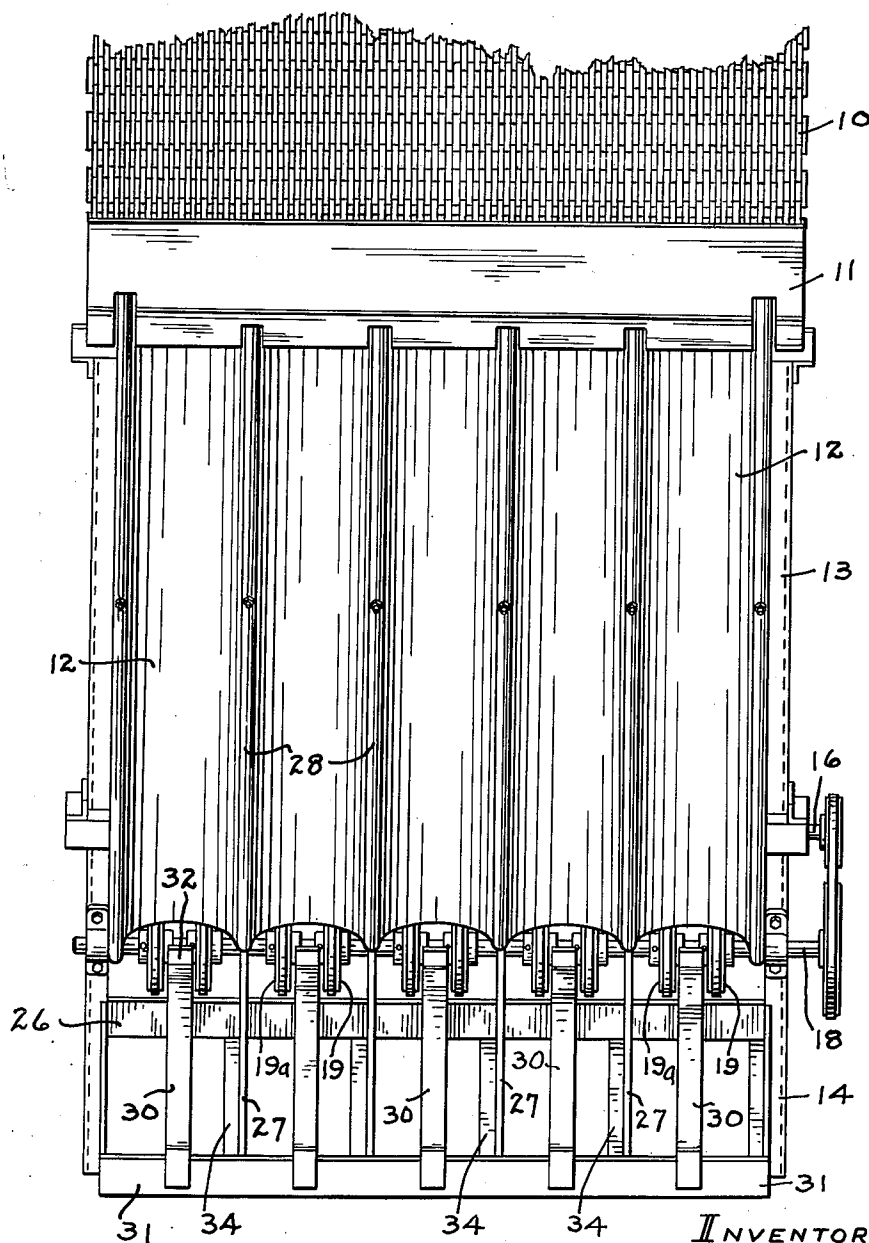
R. F. LAUGHLIN
CAN ALIGNER AND CONVEYER

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3 Sheets-Sheet 1

Fig. 1.



