

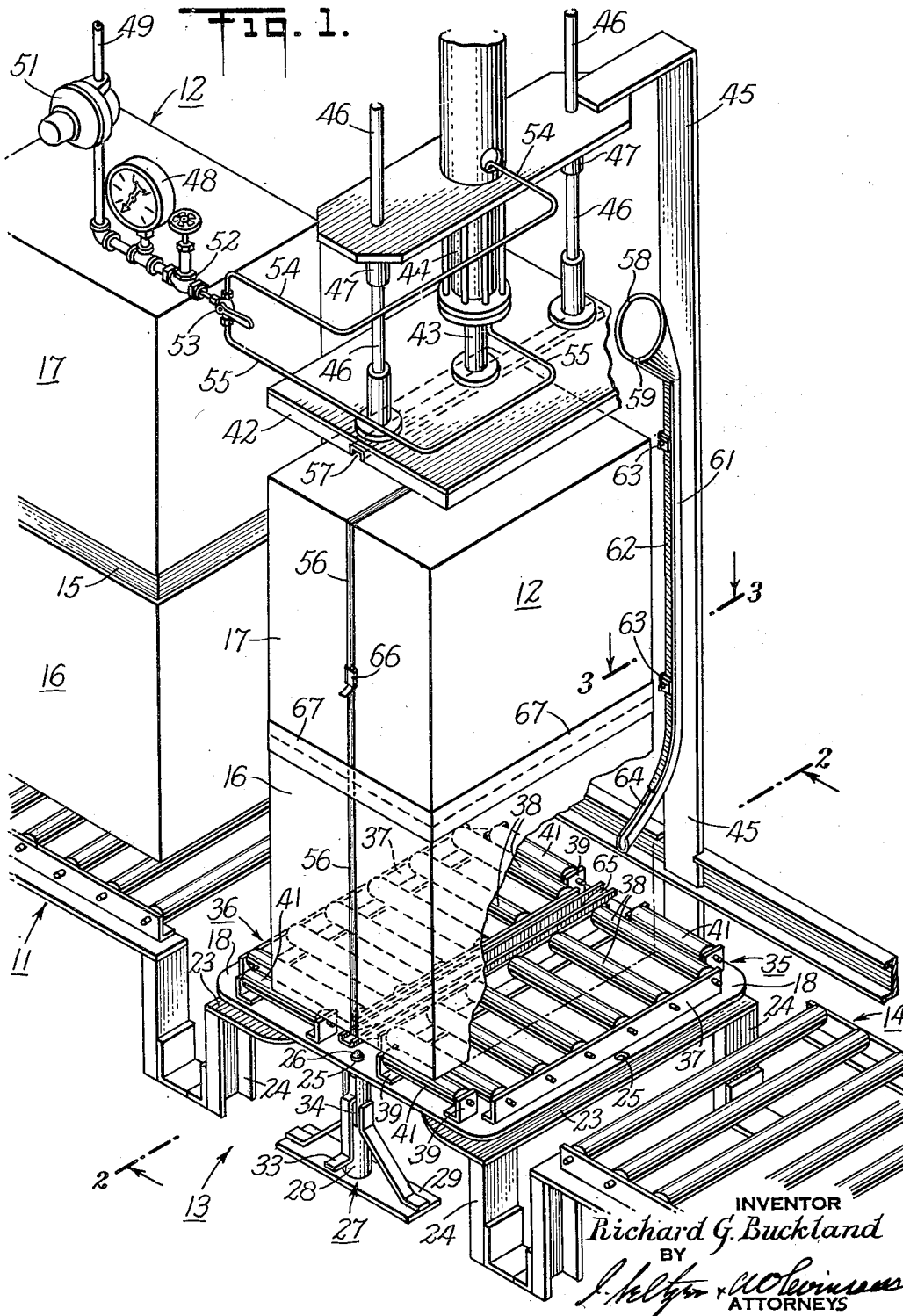
March 24, 1953

R. G. BUCKLAND
PACKAGING DEVICE

2,632,381

Filed Oct. 8, 1949

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

Fig. 2.

