C. H. AYARS.

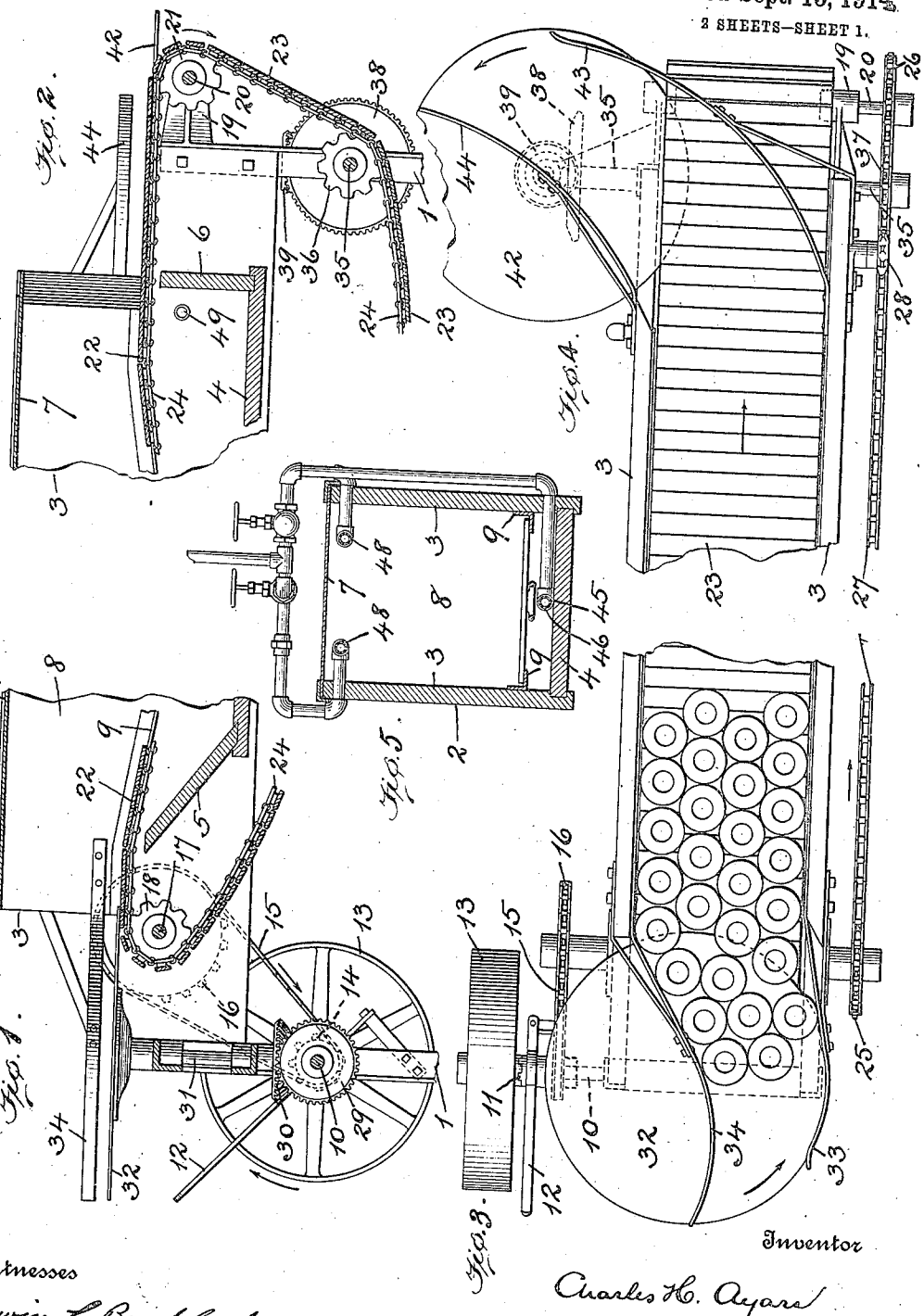
CANNING MACHINERY.

APPLICATION FILED OCT. 26, 1910.

1,110,983.

Patented Sept. 15, 1914.

2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 7.