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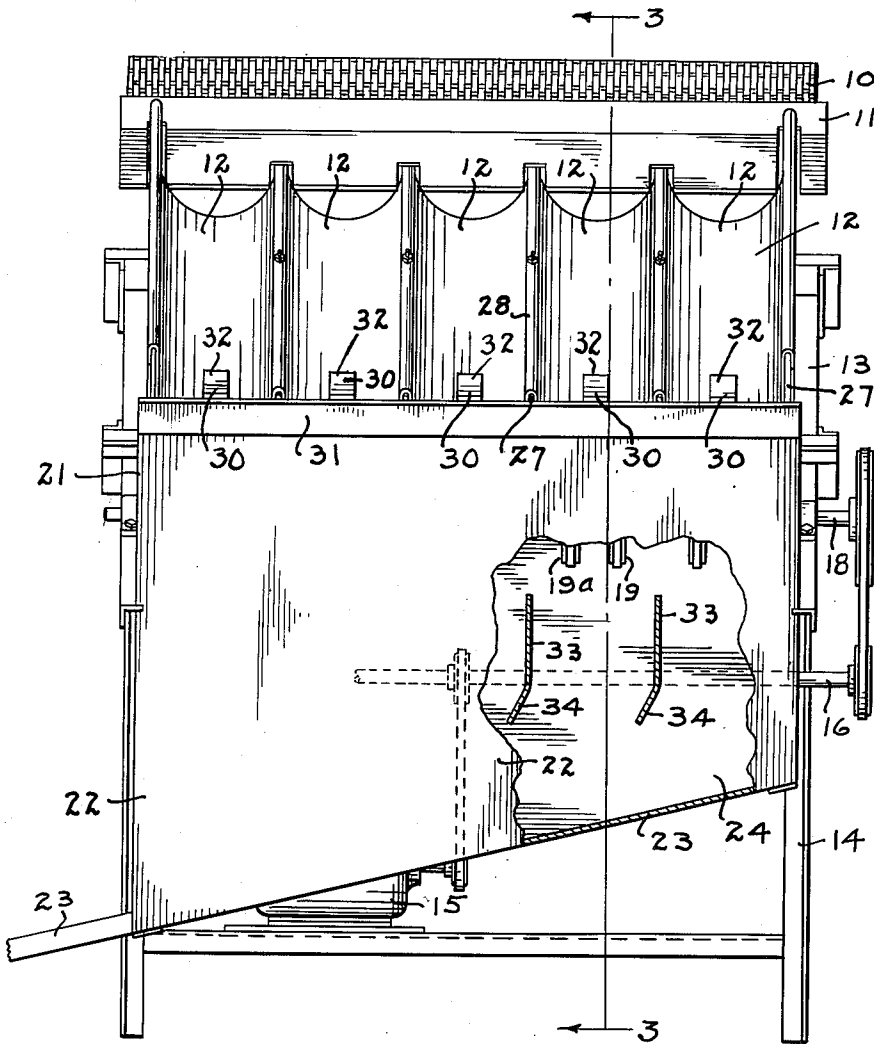


Fig. 2.

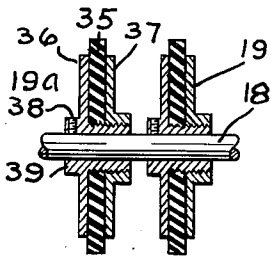


Fig. 7.

