N. H. FOOKS.

CAN FEEDING MEANS.

APPLICATION FILED DEC. 13, 1920.

1,402,487. Patented Jan. 3, 1922.

2 SHEETS—SHEET 1.

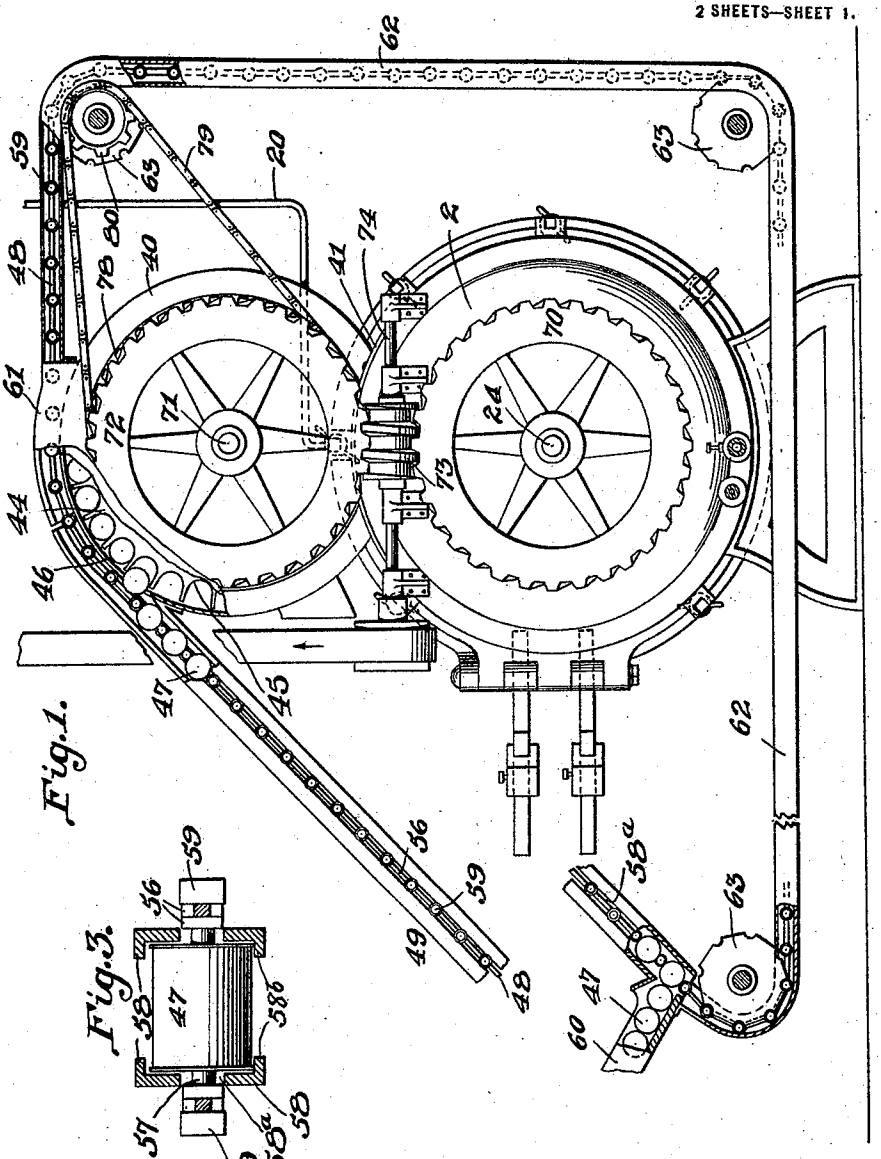


Fig. 1.

Fig. 3.