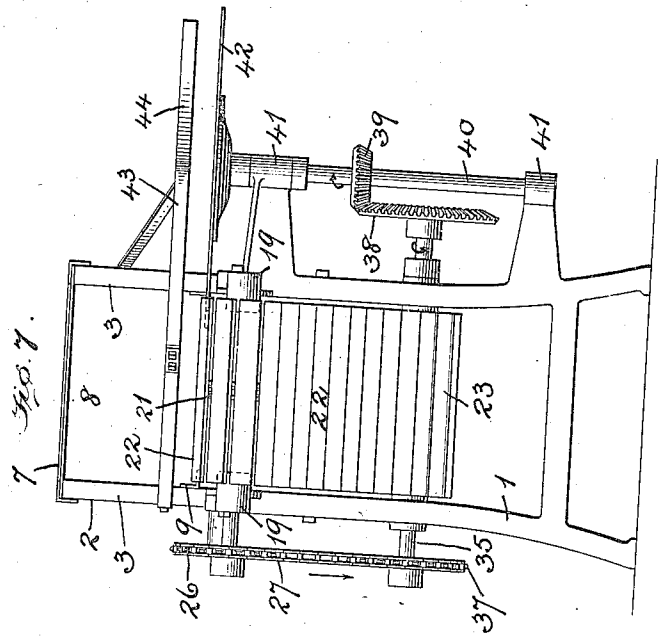


Fig. 6.

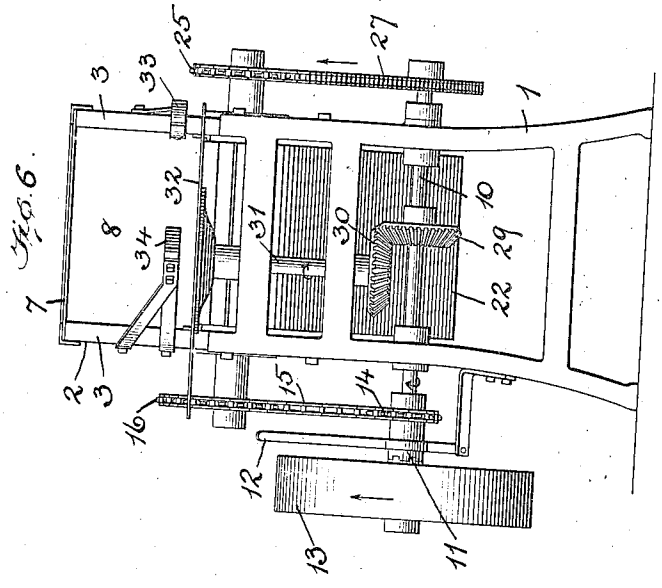
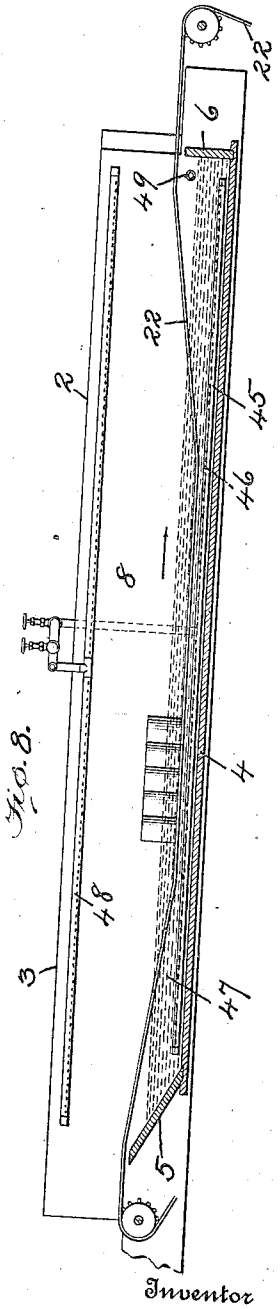


Fig. 8.



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CANNING MACHINERY.

1,110,983. Specification of Letters Patent. Patented Sept. 15, 1914.

Application filed October 26, 1910. Serial No. 589,128.

To all whom it may concern:

Be it known that I, CHARLES H. AYARS, citizen of the United States, residing at Salem, in the county of Salem and State of New Jersey, have invented certain new and useful Improvements in Canning Machinery, of which the following is a specification.

