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2,387,240

FISH CANNING MACHINERY

Filed July 13, 1942

3 Sheets-Sheet 1

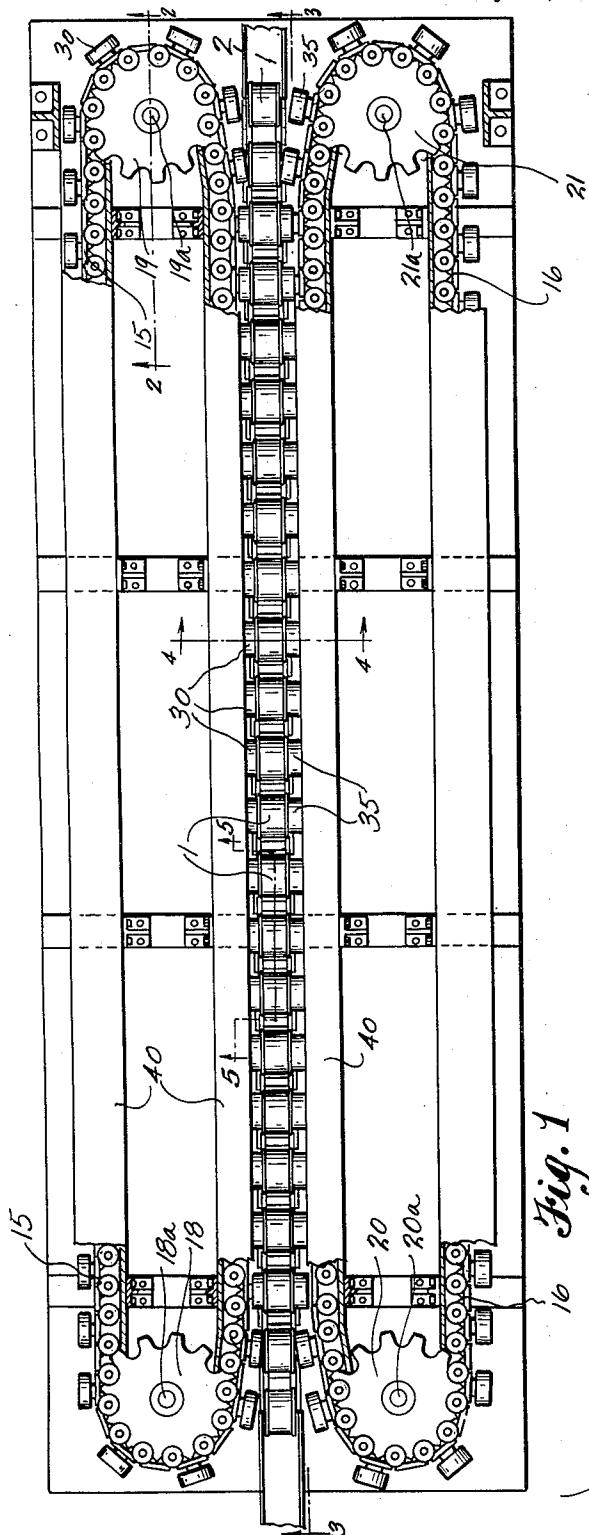


Fig. 1

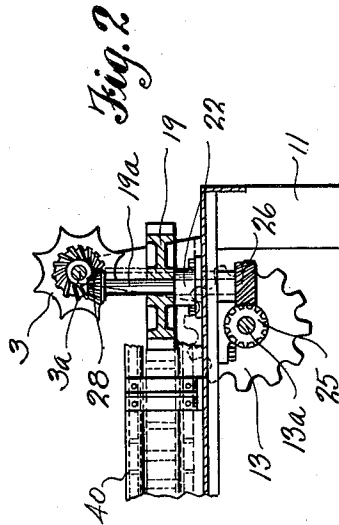


