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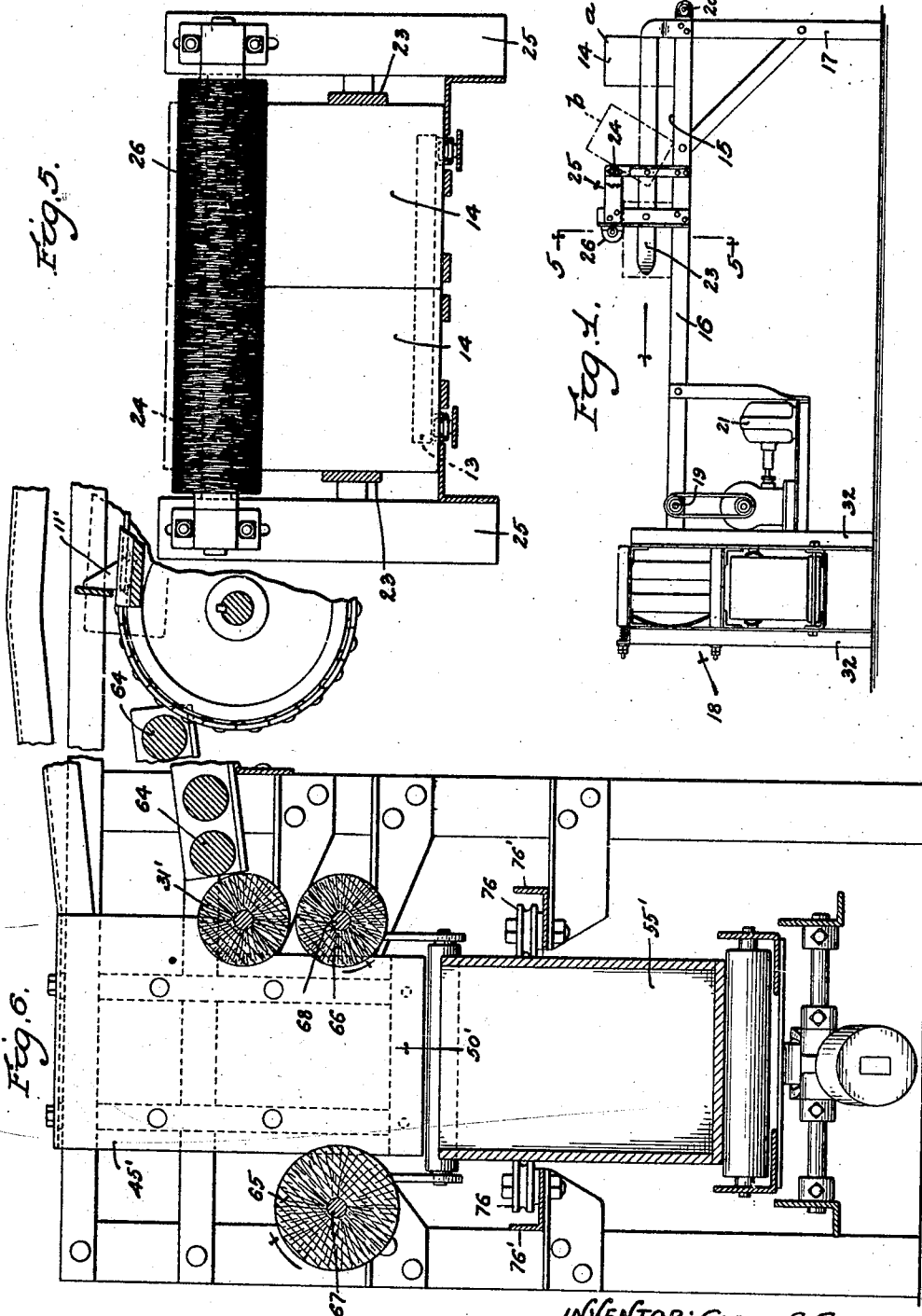
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G. A. SMITH