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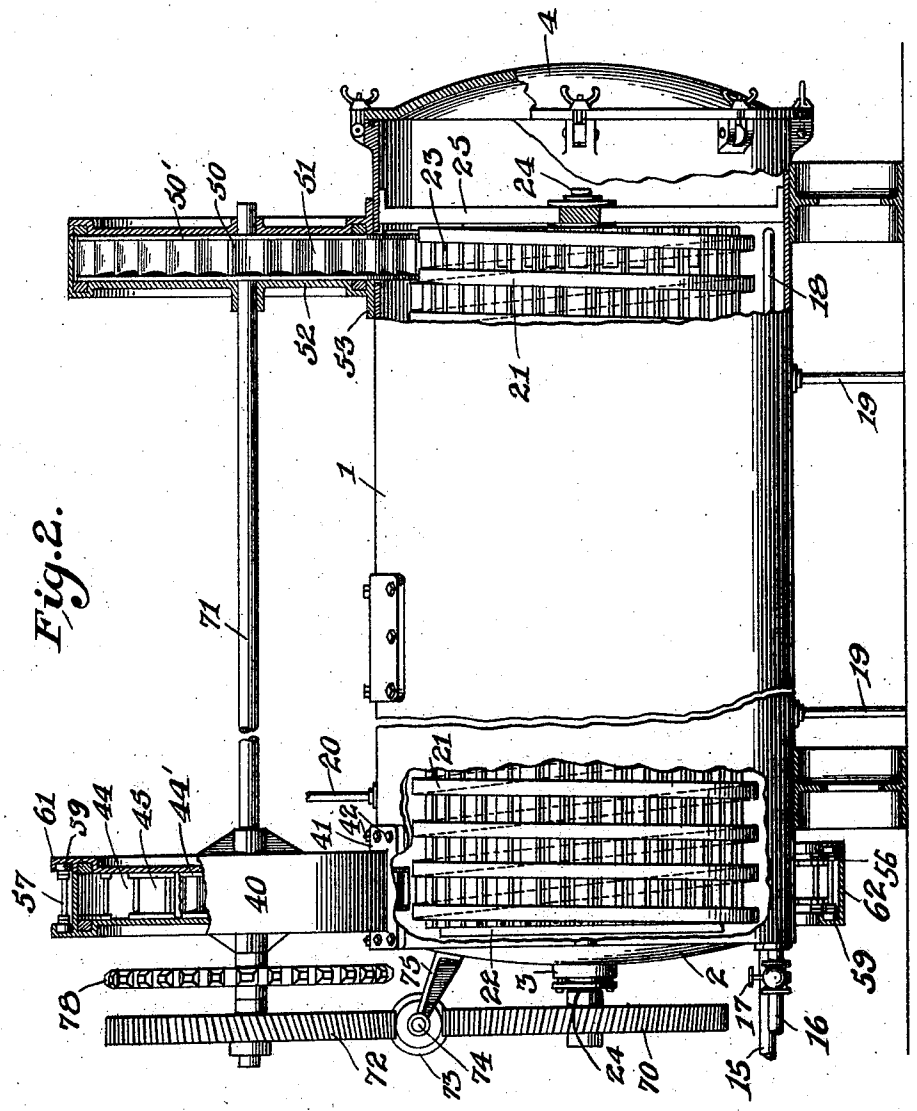
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2 SHEETS—SHEET 2.

Fig. 2.



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CAN-FEEDING MEANS.

1,402,487. Specification of Letters Patent. Patented Jan. 3, 1922.

Original application filed December 22, 1919, Serial No. 346,578. Divided and this application filed December 13, 1920. Serial No. 430,353.

To all whom it may concern:

Be it known that I, NELSON H. FOOKS, a citizen of the United States, residing at Preston, in the county of Caroline and State of Maryland, have invented certain new and useful Improvements in Can-Feeding Means; and I do hereby declare the following to be a full, clear, and exact description of invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This application is a division of my application Serial No. 346,578, filed December 22nd, 1919, now Patent 1,363,103, December 21, 1920, to which reference is made for a full description of an apparatus with which the means claimed herein may be used.

The object of this invention is to feed cans or similar bodies to a pocketed carrier in continuous rapid motion and place said bodies successively in successive pockets of said carrier with precision and speed.

The invention consists in the combination of a carrier having received pockets, with a chute or other guide delivering thereto, and a conveyer, having flights spaced in accordance with the spacing of said pockets, adapted and arranged to move said bodies along the guide and direct them into the pockets, said conveyer and carrier having the object receiving spaces between the flights, and the pockets, in accurate registration, and means for moving said carrier and said conveyer in synchronism in the same direction.

In the accompanying drawings in which similar reference characters indicate corresponding parts throughout the several views:

Figure 1 is an end elevation of an apparatus showing one embodiment of the invention applied thereto;

Figure 2 is a side elevation partly in section;

Figure 3 is a cross section on an enlarged scale through a chute and conveyer in accordance with this invention.

The invention is illustrated in connection with a retort or fluid tight vessel adapted for cooking substances in sealed cans. The first part of the following description relates to apparatus more fully described in the application of which this is a division, enough of said apparatus having been illustrated to explain the application thereto of the means to which the claims of this application are confined.