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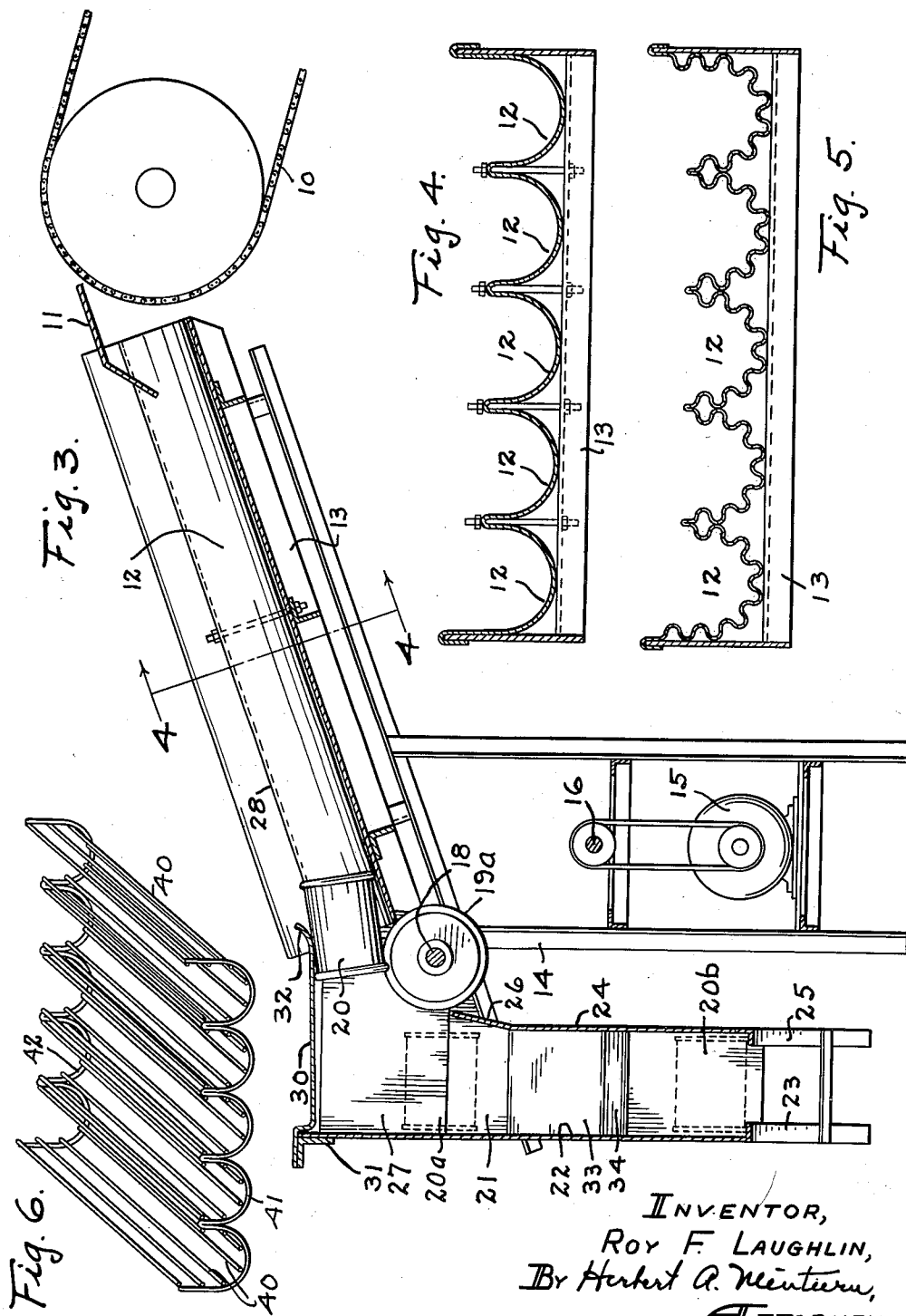
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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CAN ALIGNER AND CONVEYER

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8 Claims. (Cl. 209-72)

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This invention relates to a device for removing cans from a cold water bath and separating and aligning them in order to present them one after another in parallel relation for a further operation, such as for applying labels to the cans.

The invention involves dumping the cans into a plurality of chutes which initially align the cans end to end in each chute, followed by a power driven roller system which turns the cans consecutively upwardly under a spring tongue to bring the cans in more or less horizontal axial alignment, and to drop the cans down onto a track to permit the cans to roll by gravity to the subsequent operation station.

In the canning process, taking tomatoes for example, the tomatoes are placed in cans in the raw state, the cans sealed, and then taken, generally in wire baskets into the cooking retort where the sealed cans are brought up to and maintained at the predetermined cooking temperatures.

For a superior packing, as to taste and quality of firmness, the cans when taken from the cooking retorts are promptly dropped into a cold water bath to quickly reduce the temperature of the can contents so as to prevent further cooking, and also to avoid the flat sour conditions often arising where the cold water bath step is omitted. In taking the cans from the retort, the basket holding the cans is lifted, and turned over to dump the cans into the bath into a more or less scrambled arrangement.

In the present invention, the floor of the cold water bath tank has a belt conveyer running thereover, in the nature of a chain link belt so that water may pass therethrough, and this belt is carried up and out of the tank at one end thereof.

The present invention is concerned primarily with the reception of the cans at the discharge end of this belt, to sort the cans into a desired alignment for further operations through the apparatus embodying the invention.

A primary object of the invention is to speed up the operation of aligning the cans when discharged from the cold water bath, and to dry the cans between that tank and the next station, which generally is the labelling station.

A further primary object of the invention is to handle the cans in such manner that they will not be damaged or dented in the realigning procedure and the conveying of the aligned cans from the apparatus in question.

A further important object of the invention is to save labor and thus reduce the over-all cost of the complete canning and handling operations through the cannery.