CAN PACKING AND TESTING MACHINE

Filed Sept. 6, 1927

3 Sheets-Sheet 1



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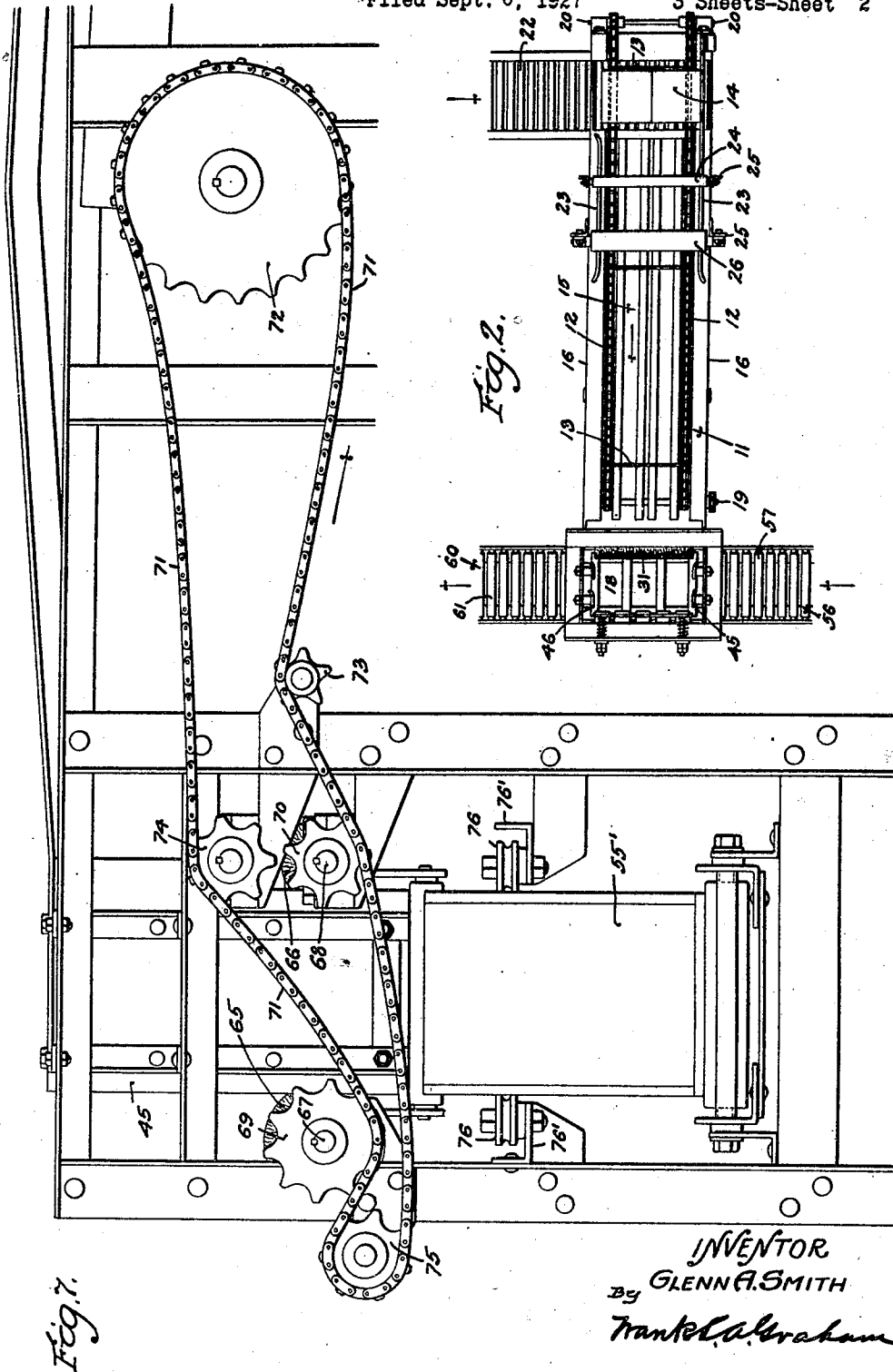