This invention relates to an improved machine for treating canned goods and has particular reference to what is known in the canning art as an exhauster, in that its function is to convey filled cans through a heated zone to heat the contents therein and thus exhaust the air from the cans to prepare them for capping.

In the operation of canning, it is the best and most economical practice to arrange the several machines such as the cooker, filler, exhauster and capper, etc., used in the various steps so that the canning operation may be as nearly continuous as possible, and with few hand-transferred operations of the cans from one machine to another. In most of the steps in canning the cans are operated upon while traveling in a single file, but there are periods in the entire operation where the advance movement of the cans in their forward travel must be much reduced in order to give sufficient time, (particularly where space cannot be had) to perform some particular operation, consequently at such point the cans will obviously accumulate because they will be delivered faster than they can be handled. One of the points where this accumulation of cans takes place is at the exhauster, where the filled cans are passed slowly through the heated zone to heat the contents and thereby expel the air to make the canned goods ready for the capping machine, where the cans are again operated on while traveling in a single file.

One object therefore of the present invention is to provide a machine which may be interposed at the point where the travel of the cans must be reduced for any purpose so that the cans entering more rapidly in single file may be so disposed and taken care of, that they will not interfere with the operation on or the advancement of cans at the rear.

Another object is to provide means whereby the cans upon arriving at the end of the reduced speed period may be engaged rapidly and shifted into a single file again for the next and succeeding operations.

Another object of the invention is to provide an improved feed and discharge mechanism, in combination with a carrier that operates between them, whereby the cans may be fed to and packed on the carrier during their slow passage through the machine for any purpose and then arranged in single file upon leaving the carrier.

Another object is to provide a machine including a carrier with a capacity sufficiently great to accommodate cans side-by-side in the direction of its path of travel, and to provide a feed device that is capable of crowding cans onto the carrier and thereby arrange the cans on the carrier in other than a single row, and to also provide means for removing the cans from the carrier and again arranging them in a single row.

A further object of the invention is to combine a can feed device and carrier or conveyer which latter is of sufficient width to sustain a plurality of cans on their ends in a crosswise direction and to so arrange the feed device that the cans may be automatically fed onto the conveyer to practically fill the latter whereby the capacity of the machine may be materially increased and maintained.

A still further object of the invention is to provide an improved construction of the so-called exhauster whereby to enable the carrier to move the filled cans through hot water and steam to heat the contents of the cans.

With these and other objects in view and all the advantages arising the invention is illustrated in the accompanying drawings in which,—

Figures 1 and 2 show enlarged vertical sectional views through the feed and discharge ends respectively of the machine. Figs. 3 and 4 illustrate top plan views of the same with the cover of the heating chamber removed to show the carrier. Fig. 5 shows a view in vertical cross-section through the heating chamber showing the supply pipes therein. Fig. 6 illustrates an end elevation of the feed-in end of the machine. Fig. 7 illustrates a similar view of the discharge end of the machine, and Fig. 8 a diagrammatic longitudinal section on a reduced scale through the heating chamber of the machine.

In the drawings the numeral, 1, designates suitable legs or end supports which sustain a horizontal body, 2, of rectangular shape in cross-section. The body comprises two vertical side-walls, 3, which extend from one support to the other; a bottom, 4, and end walls, 5, and, 6, respectively which extend upwardly for a short distance only from the bottom whereby to form a horizontal trough-like receptacle between the end supports. A cover, 7, extends across and is sustained from the side walls to form a heating chamber, 8, between said side walls, the bottom and said cover, as will presently be more described.

By reference to Figs. 1, 5 and 7 it will be seen that the side walls, 3, carry at their inner sides suitable longitudinally-extending side supports, 9, which in the present instance are formed of angle bars. These side supports extend longitudinally through the heating chamber, 8, and dip down toward the bottom, 4, between their ends and their intermediate portions extend substantially parallel with the bottom as may be seen by reference to Fig. 5.