Fig. 2

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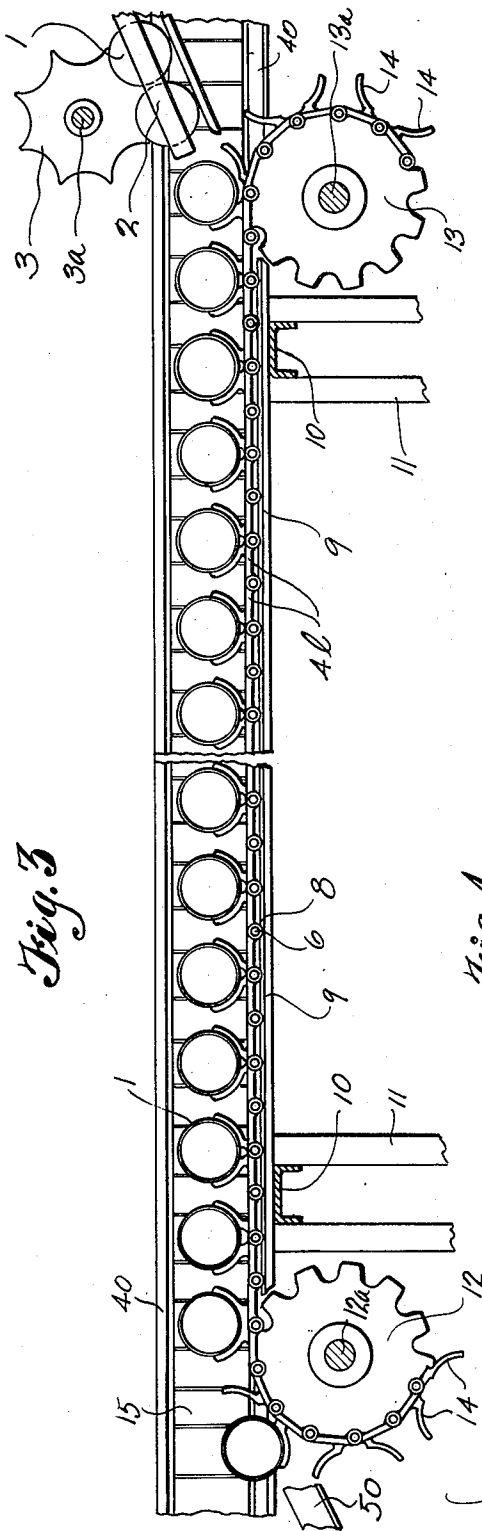
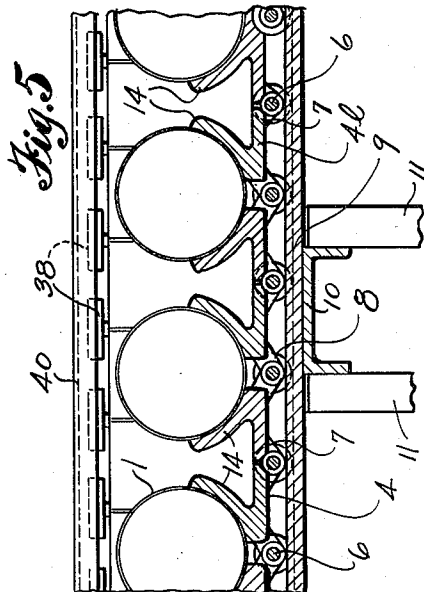
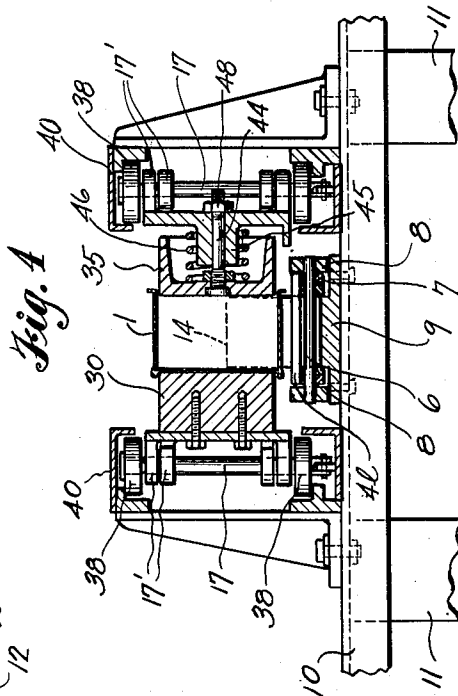