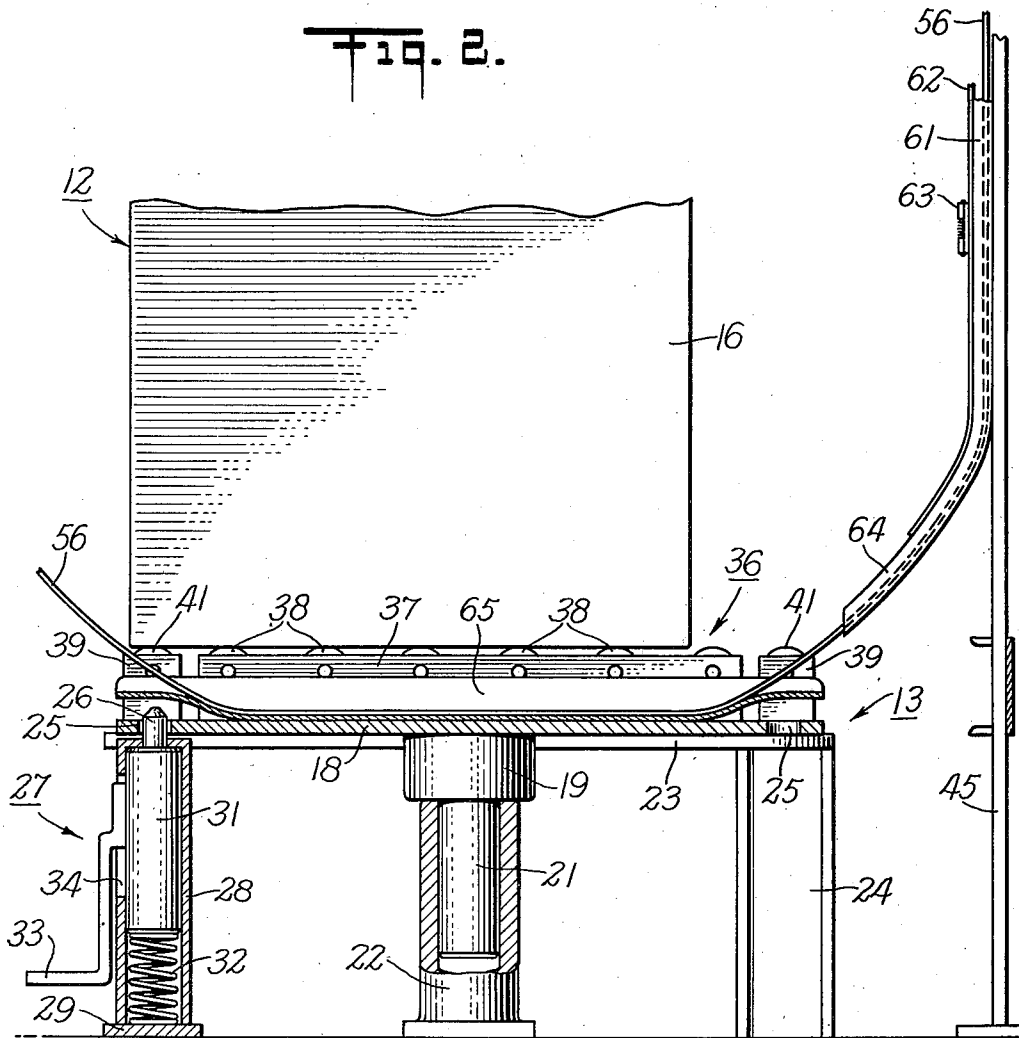
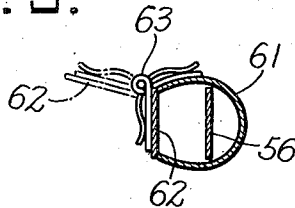


Fig. 3.