The driving mechanism in the present instance is located at the feed-in end of the machine and consists of a horizontal shaft, 10, which has bearing in the support, 1, and which has a clutch, 11, near one end with a lever, 12, for operating the same to throw said shaft into and out of operative connection with a drive pulley, 13. A sprocket, 14, is carried on said horizontal shaft and drives a chain, 15, which extends upwardly and around a comparatively large sprocket, 16, on the outer end of a horizontal carrier shaft, 17. This carrier shaft has bearing in and is sustained by the side walls of the heating chamber, and between said walls is provided with a sprocket wheel, 18, for a purpose presently to be described.

At the discharge end, the support, 1, sustains two bracket bearings, 19, which carry a horizontal shaft, 20, on which latter a sprocket wheel, 21, is mounted. This sprocket wheel, 21, together with the wheel, 18, on the carrier shaft, 17, sustains the upper stretch of an endless conveyer or carrier, 22, which comprises a series of slat-like plates, 23, flexibly connected by links, 24. The slat plates of the carrier are of such length that their ends will rest upon the angle-iron bar side supports, 9, on the interior of the heating chamber, 8,—the upper stretch of the conveyer being so adjusted about the sprockets, 18, and, 21, that its intermediate portion will sag while passing through the said chamber and will rest upon and follow the direction of the said side supports. In order to maintain the upper stretch of the conveyer or carrier in a sagging condition between the horizontal shafts, 17, and, 20, I provide a sprocket wheel, 25, on the end of the former shaft and another sprocket, 26, on the latter shaft. These two sprockets are of the same diameter and are connected by a sprocket chain, 27, which is driven from the sprocket, 25, on shaft, 17, and by this means both shafts, 17, and, 20, are positively driven together and thus the slack in the upper stretch of the conveyer or carrier will be maintained.

An idler, 28, is provided over the upper stretch of the chain, 27, for tightening the latter.

At the feed-in end of the machine the horizontal shaft, 10, is provided with a beveled gear, 29, which meshes with and drives a similar gear, 30, on the lower end of a vertical shaft, 31, that has bearing in the end support, 1. The upper end of this vertical shaft, 31, carries a horizontal feed plate, disk or conveyer, 32, which projects over the end of the carrier, 22, as clearly shown in Figs. 1 and 3, so that filled cans may be deposited or fed onto said plate or disk and transferred from the same onto the endless carrier.

It has heretofore been explained that one of the objects of the invention is to provide a construction whereby the filled cans will be received in a single file and then crowded onto the carrier in a plurality of crosswise and longitudinal rows so as to practically fill the latter with cans. To accomplish this the cans in single file are fed more rapidly to the carrier than the latter can carry them along in single file consequently, the oncoming cans push and crowd and succeed in spreading crosswise of the carrier while the latter moves them forward more slowly and the width of the carrier is sufficient to accommodate the cans.

To properly heat the cans and their contents they must be moved slowly through the heating chamber in order to allow them to remain in the heated zone a sufficient length of time because it is not possible in many instances to give sufficient floor space to a machine simply to allow the cans to remain therein a sufficient length of time. To take care of the cans as fast as they are ordinarily presented in the canning operation I have found the cans must be moved toward and deposited somewhat more rapidly onto the carrier than the latter will move them forward, otherwise they would simply be moved along in a single file and I accomplish this by rotating the feed plate, disk or conveyer, 32, fast enough to crowd the cans onto the carrier and provide for the crowding by increasing the width of the carrier so the latter will accommodate a plurality of rows of cans. The cans may be received by or deposited on the plate or disk in any preferred manner either in helter skelter fashion or in single file as they come from

some other machine, and as the rotation of the disk is comparatively rapid, the cans are carried around by the disk between the two stationary arms, 33, and, 34, respectively which are sustained from the opposite side walls of the heating chamber so that their ends may project horizontally over the disk or plate and form a throat or guideway to direct the cans laterally over the revolving disk toward that portion of the disk-edge that overlies the slowly moving carrier and as the cans crowd together the disk simply slips beneath them. Obviously the cans will be carried around with the disk until they are brought against the arm, 34, or against other cans that are held by said arm whereupon the disk will merely slide beneath them and the action of arm, 34, is to direct cans toward the periphery of the disk where their overhanging bottom portions may be engaged by the slowly advancing carrier, 22, which will draw them off the disk and convey them away. It will therefore be seen that if the feed of the cans to the disk is rapid and maintained the cans will constantly be crowded toward the periphery of the disk by the curved arm, 34, and as the disk feeds the cans rapidly and the conveyer advances them slowly, the cans at the rear will crowd and push the cans in front causing them to spread over the carrier between the two side walls and consequently the carrier may be filled with cans substantially as shown in Fig. 3.