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These and many other objects and advantages of the invention will become apparent to those versed in the art in the following description of one particular form of the invention as illustrated in the accompanying drawings, in which

Fig. 1 is a view in top plan of a structure embodying the invention;

Fig. 2 is a view in end elevation and partial section;

Fig. 3 is a view in longitudinal section on the line 3-3 in Fig. 2;

Fig. 4 is a view in transverse section on the line 4-4 in Fig. 3;

Fig. 5 is a view similar to that of Fig. 4, of a form modified therefrom;

Fig. 6 is a view in perspective of a form of chute modified from that shown in Figs. 4 and 5; and

Fig. 7 is a view in vertical central section through a pair of can conveying rollers.

A conveyer belt 10 delivers the sealed cans from the water bath above mentioned and drops them over an apron 11 onto a plurality of troughs or chutes 12, herein shown as five in number. These troughs 12 are supported by a frame work 13 to hold the troughs 12 in an inclined arrangement whereby the slope of the troughs will be sufficient to permit the cans to slide down the troughs under the influence of gravity. When the cans are dumped over the apron 11 and fall onto the troughs 12, the widths of the troughs are such that the cans will align themselves in the individual troughs to slide down the troughs end to end.

The framework 13 is carried by a stand 14, on which is mounted a motor 15 belt-connected to a jackshaft 16, in turn belt-connected to a shaft 18. The shaft 18 extends horizontally across the lower end of the frame 13 below the undersides of the troughs 12.

Spaced along the shaft 18 are a plurality of pairs of wheels 19, five of such pairs being shown, one pair for each trough 12. In each pair of wheels, wherein the wheels are designated as 19 and 19a, these wheels are spaced apart a distance such that the cans will ride thereover without any appreciable portion extending downwardly therebetween. However the spacing is such that the wheels 19 and 19a in each pair will hold the can passing thereover in the alignment in which it has been placed in coming down the trough 12 thereabove.

As will be noted in Fig. 3, the upper peripheral portions of these wheels 19 and 19a extend above the lowermost line of the trough 12 so that the can designated by the numeral 20, Fig. 3, will be

lifted by its lowermost end to approximately a horizontal position as it leaves the trough 12.

Mounted across an extension of the frame 13 forwardly of the wheels 19 and 19a is a hopper 21 extending the entire length across the ends of the troughs 12. The inside face of the forward wall 22 of the hopper 21 is vertically disposed and constitutes a solid wall entirely across the hopper. This wall 22 extends downwardly to at least terminate by a lower end at an inturned flange 23 which is in turn inclined from one end of the wall 22 to the other end, such as from the right-hand end to the left-hand end as viewed in Fig. 2.

The hopper 21 is provided with an inner wall 24 likewise vertically disposed in parallel relation to the forward wall 22, and spaced from that forward wall 22 a distance slightly greater than the over-all height of the can 20. The lower end portion of this wall 24 likewise terminates at an inturned flange 25, this flange 25 being in parallel alignment with the flange 23, and there being a full opening left between the two flanges. The upper end of the wall 24 has a portion 26 flaring rearwardly toward the wheels 19, to be directed substantially tangential thereto.

There is provided a vertically disposed plate 27 between the outer top end of the wall 22 and the uppermost ridge 28 existing between each of the adjacent troughs 12. These plates 27 are provided to prevent accidental turning of the cans 20 as they pass over the wheels 19, and 19a. There is a spring tongue 30 fixed by its forward end to the rail 31 which extends across the upper end of the wall 22. This spring tongue 30 is carried rearwardly substantially horizontally and to be aligned centrally of the trough 12 in each instance, there being one of these tongues 30 for each of the troughs 12.

The rear end of the tongue 30 has an upturned portion 32 under which the can 20 slides by gravity coming down the chute 12, and as the can end comes into contact with the wheels 19, 19a, the end of the can 20 is kicked upwardly forcibly against the tongue 30 and carried on thereunder whereby the can 20 is turned to have its axis disposed substantially horizontally, and maintained thereby being in contact with the underside of the tongue 30 even until the can travels by its rear end portion over the wheels 19, 19a. Immediately the can 20 leaves these wheels, the can, through the forward impetus given by these rapidly revolving wheels, is thrown by its forward end against the wall 22, and at the same time drops under the influence of gravity into some such position as indicated by the can at the position 20a. The speed rotation of the wheels 19, 19a is such that this action will be accomplished, but without any appreciable rebounding of the can from the wall 22.