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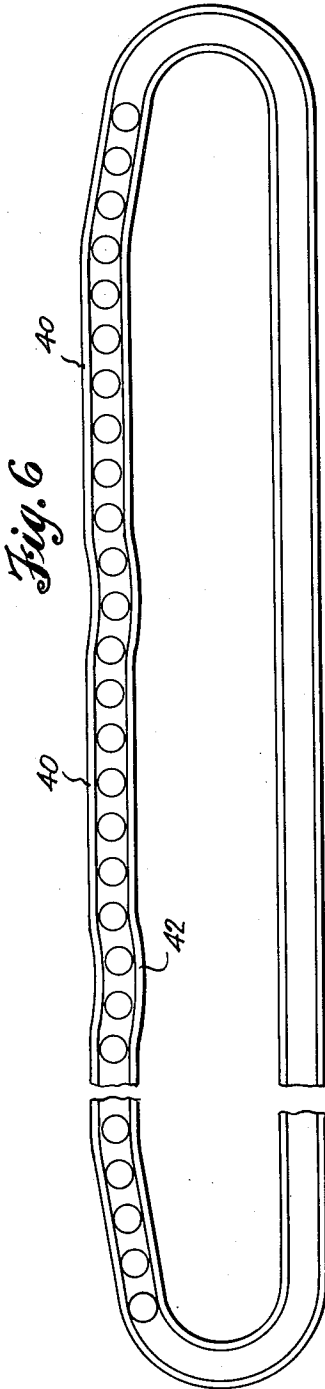
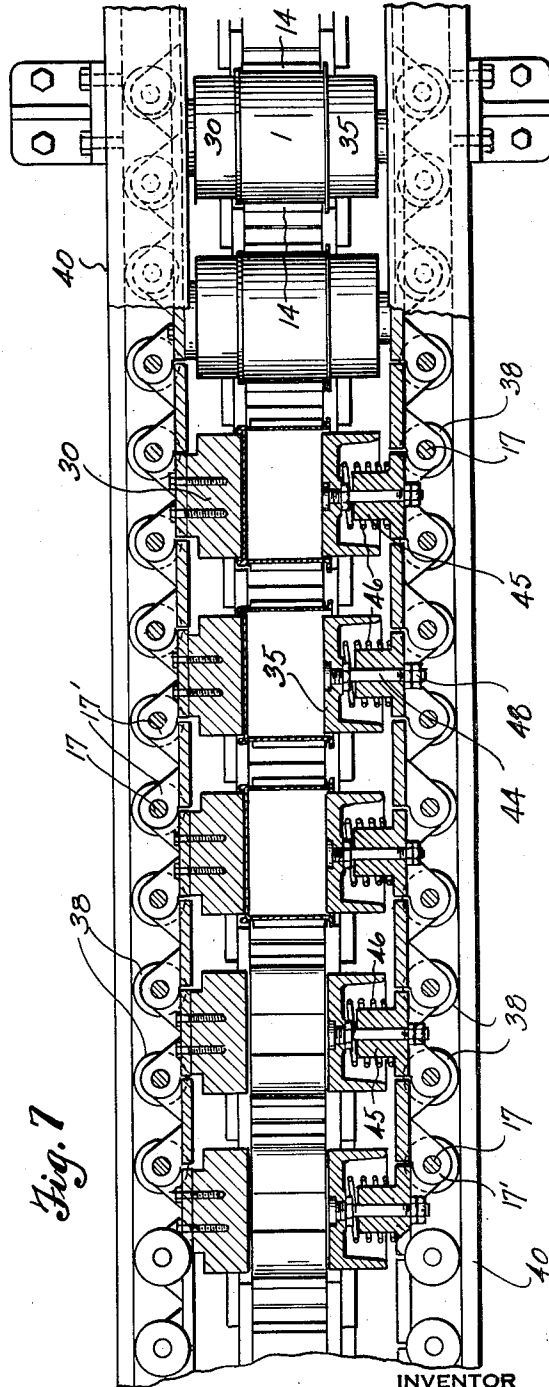
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3 Sheets-Sheet 3