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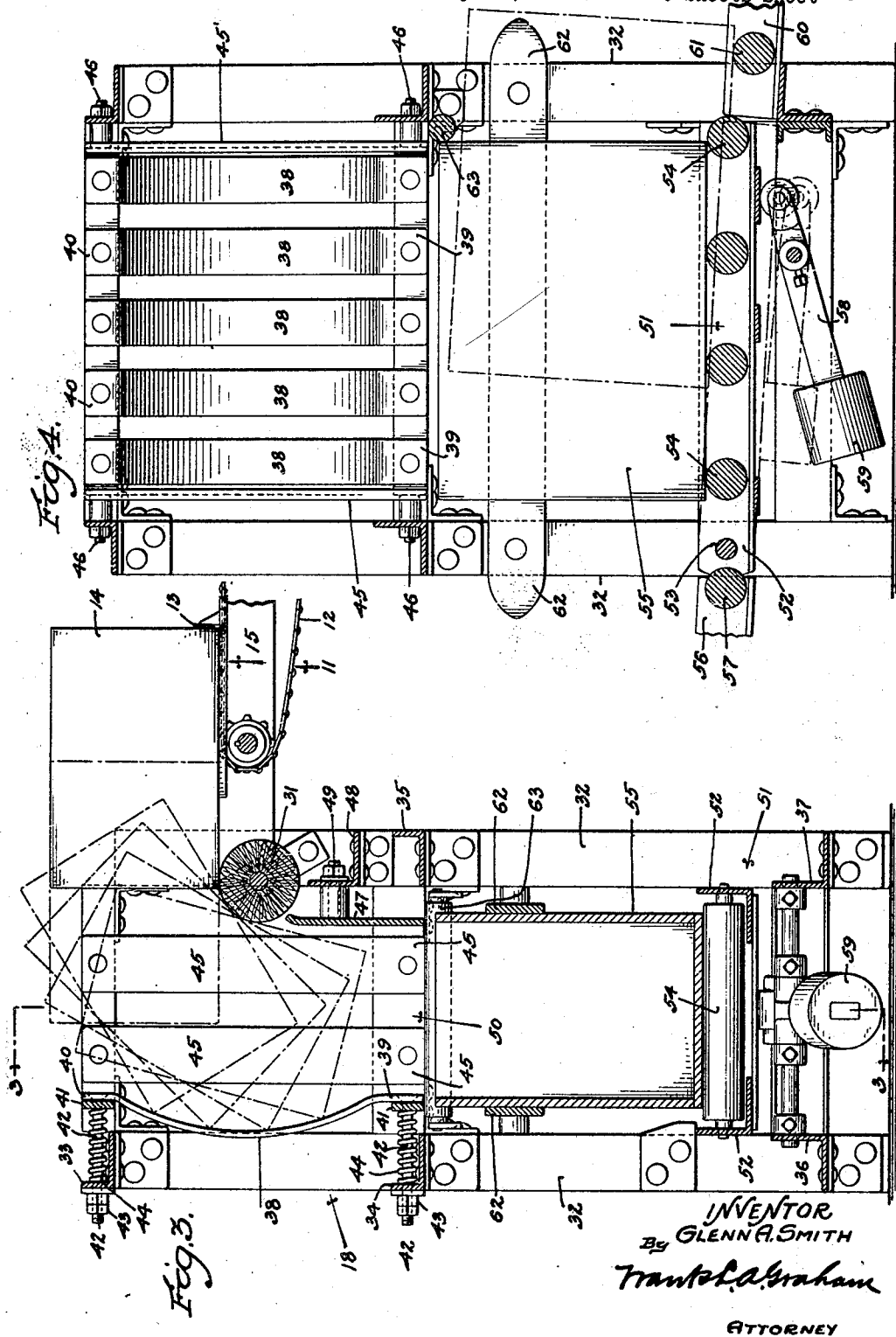
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UNITED STATES PATENT OFFICE.