Thus the can 20 upon striking the wall 22 is left to the influence of gravity, and it will drop downwardly between the walls 22 and 24 until the outer ends of the can will strike the lower flanges 23 and 25 to have the can in the position indicated by the numeral 20b. It is to be noted that the contact of the can with these flanges 23 and 25 is by the rolled over edges of the top and bottom closures of the can. This protects the wall of the can from any damage, since that wall does not come into contact with any member when it drops. These flanges 23 and 25 constitute then an inclined conveyor carrying the cans under the influence of gravity so that they may roll down those flanges to the next desired station.

There is mounted in spaced relation a plurality

of partial partition plates 33, the lower ends of these plates 33 being provided with a side turned portion 34, directed in the direction of the downwardly rolling cans. These cross partitions 33 are spaced, Fig. 2, to be centered between each pair of wheels 19, 19a so that the cans dropping from each of those pairs may fall between adjacent partitions, and if there be any tendency to roll sidewise in that falling, the lower end portion 34 will direct the cans downwardly in the direction of the downward incline of the flanges 23 and 25.

Should for any reason a can be misdirected or fall out of alignment, to have the end turn downwardly, the can will drop between the flanges 23 and 25 so that it will be removed automatically out of the paths of the properly aligned cans held by the flanges 23 and 25. The angle of incline of the flanges 23 and 25 is made to be such that the cans dropping thereon will roll very rapidly out from between the walls 22 and 24 so as to be removed from the paths of the cans dropping down from above.

Referring to Fig. 7, the wheels 19, 19a are duplicates one of another, and are preferably made to be quickly replaceable in respect to their peripheral portions which come into contact with the cans. One particular form of wheel is herein shown, to constitute a replaceable core 35 which is in the nature of a disk and is clamped between a male plate 36 and a female plate 37. The male plate 36 is adjustably secured along the shaft 18 by any suitable means, such as by a set screw 38 extending through the hub 39. The hub 39 extends along the shaft 18 to screw-threadedly receive thereon the plate 37 so that it may be brought up snugly against the face of the core 35. The core 35 has a greater diameter than is the diameter of both plates 36 and 37. The material of the core 35 is made to be such that it will have considerable frictional grip upon the smooth walled cans. A rubber material has been found to be quite satisfactory.

While the chutes 12 so far described have been illustrated in the drawings, Figs. 1-4, as constituting a solid wall trough or chute, these chutes may be made in different manners, such for example as indicated in Fig. 5, where the chute is shown as being made out of a corrugated metal so that the cans will be in line contact with various ribbed portions of the chute and thus come into quicker longitudinal alignment, one can after another. The development of the chutes may be even carried further as indicated in Fig. 6, where the chutes are shown in skeletonized form, being made out of a plurality of spaced rods 40 mounted in arcuate end members 41 and 42 to give and maintain the desired degree of curvature for each of the chutes. An advantage of the form shown in Fig. 6 is that the cans may be drained as they slide down the chutes, and water will thus be kept off of the wheels 19, 19a so that a better frictional grip will be maintained between those wheels and the cans.

A primary purpose of providing means for variably spacing apart the wheels 19 and 19a in each pair is to secure the required wheel grip on the cans 20 sufficient to kick the cans coming down the chutes up from their inclined positions to horizontal positions, to carry the cans in a sliding manner along under the spring tongues 30. The cans 20 ride on the wheels far enough to horizontally position the cans before they leave the wheels. In effect, a three point hold on the can is secured—one point on the wheels, and one point on each can end bearing up

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against the tongue 30 in each case. By spacing apart the wheels, the cans would be lowered relative to the tongues 30, and by spacing the wheels closer together, the cans will be raised.

Also this variable spacing of the wheels 19 and 19a permit the same structure to be used on different sizes of cans.

The pressure of the tongues 30 on the cans so is adjusted to be only that amount which will just hold the cans in the horizontal positions as the wheels carry the cans thereunder, and which will permit the wheels to supply sufficient can momentum to carry the cans to the hopper wall 22, to allow them to fall clear of the wheels.

While I have herein shown and described my invention in the one particular form it is obvious that mechanical changes may be made without departing from the spirit of the invention, and I therefore do not desire to be limited to that precise form beyond the limitations which may be imposed by the following claims.