Referring to said drawings, 1 indicates a cylindrical shell of boiler iron, having a permanently closed head 2 at one end and a movable head 4 at the other, the head 2 being perforated to receive a shaft 24 which is packed by means of a stuffing box 3. The opposite end of the shaft 24 is journaled in a spider or hanger 25 secured within the shell 1. For the purpose of admitting water or other liquid conveniently and quickly into the retort, a pipe 15 of adequate size may be tapped into the lower portion of the head 2, and the passage of the liquid through said pipe 15 may be controlled by a suitable valve (not shown). In order to heat the water, or other liquid, hot gas or steam may be admitted through the pipe 16, provided with a controlling valve 17; and the pipe 16 may continue into a pipe or coil 18 within the retort. The pipe or coil 18 may have perforations in it to emit steam into the water, if water be used as the cooking medium and steam as the heating fluid for heating it. In order to empty the retort quickly of liquid and steam two pipes 19 of ample dimensions are tapped into the lower part of the shell 1, and may be provided with suitable control valves and united in a suitable discharge main (not shown). Air or other fixed gas may be conducted into the retort by a suitable gas pipe 20 entering the shell at any convenient point, but should preferably terminate within the retort at a point above the normal liquid level. The pipe 20 leads to the retort from an air compressor or any suitable supply of gas held under a pressure adequate for the purpose, as is well understood and therefore not shown.

As a preferred means for conveying cans or other objects through the heating bath, over the longest practicable path in the cooking chamber or any selected fraction thereof, a spiral guide 21 is fixed within the shell 1, and a rotary rack 22 with longitudinal flights or guide ribs 23 on its perimeter is mounted within the turns of the spiral guide and concentric with them, the said rack being secured to spiders which are keyed or otherwise secured to the said shaft 24. Cans or the like entered at one

end between two of the ribs 23 are rolled around the spirals of the guideway when the rack rotates, the spirals pushing the cans endwise between the guide ribs in the manner of a screw and nut, it being understood that the flights are composed of angle irons, radially disposed flanges serving to form guiding ribs 23 to prevent the cans from moving circumferentially with respect to the rack and flanges at right angles thereto serving as floors to sustain the cans in their movement endwise and prevent them from dropping or being pushed toward the center of the rack.

The spiral guide 21 is formed of a T-sectioned metallic shape bent into a spiral coil with the flanges on the convex side constituting, as it were, a single threaded screw, the insides of adjacent overlying flanges constituting the surfaces on which the cans or other bodies are rolled or moved spirally. The said T-irons 21 may be suitably anchored to the shell by brackets or otherwise. One or more charging ports are provided at the top of the retort and also a discharging port preferably in line therewith parallel with the axis.

A cylindrical casing 40, having an opening registering with a charging port is provided with a curved flange 41 which is bolted to the casing over a charging port by means of bolts and nuts 42. A packing gasket may be clamped between the flange 41 and the shell 1 in order to prevent the escape of air or other fluid through the joint. Within the casing 40 a pocketed carrier disk 44 is rotatably mounted. The said disk 44 is provided with a number of pockets 45 in its periphery, equally spaced apart and of a depth equal to or slightly greater than the diameter of the cans or other objects to be fed into the retort. The pockets are so designed that the objects will fit neatly within them. The width of the pockets circumferentially is substantially the same as the width of the guideway between the guide ribs or flights 23 of the rack 22. The diameter of the pocketed disk 44 may be substantially the same as that of the rack 22, and the number of pockets 45 equal to the number of guideways in said rack 22. The disk 44 has a machined plate 44′ secured to each face, and is fitted within the casing 40 with a piston-tight fit to prevent the escape of compressed air from the retort except that which will be trapped in the pockets as the carrier disk rotates. Casing 40 is provided with entrance opening 46 for the cans or other bodies 47 to be treated. This opening preferably extends circumferentially of the casing a distance equal to the circumferential width of a plurality of pockets.

After treatment within the retort the cans or other objects are received by a carrier disk 50 faced with plates 50′ like the disk 44. Said disk 50 is preferably of the same diameter and furnished with the same number of pockets 51, as disk 44, said disk 50 being fitted in a casing 52 so as to constitute a discharging air lock or valve adapted to prevent the escape of any air or other fluid through the casing except that which will be trapped in the pockets 51. A flange 53 projecting from the casing 52 is bolted to the shell 1 in the same manner as the flange 41. Suitable means are provided whereby the cans may be discharged from the rotary rack 22 and received in the pockets of the disk 50 and discharged from said disk through an opening in casing 52, as described and illustrated in the application of which this is a division. Carrier disks 44 and 50 are both fixed to shaft 71 and rotate in unison.

The particular invention to which this application relates consists in the means for feeding the cans to and placing them in the pockets 45 of the charging carrier or valve 44.