GLENN A. SMITH, OF LOS ANGELES, CALIFORNIA.

CAN PACKING AND TESTING MACHINE.

Application filed September 6, 1927. Serial No. 217,654.

My invention relates to the art of packing liquids, being more particularly a device for packing cans of gasoline or like substance and testing the cans during the packing to detect the presence of leaks.

Ordinarily five gallon tin cans, having a square section, are used as containers for gasoline, and two of such containers are placed in a wooden case for shipment. This operation is at present carried out by manual labor and the testing of the cans for leaks performed only in a casual manner, resulting in many cans being packed in a leaky condition and in discoloration of the cases, loss of contents and an increase of fire hazard.

One of the principal objects of my invention is to produce a packing device or apparatus of simple form and construction for placing the tin containers referred to, or similar packages, in a shipping case entirely by machine which, during the operation of packing, applies pressure to or squeezes the cans so that opposite sides thereof are compressed toward each other and any leaks in same are apparent to the operator, thereby insuring that only tight cans are placed in the shipping cases.

To attain these objects, I have produced a device or apparatus which consists generally of a feed conveyor upon which the cases to receive the cans are brought under a delivery or packing throat comprising a throat through which the cans are delivered to the cases, in which means are provided for applying pressure to the sides of the cans, causing leaks, if any, to be manifested by the egress of contained fluid and to also adjustably control the speed at which the cans are deposited in the packing cases. In connection with this delivery or packing throat, I employ a receiving conveyor upon which the cans are placed vertically or horizontally in pairs, after being received from the soldering operation closing the can cap or filling opening. Cans are then delivered in pairs in a horizontal position to a feed roller over and around which they are brought to a vertical position immediately above the packing throat, by means of adjustable guides. In connection with this receiving conveyor, in case the cans are placed upon the receiving conveyor in a vertical position, I provide an initial tilting and testing device which tumbles the cans to a horizontal position and

applies pressure to the can for the purpose also of determining the presence of leaks in the cans.

Other objects and advantages will appear hereinafter from the following description.

Referring to the drawings, which are for illustrative purposes only,

Fig. 1 is a diagrammatic side elevation, partly in section, showing in general an apparatus embodying a form of my invention.

Fig. 2 is a diagrammatic plan view corresponding to Fig. 1.

Fig. 3 is an enlarged vertical sectional view of the packing throat and adjacent parts.

Fig. 4 is a vertical sectional view on line 4-4 of Fig. 3.

Fig. 5 is a cross-sectional view on line 5-5 of Fig. 1.

Fig. 6 is a vertical sectional view through the packing throat of a modified form of my invention, and

Fig. 7 is an elevation further illustrating the operation of the form of my invention shown in Fig. 6.

More particularly describing my invention, as illustrated in the drawings, 11 designates a conveyor hereinafter referred to as the receiving conveyor, which, in the form shown, consists of endless chains 12 connected by cross bars 13 which engage behind the cans 14 and move the same forward in the direction of the arrow shown in Figs. 1 and 2, the cans resting on a table 15, mounted in a frame 16, suitably supported from the floor by legs 17 at one end and by the structure of a packing throat frame generally designated at 18 at the opposite end. The chain 12 is mounted on shafts 19 and 20, the shaft 19 being driven from a motor or other power means indicated at 21.

The cans 14 are placed in pairs, that is, side by side, upon the conveyor 11 by means such as a filling conveyor 22 (Fig. 2) in an upright position, as shown at "a" in Fig. 1, and are carried forwardly by the conveyor 11 between the guide bars 23 until the cans strike a cross bar 24 mounted in a subframe 25 which tilts the cans over as indicated at "b" in Fig. 1, causing the cans to lie in a horizontal position on the conveyor as they pass under a pressure roller 26 which is adjustably mounted in the subframe 25, so that the sides of the cans are engaged between the roller 26, the conveyor table 15, and the guide

bars 23, with sufficient pressure to press the sides of the can engaged thereby, thus forcing the contained liquid through any weak joints in the can and consequently showing liquid on the exterior thereof.

This pressure device I term a tilting and testing throat, consisting of the roller 26, guide bars 23, and supporting table 15.

In the form of my invention shown in Figs. 1 to 4, inclusive, the cans coming from the conveyor 11 are passed to a feed roller 31, supported in the packing and testing throat frame 18, which consists of vertical members 32 and cross bars 33, 34, 35, 36 and 37. In passing over the roller 31, the cans are directed through the dotted line positions shown in Fig. 3 by a series of bowed plates 38 which are preferably symmetrically curved on a radius from the axis of the roller 31. These bowed slats have flat engaging ends 39 and 40 through which they are resiliently mounted on cross bars 41 by bolts 42, extending through cross members 33 and 34 of the packing throat and provided with suitable nuts 43. The nuts 43 engage coiled springs 44 which are disposed on the bolts 42 between the bars 41 and members 32 and 33 for holding the bowed slats in semi-rigid relation to other parts of the packing throat.

The sides of the packing throat adjacent to the bowed slats 38 are comprised of guide plates 45 and 45' mounted on the frame by means of suitable bolts 46, and the side opposite the bowed slats and beneath the roller 31 is provided with a pressure guide plate 47, which is supported on a cross member 48 by means of bolts 49.