I claim:

1. In a device for aligning and conveying cans, means for delivering cans to said device; a plurality of adjacent aligning chutes over which the cans are dumped from said means, each of said chutes being inclined downwardly from the zone of delivery thereto to permit the cans to slide thereunder under the influence of gravity, and each of said chutes having a floor generally concave in cross-section of a width to permit the cans to center themselves end to end, longitudinally of the chutes; a pair of friction wheels located at the lower end of each of said chutes, the wheels being spaced apart less than the diameter of the cans to cause the cans to center themselves therebetween; means for revolving said wheels to have their upper sides travel in the direction of the down-sliding cans; a hopper ahead of said wheels; an elastic tongue extending over said hopper and spaced above the tops of said wheels of each pair on a center line therebetween to engage frictionally the upper sides of the cans as said wheels grip the cans and carry them under the tongue; front and rear walls extending downwardly from said hopper, spaced apart a distance to receive said cans endwise and with no appreciable play therebetween; and conveyor means at lower portions of said walls onto which said cans may drop.

2. In a device for aligning and conveying cans, means for delivering cans to said device; a plurality of adjacent aligning chutes over which the cans are dumped from said means, each of said chutes being inclined downwardly from the zone of delivery thereto to permit the cans to slide thereunder under the influence of gravity, and each of said chutes having a floor generally concave in cross-section of a width to permit the cans to center themselves end to end, longitudinally of the chutes; a pair of friction wheels located at the lower end of each of said chutes, the wheels being spaced apart less than the diameter of the cans to cause the cans to center themselves therebetween; means for revolving said wheels to have their upper sides travel in the direction of the down-sliding cans; a hopper ahead of said wheels; an elastic tongue extending over said hopper and spaced above the tops of said wheels of each pair on a center line therebetween to engage frictionally the upper sides of the cans as said wheels grip the cans and carry them under the tongue; front and rear walls extending downwardly from said hopper, 75

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spaced apart a distance to receive said cans endwise and with no appreciable play therebetween; and conveyor means at lower portions of said walls onto which said cans may drop; said conveyor means comprising a pair of L-shaped tracks spaced apart a distance approximately equal to that between said walls, said track being inclined to cause the cans to roll downwardly therealong from under said hopper.

3. In a device for aligning and conveying cans, means for delivering cans to said device; a plurality of adjacent aligning chutes over which the cans are dumped from said means, each of said chutes being inclined downwardly from the zone of delivery thereto to permit the cans to slide thereunder under the influence of gravity, and each of said chutes having a floor generally concave in cross-section of a width to permit the cans to center themselves end to end, longitudinally of the chutes; a pair of friction wheels located at the lower end of each of said chutes, the wheels being spaced apart less than the diameter of the cans to cause the cans to center themselves therebetween; means for revolving said wheels to have their upper sides travel in the direction of the down-sliding cans; a hopper ahead of said wheels; an elastic tongue extending over said hopper and spaced above the tops of said wheels of each pair on a center line therebetween to engage frictionally the upper sides of the cans as said wheels grip the cans and carry them under the tongue; front and rear walls extending downwardly from said hopper, spaced apart a distance to receive said cans endwise and with no appreciable play therebetween; and conveyor means at lower portions of said walls onto which said cans may drop; said chutes having intervening walls of a height permitting a can dumped at the side of another can in one chute to roll from the under can laterally into the adjacent chute, whereby but one row of cans slides down each chute.

4. A device receiving cans in heterogeneous alignment, for aligning and conveying the cans in fixed arrangement comprising means for dumping misaligned cans into said device; a plurality of side-by-side chutes inclined downwardly from the dumping zone, each of said chutes having an arcuate floor of a width less than the lengths of the cans, a hopper across the lower ends of said chutes; a pair of friction wheels at the lower end of each chute, said wheels being mounted upon a shaft extending transversely of the chutes, the tops of the wheels being above said floors; means for turning said wheels; a spring tongue extending across the hopper to have an end portion positioned above and centered between the wheels of each of said pairs, said tongue having an under, smooth, surface, said end portion being normally spaced above said wheels a distance less than the diameter of said cans, whereby cans are forced along under said tongue in each instance by being gripped by the pair of wheels thereunder to lift and direct the cans into horizontally travelling directions; a can stop wall extending downwardly from a forward portion of said tongues, said wall being spaced from said wheels sufficiently to allow cans carried thereover to strike said wall and drop downwardly clear of said wheels; a rear wall depending from said hopper confining said cans to end to end alignment therebetween; and spaced tracks at lower portions of said walls, onto which tracks said cans may drop with their seamed end

portions respectively in rolling contact with the tracks.