At the discharge end of the machine, and below the sprocket, 26, the support, 1, carries a lower horizontal shaft, 35, which has a central carrier sprocket, 36, and a drive sprocket, 37, at its outer end. The carrier sprocket, 36, serves as a guide for the carrier while the sprocket, 37, receives the drive chain, 27, and is driven thereby,—thus it will be seen that shafts, 17, 20, and, 35, are all positively driven by the drive chain, 27, so that the upper stretch of the carrier or conveyer, 22, will travel from sprocket, 18, toward sprocket, 21, as indicated by the darts in the drawings.

The shaft, 35, is positioned at the discharge end of the machine and one end thereof carries a beveled gear, 38, which meshes with and drives a beveled pinion, 39, which is carried on a vertical shaft, 40, which latter has bearing in suitable brackets or arms, 41, that project horizontally from the support, 1. The upper end of this vertical shaft, 40, carries a disk, head or table, 42, which by referring to Figs. 4 and 7 of the drawings it will be seen has position so that a portion of its periphery will project under the discharge-end of the carrier, 22, from one side of the latter. The upper horizontal surface of the disk or table, 42, has position immediately under the upper stretch of the carrier and is so located that a portion only of its circular edge will underlap the carrier, 22. The function of the disk is to receive the filled cans after the carrier has conveyed them slowly through the heating chamber and which are delivered thereon by the carrier so they may be arranged in a single file for the action of the next machine in the canning operation. To aid in doing this I provide suitable stationary curved arms, 43, and, 44, respectively, the arm, 43, being secured to the wall of the heating chamber at the far side of the carrier and projecting horizontally across the latter and then over the disk or table, 42, as clearly seen in Fig. 4, of the drawing. The arm, 44, has one end secured to the other wall of the heating chamber and curves outwardly therefrom and also over the delivery disk or table, 42. By means of this arrangement of arms, it will be noted that a passageway is formed between the arms which extends across the carrier and over the disk or table,—the table serving as a conveyer to receive the cans directed laterally by the arms and move them away from the carrier. When the delivery disk or table, 42, receives the cans from the slowly moving carrier, it, because of its comparatively rapid revolution or movement, will promptly convey them in rapid succession between the arms, 43, and, 44, and discharge them adjacent to the end of arm, 44, in single file, at which point they may be successively engaged by a chain conveyor of the well known form which will convey them to the successive machines where they may be wiped, capped, tipped and finally discharged. After the filled cans are deposited on the carrier, 22, by the feed disk or table, 32, the carrier moves them forward slowly into the heating chamber where both the carrier and the filled cans thereon are lowered as they advance.

A steam pipe, 45, is provided in the heating chamber below the carrier and in the present instance said pipe extends longitudinally of the chamber and is provided with perforations, 46, for the escape of steam.

Water, 47, is provided in the bottom of the chamber and is of sufficient depth to cover the horizontal stretch of the carrier and to extend about half way up the wall of the cans. This water is kept hot by means of the steam that escapes though the perforations, 46, in the steam pipe, 45, which is submerged. In addition to this latter pipe the heating chamber is further provided with one or more steam pipes, 48, above the cans through which steam may be delivered into the chamber above the cans. By means of these pipes the water and the chamber are kept hot and the materials in the cans are heated sufficiently during their passage through the chamber to accomplish the desired result. An overflow pipe, 49, will

carry off the water when the latter reaches a predetermined height.

It will thus be seen that the filled cans are fed onto the carrier by the disk, 32, and arranged in a plurality of rows which rows of cans are then moved slowly by the carrier into and through the heating chamber where they are heated. The cans are then delivered to the discharge disk or table, 42, which rapidly shifts them and arranges them in single file for further operation in the canning process.