The said feeding means comprises in general an endless chain conveyer 48, along which the carrier moves the cans or like objects and drops them one by one, successively, into the successive pockets of the disk 44, the said conveyer and the said disks travelling at exactly the same linear speed,— both being driven directly from the same rotary member,—in the embodiment illustrated, shaft 71.

The said chain carrier 48 consists of two series of links 56 of suitable length pivoted together by cross pins 57 which are spaced from each other a distance equal to the circumferential width of a pocket 45 and constitute object engaging means providing an object receiving space between them. The pins are of a length determined by the length of said bodies. The conveyer 48 moves the objects along a fixed guide, comprising a section 49 preferably composed of four angle bars 58 spaced from each other as shown in Figure 3 so as to define in cross section a rectangle, and the ends of the pins 57 project through the spaces or slots 58ª between the upper and under angle bars 58, and the links 56 are connected together on the pins 57 outside of the chute. The extremities of the pins 57 are provided with rollers 59 for a purpose presently to be stated.

As one means for delivering the cans to the guide-way or chute 49 there is shown a gravity magazine or chute 60 adapted to direct objects through a suitable opening in the upper side of the guide 49 so that the cans, arranged one on top of the other in chute 60, will feed by gravity through said opening and drop one by one into the spaces between the flights of the travelling conveyer 48.

The guide 49 is disposed on an upward

incline from the gravity chute 60 and at a tangent to the disk 44, said magazine 60 delivering to the lower end of the guide 49.

The under flanges 58b of the lower guide bars 58 are narrow and spaced apart such a distance that a body 47, such as a cylindrical can, will fall between them should it by accident enter the chute 49 endwise between two pins or flights 57 of the conveyer chain 48. Thus the chute 49 serves as a selector to reject cans delivered to it in wrong position by accident or to reject any objects of small dimensions that may happen to get into the chute 60.

The guide or chute 49 has its under flanges eliminated where the guide registers with the described cut-away portion of the casing 40 in order to permit entrance of the cans into the pockets 44. After the carrier chain 48 leaves the guide 49 beyond the delivering opening in the casing 40 it passes through a box casing 61 formed on or attached to the valve casing 40 and through several sections of box casing 62, as illustrated in the drawings, around three guiding sprocket wheels 63. The rollers 59 serve to guide the conveyer chain in its passage through the box casings 61 and 62.

In order to operate the mechanism described in the particular form of the invention illustrated, a worm wheel 70 is keyed to the shaft 24 for rotating the rack 22, and a worm wheel 72 is keyed to the shaft 71, said worm wheels 70 and 72 being of equal diameter. A worm 73 keyed to a main driving shaft 74, which is supported by a bracket 75, drives the worm wheels 70 and 72 in absolute synchronism and in the appropriate directions. The pockets of the receiving and discharge valves being of equal circumferential width to that of the guideways in the guides 23 and the two carrier disks being of equal diameter to the rack 22, it is clear that the peripheries of said disks and racks will move with absolute synchronism and the cans will be delivered from the charging pocket to the rack and from the rack to the discharging disk with accuracy, as pockets and guide spaces between the racks continue in registration throughout the movement of the mechanism.

In order that the conveyer 48 may be moved in absolute synchronism with the disk 44 and the spaces between the pins or flights be in registration with the pockets 45 of said receiving valve, the pins being spaced apart a distance equal to the spacing of the divisions separating the pockets as stated, the conveyer 48 is driven by a sprocket wheel 78 keyed to the shaft 71 and a sprocket chain 79 driven from said sprocket wheel 78 engages a sprocket wheel 80, rigid with a conveyer sprocket wheel 63.

The means sought to be claimed in this application consists of the combination of a pocketed carrier, with the guide and conveyer adapted to place cans or the like successively in successive pockets of the carrier. In continuous cookers high speed operation is an important factor in commercial success. Extraordinary precautions must be taken, however, to place the cans accurately in the pockets in order to avoid jamming of the cans and consequent stoppage of machinery. By the construction shown cans are moved to the pocketed charging carrier at the same rate of speed that the carrier moves, are held successively in exact registration with successive pockets and dropped one by one into the pockets. The conveyer chain is extended an appreciable distance circumferentially of the pocketed charging carrier so that several pockets are simultaneously in registration with several can-spaces in the conveyer. This affords abundant time for the can to move from the can-spaces in the conveyer well into the registering pockets before the conveyer moves away tangentially from the carrier.