5. A device receiving cans in heterogeneous alignment, for aligning and conveying the cans in fixed arrangement comprising means for dumping misaligned cans into said device; a plurality of side-by-side chutes inclined downwardly from the dumping zone, each of said chutes having an arcuate floor of a width less than the lengths of the cans, and a depth substantially equal to the diameter of the cans; a hopper across the lower ends of said chutes; a pair of friction wheels at the lower end of each chute, said wheels being mounted upon a shaft extending transversely of the chutes, the tops of the wheels being above said floors; means for turning said wheels; a spring tongue extending across the hopper to have an end portion positioned above and centered between the wheels of each of said pairs, said tongue having an under, smooth, straight approximately horizontally aligned surface, said end portion being normally spaced above said wheels a distance less than the diameter of said cans, whereby cans are forced along under said tongue in each instance by being gripped by the pair of wheels thereunder; a can stop wall extending downwardly from a forward portion of said tongues, said wall being spaced from said wheels sufficiently to allow cans carried thereover to strike said wall and drop downwardly clear of said wheels; a rear wall depending from said hopper confining said cans to end to end alignment therebetween; and spaced tracks at lower portions of said walls, onto which tracks said cans may drop with their end portions respectively in rolling contact with the tracks; longitudinal partitions between said walls aligned between said chutes, the lower portions of the partitions being inclined in common directions to direct falling cans laterally from immediately below said tongues.

6. A device receiving cans in heterogeneous alignment, for aligning and conveying the cans in fixed arrangement comprising means for dumping misaligned cans into said device; a plurality of side-by-side chutes inclined downwardly from the dumping zone, each of said chutes having an arcuate floor of a width less than the lengths of the cans, and a depth substantially equal to the diameter of the cans; a hopper across the lower ends of said chutes; a pair of friction wheels at the lower end of each chute, said wheels being mounted upon a shaft extending transversely of the chutes, the tops of the wheels being above said floors; means for turning said wheels away from said floors; a spring tongue extending across the hopper to have an end portion positioned above and centered between the wheels of each of said pairs, said tongue having an under smooth surface to guide said cans into horizontal travel, said end portion being normally spaced above said wheels a distance less than the diameter of said cans, whereby cans are forced along under said tongue in each instance by being gripped by the pair of wheels thereunder; a can stop wall extending downwardly from a forward portion of said

tongues, said wall being spaced from said wheels sufficiently to allow cans carried thereover to strike said wall and drop downwardly clear of said wheels; a rear wall depending from said hopper confining said cans to end to end alignment therebetween; and spaced tracks at lower portions of said walls, onto which tracks said cans may drop with their end portions respectively in rolling contact with the tracks; longitudinal partitions between said walls aligned between said chutes, the lower portions of the partitions being inclined in common directions to direct falling cans laterally from immediately below said tongues; said tracks having openings therebetween, through which openings misaligned cans may fall to be removed from the paths of aligned cans on said tracks.

7. In a device for aligning and conveying cans, means for delivering cans to said device; a plurality of adjacent aligning chutes over which the cans are dumped from said means, each of said chutes being inclined downwardly from the zone of delivery thereto to permit the cans to slide thereunder under the influence of gravity, and each of said chutes having a floor generally concave in cross-section of a width to permit the cans to center themselves end to end, longitudinally of the chutes; a pair of friction wheels located at the lower end of each of said chutes, the wheels being spaced apart less than the diameter of the cans to cause the cans to center themselves therebetween; means for revolving said wheels to have their upper sides travel in the direction of the down-sliding cans; a hopper ahead of said wheels; an elastic tongue extending over said hopper and spaced above the tops of said wheels of each pair on a center line therebetween to engage frictionally the upper sides of the cans as said wheels grip the cans and carry them under the tongue; front and rear walls extending downwardly from said hopper, spaced apart a distance to receive said cans endwise and with no appreciable play therebetween; and conveyor means at lower portions of said walls onto which said cans may drop; and means for variably spacing apart said wheels to vary the effective can spacing between said tongue and the wheel contacting zones on the cans.

8. In a can conveyer end delivery mechanism, a pair of rotatable members spaced apart less than the diameter of a can to be carried thereover; a conveyer leading to said wheels; and a spring tongue positioned to extend longitudinally of the direction of can travel and located substantially centrally of said wheels to be in the path of a can carried across said rotary members and yieldingly bear on the can to maintain the can in driving contact with those rotary members; and said tongue extending beyond said members in a linear manner in a direction of travel of the can from said members to guide the cans in initial travel over from said members.

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No references cited.