The vertical guide plates 45 and 45' are so arranged and the bowed slats so adjusted that the cans, after being directed to a vertical position, will pass through the throat 50 formed by the flat surface 39 and the guide plates 45 and 45', receiving therein a quadri-directional side pressure which is sufficient to manifest any openings or leaks in the can, by the egress of the contained liquid. This throat is further arranged and adjusted to direct the cans into a packing case placed therebelow as hereinafter described.

Arranged beneath the lower end of the packing throat 50 is a platform 51 consisting of a frame 52, pivotally mounted by means of a rod 53 to the main frame in any suitable manner. This frame 51 is provided with a series of rollers 54 mounted therein which receive a case 55 from any suitable form of case delivering conveyor 56, in the present instance consisting of a series of rolls 57 arranged in inclined relation to each other, so that the cases may move by gravity thereover. The frame 52 and rollers therein are held in horizontal position by means of a weighted arm 58, the weight 59 being sufficient to support an unloaded case thereon, but as the cans are delivered from the packing

throat 50 to the case 54 on the platform 51, the platform is tilted sufficiently to permit the loaded case to travel out from under the packing throat to a case receiving conveyor 60, consisting of a series of rollers 61. The cases are held in proper position under the throat 50 by means of guide bars 62 and a stop roller 63, said roller engaging the upper advancing end of the case as shown in Fig. 3, which engagement remains until the case has been loaded and the platform tilts to allow the case to pass to the case receiving conveyor 60.

In the form of my invention shown in Figs. 6 and 7, the cans are introduced from the conveyor 11' onto an auxiliary roll conveyor 64 over which they are carried to the feed roller 31'. The packing and testing throat in this form of my invention consists of two oppositely disposed power driven rolls 65 and 66, which are mounted in the packing throat frame on shafts 67 and 68, and are driven in the direction of the arrows shown in Fig. 6, at the same peripheral speed by means such as the sprocket wheels 69 and 70, keyed to the rollers shafts 67 and 68, and driven by the chain 71 which travels in the direction of the arrows indicated in Fig. 7.

72 indicates a power driven sprocket wheel for driving the chain 71. 73, 74 and 75 are idlers for giving the desired directional movement of the chain over the sprocket wheels 69 and 70.

It will be understood that in order for the rollers 65 and 66 to have the same peripheral speed, it is necessary that the diameter of the sprocket wheels 69 and 70 respectively be in the same ratio with the diameters of the respective rollers. The rollers 65 and 66 are preferably mounted with their axes in the same horizontal plane, and in order that the cans passing over the directing roller 31' may be directed to a vertical position over the packing case 55', I make the roller 65 of greater diameter than the rollers 31' and 66, the latter two being preferably of equal diameter.

The packing throat 50' is further provided with vertical side guide plates 45', and as the cans are carried through the throat formed between the guide plates 45' and the rollers 65 and 66, the speed of descent of the cans is governed by the revolution of the rolls 65 and 66. These rolls are further adjusted relative to each other, and the guide plates 45' are so arranged that a pressure is applied to the descending cans, which is sufficient to cause the egress of fluid through any leaks or weak positions in the cans, making the presence of same readily ascertainable.

In the form of my invention (shown in Figs. 6 and 7) I may further employ a series of horizontal rolls 76 mounted upon angle bars 76' and engaging the upper portion of the case 55' for the purpose of holding the

cases in a proper position relative to the packing throat 50'.

In the use of my invention I preferably provide all of the can engaging rolls with a semi-yieldable surface such as asbestos wrappings or other fibrous covering, as illustrated on the roller 26 in Fig. 5.

In the operation the cans are preferably placed on the receiving conveyor in upright position, so that when the same are tilted into horizontal position and pass under the tilting throat the bottoms of the cans are advancing toward the inspector who is located at the packing end of the apparatus, in order that any leaks on the bottoms of the cans may be observed as they approach the observer. As the cans are uprighted in the packer and advanced through the second or packing throat, wherein a second pressure is applied on the cans, any leaks on the tops thereof are immediately discernible. The squeezing of the cans referred to, it will be understood, is against the sides of the cans as the sides ordinarily slightly bulge outwardly between their ends.

I claim as my invention:

1. In an apparatus for testing and packing cans: conveyor means; a throat adapted to receive cans from said conveyor means; and means in the throat for exerting pressure on the sides of the cans passing therethrough.