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PACKAGING DEVICE

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4 Claims. (Cl. 100—7)

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This invention relates to a packaging device and relates more particularly to an apparatus for closing cartons.

As is well known, it is common in closing cartons made of corrugated paper, cardboard and similar materials to compress said cartons before they are sealed in the closed position. This reduces the size of the cartons and also consolidates the contents of said cartons so as to minimize the possibility of damage caused by the contents shifting about within the closed cartons. Heretofore, it has been the practice to compress the cartons by passing a band, such as a steel strap, cord or the like, around the cartons and drawing the ends of said band together until the desired compression has been effected. In compressing the cartons in this manner, a localized force is applied to the external surfaces of said cartons. This can, and usually does, result in damage to the cartons as well as to their contents.

It is an important object of this invention to provide a packaging device which will be free from the foregoing and other disadvantages and which will be especially simple in construction and efficient in use.

A further object of this invention is the provision of an apparatus for closing cartons wherein the cartons will be compressed to the closed position by means independent of the sealing means employed for holding the cartons in the closed position.

Other objects of this invention, together with certain details of construction and combinations of parts, will be apparent from the following detailed description and claims.

A preferred embodiment of my invention will now be described with reference to the accompanying drawings wherein

Fig. 1 is an isometric view, showing the general arrangement of the apparatus for closing cartons,

Fig. 2 is a cross-sectional, detail view taken on the line 2—2 in Fig. 1 in the direction of the arrows, and

Fig. 3 is a cross-sectional, detail view taken on the line 3—3 in Fig. 1 in the direction of the arrows.

Referring now to the drawings, the reference numeral 11 designates generally a roller conveyor along which cartons 12 that have been filled, but not yet closed, are transported to a conveyor section, indicated generally by reference numeral 13. At the conveyor section 13, the cartons 12 are compressed and secured in the closed position, following which the closed cartons are removed from the conveyor section

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13 along a roller conveyor, indicated generally by reference numeral 14. While cartons of any type may be compressed and secured in the closed position with the apparatus of my invention, it will be described with particular reference to a carton comprising an inner tubular liner 15 over which are telescoped a lower cap 16 and an upper cap 17, which caps 16 and 17 abut each other when the carton is properly closed. In Fig. 1 of the drawings, a carton 12 that has not yet been compressed and sealed in the closed position, its caps 16 and 17 still being spaced from each other, is shown on the roller conveyor 11, and a carton 12 that has been compressed and sealed in the closed position so that its caps 16 and 17 abut each other is shown on the conveyor section 13.

The conveyor section 13 comprises a supporting plate 18 that is mounted on a bracket 19 located centrally of said plate. A pin 21 projects downwardly from the bracket 19 into a substantially tubular pedestal 22, permitting the supporting plate 18 to be rotated freely in a horizontal plane. The supporting plate 18 is adapted to rest on platforms 23 carried by channel-iron brackets 24, which platforms 23 serve to prevent tilting and rocking of the supporting plate 18 when filled cartons 12 are placed on the conveyor section 13 and when said cartons are being compressed.

The supporting plate 18 is provided with a plurality of locating apertures 25 extending therethrough, which are engaged by a pin 26 of a foot-operated stop, indicated generally by reference numeral 27, to locate the conveyor section 13 properly with respect to the roller conveyors 11 and 14. As shown, the locating apertures 25 are positioned to be engaged by the pin 26 for every 90 degrees of rotation of the supporting plate 18. The foot-operated stop 27 comprises a tubular sleeve 28 supported on a stand 29 and having a plunger 31, carrying the pin 26, slidably mounted therein. The plunger 31 is urged upwardly by a spring 32 so as to bring the pin 26 into engagement with aperture 25. To move the plunger 31 downwardly and release the pin 26 from engagement with aperture 25, there is provided a foot-operated pedal 33, which extends through a slot 34 in the walls of the tubular sleeve 28 and is fastened to said plunger 31.

Mounted on the supporting plate 18 are two parallel roller conveyors, indicated generally by reference numerals 35 and 36, each of which comprises a pair of angle-iron supports 37 having conveyors rolls 38 positioned therebetween.