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2,387,240

FISH CANNING MACHINERY

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Application July 13, 1942, Serial No. 450,701

4 Claims. (Cl. 100—36)

This invention relates to fish canning machinery and has reference more particularly to improvements in machines designed for the compressing of the fish after it has been placed in cans, but prior to operation of seaming the end closures onto the filled cans; this invention being designed for the same purposes of the machines which have been described and illustrated in my copending application filed May 16, 1942, under Serial No. 443,209, and for use in carrying on the method disclosed in my copending application filed February 17, 1942, under Serial No. 431,255.

It is the principal object of this invention to provide a machine of the above character, designed for the quick, effective and economical compressing of fish in the cans for the purpose of extraction or displacement of liquid content therefrom; the desirability of which is explained in the above mentioned application on the method. Furthermore, it is an object of this invention to provide a machine of a continuous, progressive type; that is, to provide a machine in which the filled cans are to be received in rapid succession at one end thereof, to progress in a continuous stream through the machine while certain devices operate to apply mechanical pressure to their contents for the extraction or displacement of liquid content.

More specifically stated, the objects of the present invention reside in the provision of a machine of the character and for the purposes above stated, wherein the cans are conveyed horizontally, between two spaced and similarly moving pressure applying belts, on one of which belts, abutments or tables are arranged to seat against the closed ends of the cans, and on the other of which, pistons or plungers are arranged for entering the open ends of the cans to compress the fish or other contents thereof; also, there being guideways in which supports for the pressure applying belts travel and whereby the belt which carries the plungers is caused to so advance the plungers into the cans as to effect a predetermined, desired pressure against the contents of the cans as they travel through the machine.

Still further objects of the invention reside in the details of construction of belts, guideways, and other parts, and in the combination and mode of operation of parts as will hereinafter be fully described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is a top, or plan view of the machine with parts of the belt guideways broken away for better understanding of parts enclosed thereby.

Fig. 2 is a detail of the belt and can conveyor drive gearing taken on line 2—2 in Fig. 1.

Fig. 3 is a longitudinal section as seen in the vertical plane of line 3—3 in Fig. 1.

Fig. 4 is an enlarged, cross section on the line 4—4 in Fig. 1.

Fig. 5 is a sectional view taken on the line 5—5 in Fig. 1.

Fig. 6 is a plan view of one of the roller guideways.

Fig. 7 is a plan view of one of the guideways for the belt which carries the pressure applying plungers.

Briefly described, the present machine which is of the horizontal type as distinguished from the vertical, rotary type, comprises a continuous conveyor belt, having one run thereof operable along a horizontal guideway; this belt being equipped, at regular intervals of spacing, with means for receiving and holding the filled cans horizontally and transversely of the belt as they are conveyed thereby from one end of the machine to the other. Operable along this horizontal run of this can conveyor belt, at opposite sides thereof and adjacent the opposite ends of the conveyed cans, are coacting pressure applying belts which, respectively, are equipped with abutment pads for engaging against the closed ends of the cans, and with plungers for entering their open ends for the compression of the cans' contents. The belts are all operated in synchronism to cause the pads and plungers to travel along in synchronism with the travel of the cans, and in functional registration therewith. Also, guideways are provided for the pressure applying belts so that they will be properly spaced and will be moved relative to each other as required to first bring the pressure devices into position, and then to bring about the compressing of the contents of the cans as they progress through the machine.

Referring more in detail to the drawings—

As will best be observed in Figs. 1 and 3, the filled cans 1 are delivered by gravity down a guide chute 2 and to an indexing star wheel 3 which operates to space and time the delivery of cans into the receiving end of the machine, where they are discharged onto a conveyor belt 4. The belt 4 is continuous, and in its construction comprises a succession of belt links 41, all of the same dimensions and joined together in succession by hinge shafts 6, extended through ears 7 that project into overlapped relationship

from the adjacent edges of the links. At the ends of the hinge shafts 6 are rollers 8, designed to support the horizontally extended top run of the belt for easy travel upon a horizontally extending guide plate or rail 9 which is fixedly supported in the frame structure of the machine. As noted in Figs. 1 and 4, this frame comprises a plurality of spaced, horizontal cross beams 10 and vertical legs 11, all of which would be rigidly joined to give the machine the required strength.