Having described my invention in such manner as to enable those skilled in the art to which it appertains to make and use the same, what I claim and desire to secure by Letters Patent of the United States is:

1. In mechanism of the class described, a carrier having object receiving pockets, a conveyer having object engaging means providing object receiving spaces corresponding with said pockets, means for moving said carrier and conveyer to cause said object engaging means and pockets to travel simultaneously in the same direction at the same linear speed, said carrier and conveyer being relatively arranged so that successive object receiving spaces of the conveyer successively register with successive pockets of the carrier and transfer said objects from the conveyer to the carrier.

2. In mechanism of the class described, a disk-like carrier having object receiving pockets in its periphery, a conveyer having object engaging means providing object receiving spaces corresponding with said pockets, means for moving said carrier and said conveyer so as to cause said object engaging means and said pockets to travel simultaneously in the same direction at the same linear speed, said carrier and conveyer being relatively arranged so that the conveyer delivers objects tangentially with respect to the carrier, and successive object engaging spaces of the conveyer successively register with successive pockets of the carrier and transfer said objects from the conveyer to the carrier.

3. In a mechanism of the class described, a disk-like carrier having object receiving pockets in its periphery, a conveyer having object engaging means providing object receiving spaces corresponding with said pock-

cts, means for moving said carrier and said conveyer, so as to cause said object engaging means and said pockets to travel simultaneously in the same direction at the same linear speed, said carrier and conveyer being relatively arranged so that a portion of the conveyer moves in an arc concentric with said pockets, and presents a plurality of its object receiving spaces in registration simultaneously with a corresponding number of pockets, so as to successively transfer objects from the conveyer to successive pockets of the carrier, and maintain each object receiving space in registration with its corresponding pocket throughout a distance equal to the peripheral extent of a plurality of pockets.

4. In a mechanism of the class described, a carrier having object receiving pockets, a fixed guide having a discharge point over the path of movement of said pockets and adjacent thereto, a conveyer having flights adapted to engage objects supported by the guide and cause them to travel along said guide toward its discharge point, said flights being spaced to form object receiving spaces corresponding with said pockets, and arranged to register therewith, and means for moving said carrier and conveyer to cause said pockets and flights to travel simultaneously in the same direction at the same linear speed.

5. In a mechanism of the class described, a disk-like carrier having object receiving pockets on its periphery, a fixed guide disposed tangentially of said carrier and adapted to discharge objects to said carrier, a flexible conveyer having flights adapted to travel parallel with said guide and engage objects supported by the guide and cause them to travel toward the discharge point, said flights being spaced to form object receiving spaces corresponding with said pockets and arranged to register therewith, and means to guide said conveyer in an arcuate path concentric with the peripheral pockets beyond the discharge point of said guide.

6. In a mechanism of the class described, a disk-like carrier having object receiving pockets on its periphery, a fixed guide having bottom, top and sides, said guide comprising a section arranged tangential to the carrier adapted to direct objects thereto, and a bottomless section, in continuation thereof, arcuate in form and concentric with the periphery of the carrier, a flexible conveyer having flights moving in said guide and spaced to form object receiving spaces corresponding with said pockets, and arranged to register therewith, and means for causing said carrier and conveyer to travel simultaneously in the same direction at the same rate of speed.

7. In a mechanism of the class described, a disk-like carrier having object receiving pockets in its periphery, an endless conveyer having object engaging means providing object receiving spaces corresponding to said pockets, said conveyer having its delivery ply extending adjacent the pockets of said carrier and the object receiving spaces disposed so as to register with said pockets, and driving gear between said carrier and said conveyer adapted to compel the periphery of said carrier and said conveyer to move at the same linear speed.

8. In mechanism of the class described, an object guide having a longitudinal slot in its bottom, a conveyer having cross flights forming object receiving spaces arranged to move over said slotted bottom, and a gravity feeding magazine arranged to feed objects to said guide between said flights.

9. In mechanism of the class described, an object guide composed of four spaced angle bars, a conveyer chain having one ply traveling along said guide, said chain having spaced cross pins serving as object engaging flights, said pins projecting through the lateral spaces of the guide, the projecting portions of the pins thus serving as pivots for the links of said chain, the under flanges of said angle bar being of a width and separated sufficiently to sustain objects of substantially the full width of the guide space, and to reject objects that are substantially smaller or in the wrong position.

10. In mechanism of the class described, a disk-like carrier, an air tight casing in which said carrier is rotatable, said casing having a peripheral opening and a box casing adjacent said opening, a guide, having slotted sides, arranged tangentially with respect to said carrier and adapted to guide objects to said opening, an endless conveyer chain traveling in said guide and box casing, hinge pins projecting through the slots therein, the ends of said pins carrying rollers, said box casing being of a width to inclose the chain and rollers.

In testimony whereof I affix my signature.

NELSON H. FOOKS.