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Also mounted on the supporting plate 18, adjacent both ends of the roller conveyors 35 and 36, are pairs of brackets 39 having conveyor rolls 41 positioned therebetween. The brackets 39 are spaced apart a distance less than the spacing between the angle-iron supports 37 and the conveyor rolls 41 are shorter than the conveyor rolls 38 so as to provide an adequate clearance between said conveyor rolls 41 and said conveyor rolls 38 and the roller conveyors 11 and 14 as conveyor section 13 is rotated.

Positioned centrally above the conveyor section 13 is a platen 42 having a lower surface of extended area for contacting the carton 12. The platen 42 is fastened to the free end of a piston rod 43 carried in a fluid-operated cylinder 44 supported by a framework 45, said platen being restrained from rotation by a pair of guide rods 46, which are fastened thereto, and extend through sleeves 47 carried by the framework 45. Fluid for operating the cylinder 44 is supplied thereto under a pressure indicated by a pressure gauge 48, from any suitable source (not shown) through a conduit 49, having operatively connected thereto a pressure regulating valve 51, a shut-off valve 52 and a two-way valve 53, which permits the fluid to flow under pressure either into the top of the cylinder 44 through a line 54 for moving the platen 42 toward the conveyor section 13, or into the base of the cylinder 44 through a line 55 for moving the platen 42 away from the conveyor section 13.

In operation, the conveyor section 13 is rotated until the roller conveyors 35 and 36 are aligned with the roller conveyor 11, i. e. through an angle of 90 degrees from that shown in the drawings, at which point the pin 26 will engage one of the apertures 25. A carton 12 which has been filled, but not yet closed or sealed, is moved from the roller conveyor 11 onto the conveyor section 13, the pin 26 is released from the aperture 25 by depressing the pedal 33, and the conveyor section 13 is rotated through an angle of 90 degrees, i. e. to the position shown in the drawings so that the roller conveyors 35 and 36 are at right angles to the roller conveyor 11, the pin 26 once more engaging one of the apertures 25. The valve 53 is now operated to introduce fluid under pressure into the cylinder 44 through the conduit 54 so as to move the platen 42 toward the conveyor section 13, thereby compressing the carton 12 to the closed position, i. e. to the position where the edges of the open ends of the caps 16 and 17 are in abutting relation. Since the pressure applied to the fluid-operated cylinder 44 is maintained constant by the pressure-regulating valve 51, the force applied by the platen 42 to the carton 12 will also remain constant. As a result, all the cartons 12 will be subjected to a uniform degree of compression, which is not the case where the cartons 12 are compressed by manually applying tension to a band encircling said cartons. In addition, since the carton 12 is contacted over an extended area by the platen 42 and by the conveyor rolls 38 of the roller conveyors 35 and 36, there will be no localized forces applied to the external surfaces of said carton during the compression thereof and no tendency to damage either the carton or its contents. When the carton 12 is fully compressed the end of a strap 56 is introduced into a groove 57 in the under surface of the platen 42. The strap 56, after passing through the groove 57, feeds into a funnel-shaped guide 58 having a slot 59 wider than said strap extending the full length thereof. The funnel-