Details of the conveyor belt 4 are shown in Figs. 3 and 4. Fig. 3 shows the belt to be extended about sprocket wheels 12 and 13 located at opposite ends of the machine and supported, respectively, on cross shafts 12a and 13a; the shaft 13a being driven for the operation of the machine. The hinge shafts 6 which pivotally join the belt links, are designed to seat between the teeth of the sprocket wheels in passing thereover and thus serve as the means through which the belt may be driven.

In the belt 4, adjacent links are provided with upwardly diverging, arcuately curved seats 14-14, designed to cooperatively receive the cans therein and to hold them properly registered with the abutments and plungers on belts 15 and 16 whereby the liquid extracting pressure is applied to the cans' contents. As will be seen in Fig. 2, the wheel 13 is located at the receiving end of the machine, below the star wheel and end of chute 2, and by reason of the curvature of the belt, in its passing about the wheel, adjacent seats 14-14 will be opened apart as noted, to easily receive the cans between them, then as the belt in passing onto the rails 9, straightens out, the seats will close together and conform to the cylindrical curvature of the can body, and will hold the can against lateral play on the belt, and by reason of their engaging the double seam and flange at opposite ends of the can bodies, will hold them against endwise shifting.

Supported for travel in the same horizontal plane, and at opposite sides of the line of cans as supported on rail 9 by the top run of the conveyor 4, are the pressure applying belts, designated in their entirety, respectively, by numerals 15 and 16. Each of these belts is coextensive with belt 4 and is a continuous link belt with the links of rectangular plate form and joined hingedly together at adjacent edges by pivot or hinge shafts 17 extended through ears 17' formed on the link edges.

The belt 15 operates at its ends about sprocket wheels 18 and 19 carried on vertical shafts 18a and 19a. Likewise, belt 16 operates about sprocket wheels 20 and 21 carried on vertical shafts 20a and 21a. These vertical shafts are rotatably supported in suitable bearings provided therefor in the frame structure as at 22 in Fig. 2, and both belts are driven in unison and in an exact timing with the belt 4 by any suitable means, such as that shown in Fig. 2, wherein 23 is a gear that is fixed on the shaft 13a to operate in driving mesh with a gear 24 fixed on the lower end of shaft 19a which mounts the sprocket wheel 19 about which the belt 15 operates. A similar gear arrangement would be provided to drive shaft 21a on which the sprocket wheel 21 is fixed and about which belt 16 operates.

At its upper end, the shaft 19a has a geared driving connection with shaft 3a which mounts the indexing wheel 3, as at 25 in Fig. 2, and it will be understood that these connections provide for the desired synchronous travel of the

various belts and the timing the delivery of cans to the machine and to the belts.

Mounted on alternate links of the belt 15 are abutment pads, or tables 30, and their spacing is exactly in accordance with the conveying disposition of cans on the conveyor 4 and, in the operation of the machine, these pads will be brought flatly into engagement with the close ends of the cans upon their entrance into the machine. Preferably, these pads would fit within the countersink of the can end.

Likewise, mounted on alternate links of the belt 16 are the plungers 35, spaced in accordance with the spacing of the cans as carried by the belt 4 and adapted to freely enter the open ends of the cans as they are brought into the machine. The hinge shafts 17 which join the links of the belts 15 and 16 are equipped at their ends with rollers 38 adapted for travel in continuous, horizontal guideways 40 which are arranged in the frame structure as shown in Fig. 1, and these guideways are so shaped, or designed, that they will cause cooperatively arranged plungers and pads to gradually converge toward the can ends at the entrance of the machine, and to likewise diverge at the discharge end of the machine. Along the top or main run of the belt 4, the adjacent run of the belt 15 is straight, and is parallel with rail 9 upon which the belt 4 operates. The guideway which carries the belt 16 is straight for the most part and parallel with rail 9, but at intervals, has slight outward bends as at 42 in Fig. 6, whereby brief intervals of release of pressure are made possible. The spacing of the guideways whereby the belts 15 and 16 are carried, is such, with respect to the line of cans as carried by the belt 4 on rail 9, that the desired pressure may be gradually applied to the cans' contents by the plungers on belt 16 while the applied pressure is sustained by the abutments on belt 15.