It is to be understood that if the feed of cans to the feeding disk or table is maintained that the carrier will be practically crowded with cans between its longitudinal side edges and thus the cans will be arranged on the carrier in a plurality of continuous rows, but if an interruption in the feed of the cans to the disk takes place, the arrangement of the cans may still be in a plurality of rows on the carrier although the cans may be somewhat spaced apart. It is therefore to be understood that the expressions hereinafter used in the claims in defining the arrangement of the cans on the carrier by the feed means, has reference to the placing of the cans other than in a single file on the carrier because the invention contemplates receiving the cans in a single file, doubling them up into side-by-side positions on the carrier and then delivering them in single file.

Having thus described my invention what I claim and desire to secure by Letters Patent is,—

1. In a canning machine the combination with a straight casing having a heating chamber, of a straight endless carrier extending through the casing and of sufficient width to accommodate a plurality of cans on their ends; means for moving the carrier through the casing; means for crowding cans onto the said carrier by pushing those at the rear against those in front to spread the cans crosswise of the straight carrier and means for removing the spread cans from the carrier and arranging all of them in one single file.

2. In a canning machine the combination with a casing having a heating chamber, of a straight endless carrier extending through the chamber and of sufficient width to accommodate a plurality of cans on their ends; means for moving the carrier through the chamber; means movable in a direction transverse to the movement of said straight carrier for crowding cans onto the latter by pushing those at the front by those at the rear to spread the cans over the said straight carrier, and means for removing the spread cans from the straight carrier and arranging all of them in one single file.

3. In a canning machine the combination with a casing having a heating chamber, of a straight endless carrier extending through the chamber and of sufficient width to accommodate a plurality of cans on their ends; means for moving the carrier through the chamber; means movable in a direction transverse to the movement of said straight carrier for crowding cans onto the latter by pushing those at the front by those at the rear to spread the cans over the said straight carrier and means also movable in a direction transverse to the movement of said straight carrier for removing the spread cans from the latter and arranging them all in one single file.

4. In a canning machine the combination with a casing having a heating chamber, of a straight endless carrier extending through the chamber and of sufficient width to accommodate a plurality of cans on their ends; means for moving the carrier through the chamber; rotatable means for crowding filled cans onto the said straight carrier by pushing those cans at the front by those at the rear to spread the cans crosswise of the straight carrier and means for removing the spread cans from the straight carrier.

5. In a canning machine the combination with a casing having a heating chamber, of a straight endless carrier extending through the chamber and of sufficient width to accommodate a plurality of cans on their ends; means for moving the carrier through the chamber; rotatable means for crowding filled cans onto the said straight carrier by pushing those cans at the front by those at the rear to spread the cans crosswise of the straight carrier and rotatable means for removing the spread cans from the straight carrier and arranging all of them in one single file.

6. In a canning machine the combination with a casing having a heating chamber, of a straight endless carrier extending through the chamber and of sufficient width to accommodate a plurality of cans on ther ends; means for moving the carrier through the chamber; a rotary table projecting over the carrier to receive and crowd the cans onto the carrier and spread the same crosswise of the carrier from one side to the other; a rotary table having its periphery extending beneath the carrier to receive the cans from the latter and arrange them in a single file, and means for directing the cans from the carrier onto said latter table.

7. In a canning machine the combination with a straight endless carrier of sufficient width to accommodate a plurality of cans on their ends, of means for moving the carrier; a casing extending along the straight carrier and covering the same whereby to form a heating chamber about the carrier; means at one end of the casing for crowding cans onto the carrier by pushing those at the rear against those at the front to spread the cans

crosswise of the straight carrier; means at the other end of the casing for removing the spread cans and arranging all of them in one single file and means for heating the cans during their passage through the casing.

8. In a canning machine the combination with a longitudinal casing having a heating chamber and a water receptacle therein, of an endless flexible carrier of sufficient width to accommodate a plurality of cans on their ends said carrier extending through the heating chamber of the said casing; means at opposite ends of the casing for driving said carrier and to maintain a slack in that portion of the carrier that is passing through the heating chamber; means for heating the chamber and water therein; means adjacent to one end of the casing for crowding cans onto the carrier by pushing those cans at the rear against the cans in front to effect a spreading of the cans crosswise of the straight carrier and means adjacent to the other end of the casing for removing the spread cans from the carrier and arranging them in one single file.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES H. AYARS.

Witnesses:

I. OAKFORD ACTON,

OAKFORD W. ACTON.