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shaped guide 58 directs the strap 56 into a channelled guide 61, which is normally closed by means of a plate 62 mounted on spring hinges 63 that urge the plate 62 into a closed position as shown in full lines in Fig. 3 of the drawings. The plate 62 acts to prevent the strap 56 from slipping out of the guide 61 as it passes there-through. The lower end 64 of the guide 61 is curved and directs the strap 56 into a channelled guide 65 extending across the supporting plate 18 between the roller conveyors 35 and 36. After the strap 56 has completely encircled the carton 12, the ends thereof are drawn together to eliminate all slack therefrom. This will pull the strap 56 through the slot 59 in the funnel-shaped guide 58 and will also move the plate 62 to the position shown in dotted lines in Fig. 3 of the drawings, permitting the strap 56 to leave the guide 61 and contact the walls of the carton 12. When all the slack has been eliminated from the strap 56, the ends thereof are drawn together by means of a suitable tool and are connected by a clip 66, thereby holding the carton 12 in its closed position. The valve 53 is then operated to introduce fluid under pressure into the cylinder 44 through the conduit 55 so as to move the platen 42 away from the conveyor section 13. The pedal 33 is depressed to disengage the pin 26 from the aperture 25, permitting the conveyor section 13 to be rotated freely as a gummed tape 67 is applied around the carton 12, at the position where the upper and lower caps 16 and 17 abut, to seal said carton against the access of dust and dirt. The conveyor section 13 is then rotated until the roller conveyors 35 and 36 are aligned with the roller conveyor 14 and the carton 12 is removed from the conveyor section 13 along the roller conveyor 14.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit of my invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. In an apparatus for closing cartons, the combination with means for supporting cartons, of a platen, pressure means for urging said platen toward said supporting means for compressing said cartons to a closed position, the carton contacting surface of the platen having a groove therein for the passage of a band for securing the cartons in said closed position, a guide member positioned adjacent to said groove in the platen when said platen is in position for receiving the band as it passes from the groove in said platen, a second guide member attached to said first guide member and extending therefrom towards said supporting means, and a third guide member positioned to receive the band from the second guide member and to direct the band across said supporting means, whereby the band is guided around the cartons and tightened about said cartons without releasing said pressure means.

2. In an apparatus for closing cartons, the combination with means for supporting cartons, of a platen, pressure means for urging said platen toward said supporting means for compressing said cartons to a closed position, the carton contacting surface of the platen having a groove therein for the passage of a band for securing said cartons in the closed position, a funnel-shaped guide member having a slot wider than the band positioned to receive a band as it passes

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from the groove in said platen, a channeled guide member extending from said funnel-shaped guide member toward said supporting means, and another channeled guide member positioned to receive the band from said first channeled guide member and to direct said band across said supporting means, whereby the band is guided around the cartons and tightened about the cartons without releasing said pressure means.

3. In an apparatus for closing cartons, the combination with a conveyor section having roller conveyors thereon for supporting said cartons, of a platen, pressure means for urging said platen toward said conveyor section for compressing said cartons to a closed position, the face of the platen which contacts said cartons having a groove therein for the passage of a band for securing said cartons in said closed position, a funnel-shaped guide member having a slot wider than said band extending the full length thereof positioned to receive the band from the groove in said platen, a channelled guide member extending from said funnel-shaped guide member toward said conveyor section, means yieldably closing said channelled guide member to keep said band from slipping out of said channelled guide member, and another channelled guide member positioned to receive said band from said first channelled guide member and direct said band across the conveyor section, whereby said band is guided around said cartons and may be tightened against said cartons without releasing said pressure means.

4. In an apparatus for closing cartons, the combination with a rotatable conveyor section having a pair of parallel roller conveyors thereon for supporting said cartons, of a platen, a fluid-operated cylinder operatively connected to said platen for urging said platen toward said conveyor section for compressing said cartons to a closed position, the face of the platen which contacts said cartons having a groove therein for

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the passage of a band for securing said cartons in said closed position, a funnel-shaped guide member having a slot wider than said band extending the full length thereof positioned to receive the band from the groove in said platen, a channelled guide member extending from said funnel-shaped guide member toward said conveyor section, a plate yieldably closing said channelled guide member, another channelled guide member positioned between the spaced roller conveyors of said conveyor section to receive said band from said first channelled guide member and direct said band across the conveyor section whereby said band is guided around said cartons and may be tightened against said cartons without releasing said pressure means, a roller conveyor for transporting cartons to said conveyor section, a roller conveyor for removing cartons from said conveyor section, and a foot-operated stop for stopping said rotatable conveyor section with the roller conveyors on said rotatable conveyor section parallel to or at right angles to said roller conveyors.

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