The guideway for belt 16 may be so inclined that, after the plungers have been brought into the open end of a can, the pressure can be gradually applied over an extended length of travel to any extent that might be found necessary as determined by the character of the product being canned.

In order to compensate for slight differences in the extent of filling of the cans, the plungers 35 are fixedly mounted on stems 44 and these are slidable in bearings 45 in the links. Coiled springs 46 bear against the links and against the plungers to urge them into the cans but the extent of outward movement is limited by nuts 48 adjustably threaded onto the inner ends of the stems.

Assuming the machine to be so constructed, its use and mode of operation is as follows:

Cans 1, filled to the designated extent, are delivered down chute 2 and are timed in their individual delivery to seats of the belt conveyor 4, which operates to move the cans along rail 9 through the machine. As the cans thus enter the machine, the belts 15 and 16, traveling in their guideways 40, are caused to slightly converge and thus to bring the abutments into engagement with closed ends of the cans, and the plungers into their open ends. Then, as the cans advance, the plungers are caused to move slightly inward and to exert a gradually increased pressure on the cans contents, with periodic relief of the pressure, that causes a sort of pumping action that will effectively extract liquid contents from contents of the cans. This flows out

and may be caught in a receptacle if desired. The pressure applied may be varied as desired either by adjustment of the guideways, or by spring pressure, and the extent of entrance of the plungers may be determined by the adjusting 5 of the nuts 48 on their mounting stems.

At the discharge end of the machine, the belts 15 and 16, by reason of guideway design, are caused to diverge and thus to release the cans. The cans are then discharged from belt 4 into a 10 delivery chute 50 for conveyance to a point of further operation.

In this way, the desired extraction of liquid from the fish, or other contents of the cans, may be economically and expeditiously accomplished, 15 and the invention becomes very desirable in the method as set out in my previously mentioned copending application covering a method of canning fish.

It is to be understood that the details of construction herein disclosed might be varied to meet 20 certain special requirements or conditions, and that size and length of the machine may be governed to some extent by the capacity desired, the product being canned, and the size of cans employed.

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

1. In a machine of the character described, a 30 conveyor guiding and supporting rail, belt guides at opposite ends of the rail, an endless conveyor belt operable over the said guides and upon the said rail, and comprising hingedly joined links; adjacent links being equipped with parts coacting to form can seats and adapted to open apart in 35 the passing of said links about said belt guides, means for driving the belt, means for placing filled, unclosed cans in the open seats at one end of the rail, for conveyance along the rail, a pair 40

of endless belts operable along the guide rail at opposite sides of the conveyor belt, abutments on one belt for engaging the closed ends of conveyed cans, plungers on the other belt arranged to enter the open ends of the cans and press against the contents thereof, and cam rails for guiding said belts to cause the abutments to hold the cans in their seats and the plungers to apply pressure against the cans' contents.

2. A machine as recited in claim 1 wherein the plungers are yieldingly mounted on the belt, and wherein the cam rail for that belt is so located as to cause a yielding application of pressure to the can's contents.

3. A machine as recited in claim 1 wherein the paired endless belts that are operable along the guide rail at the opposite sides of the conveyor belt are link belts, and wherein the links are wheel mounted for travel on the cam rails.

4. In a machine of the character described, an elongated guiding and supporting rail, a traveling endless belt conveyor arranged to ride upon said rail and equipped at intervals therealong with can mounting seats, belt guideways extended 25 along said rail at opposite sides thereof, belts movable in said guideways in accordance with direction and rate of travel of the said conveyor, abutments on one of said belts adapted to be brought against the closed ends of cans placed 30 in the seats of the conveyor in its travel along the rail, plungers mounted on the other belt and adapted to be advanced thereby with travel of the conveyor along the rail into the open ends of the cans to effect compression of their contents, 35 and means for disengaging the abutments and plungers from the cans after the compression of their contents for the removal of the cans from their mounting seats.

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