2. In an apparatus for testing and packing cans: conveyor means for receiving said cans; an initial testing throat cooperating with said conveyor to exert pressure on the sides of the cans when in horizontal position on said conveyor; means for uprighting the cans as they leave said conveyor; and means for exerting pressure on the cans in upright position.

3. In an apparatus for testing and packing cans: conveyor means for receiving said cans; an initial throat cooperating with said conveyor to exert pressure on the sides of the cans when in horizontal position on said conveyor; a vertically arranged packing throat for receiving the cans delivered from said conveyor; means in said packing throat for exerting pressure on the sides of said cans; and means under said packing throat for supporting a case to receive the cans from said packing throat.

4. In an apparatus for testing and packing cans: conveyor means for receiving said cans; an initial throat cooperating with said conveyor to exert pressure on the sides of the cans when in horizontal position on said conveyor; a vertically arranged packing throat for receiving the cans delivered from said conveyor; means in said packing throat for exerting pressure on the sides of the cans; means under said packing throat for supporting a case to receive the cans from said packing throat, said case supporting means consisting of a platform pivotally mounted

under said packing throat; and weight means for yieldingly holding said platform in horizontal position.

5. In an apparatus for testing and packing cans: conveyor means for receiving said cans in a vertical position; tilting means for placing said cans in a horizontal position, comprising a fixed member cooperatively mounted relative to said conveyor and engageable by said vertical cans; means for exerting pressure on said horizontal cans; means for uprighting said cans; means for exerting pressure on said vertical cans; and means for delivering said cans to receiving cases.

6. In an apparatus for testing and packing cans: means for receiving said cans in vertical position; conveyor means engageable with the bottom of said cans; fixed means extending transversely with the direction of movement of said conveyor and engageable by said cans effecting their horizontal placement; roller means pressurably engageable with said advancing horizontal cans; and means for packing and testing said cans in a vertical position.

7. In an apparatus for testing and packing cans: conveyor means for receiving said cans in a vertical position; means for tilting said cans to a horizontal position; means for testing said cans in a horizontal position; and means for uprighting, testing and packing said cans in a vertical position, comprising a roller member, an oppositely disposed bowed member, and cooperating vertical members forming a throat.

8. In an apparatus for testing and packing cans: conveyor means for receiving said cans in a vertical position; means for tilting said cans to a horizontal position; means for testing said cans in a horizontal position; and means for uprighting, testing and packing said cans in a vertical position, comprising a roller member, a bowed member, and cooperating vertical members forming a throat, said bowed member being symmetrically curved relative to the axis of said roller member and oppositely disposed thereto.

9. In an apparatus for testing and packing cans: conveyor means for receiving said cans in a vertical position; means for tilting said cans to a horizontal position; means for testing said cans in a horizontal position; and means for uprighting, testing and packing said cans in a vertical position, comprising a roller member, an oppositely disposed bowed member, and cooperating vertical members forming a throat, said bowed member being held in a resiliently adjustable position relative to said roller member.

10. In an apparatus for testing and packing cans: conveyor means for receiving said cans in a vertical position; means for tilting said cans to a horizontal position; means for testing said cans in a horizontal position; and means for uprighting, testing and pack-

ing said cans in a vertical position, comprising a plurality of oppositely disposed roller members, and cooperating vertical members forming a throat.

5 11. In an apparatus for testing and packing cans: conveyor means for receiving said cans in a vertical position; means for tilting said cans to a horizontal position; means for testing said cans in a horizontal position; 10 and means for uprighting, testing and packing said cans in a vertical position, comprising an inclined conveyor member, a pair of roller members mounted one above the other, a single roller member disposed oppositely thereto, and cooperating vertical members 15 forming a throat.

12. In an apparatus for testing and packing cans: conveyor means delivering said cans in a horizontal position to a packing 20 throat; a directing roller and a cooperating bowed member for uprighting said cans; ad-

justable throat means cooperatively formed below said uprighting means for exerting a quadri-directioned pressure on the sides of said descending cans; and means for receiving said cans. 25

13. In an apparatus for testing and packing cans: conveyor means delivering said cans in a horizontal position to a packing throat; a packing throat comprising two oppositely disposed vertical members; a directing roller member and two oppositely disposed pressure roller members mounted at right angles with said vertical members and cooperating therewith to form a throat; and 30 means rotating said pressure rollers at the same peripheral speed. 35

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 23rd day of August, 1927.

GLENN A. SMITH.