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CASE HOLD-DOWN APPARATUS

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This invention relates to case unloader apparatus wherein containers are removed from the cases or cartons that hold the same, and more particularly to hold-down apparatus operative to hold a case or carton while containers are lifted therefrom. The invention is particularly useful in conjunction with case unloaders for bottles, and in which the bottles are lifted in a generally vertical direction from their case while the case is held down upon the conveyor or platform.

In apparatus of the type herein considered, containers, such as bottles, are positioned within a carton that is usually compartmented so as to receive 12 or 36 bottles therein. In automatic machinery for mechanically removing the bottles from their case or carton, it is frequently necessary to mechanically hold the carton while bottles are lifted therefrom. Several reasons may necessitate the holding of the cartons, one of the most apparent being that bottles positioned therein may not be seated within their compartments in perfect alignment; and when a lifting force is applied thereto, it will be transferred to the carton and tend to lift the same.

An object of this invention is to provide case hold-down apparatus for use in equipment wherein containers are removed from cartons or cases. Another object of the invention is in the provision of hold-down apparatus that functions to engage the longitudinal upper edges of a bottle case so as to apply a downwardly directed force thereon that prevents upward movement of the case when bottles are withdrawn upwardly therefrom. Still another object of the invention is in the provision of hold-down apparatus of the character described which not only engages the upper longitudinal edges of a case or carton, but at the same time engages the side walls thereof, and that is provided with means whereby it automatically compensates for both height and width variations from a predetermined standard of cartons and cases.

A further object is that of providing a combination case hold-down and case alignment device that functions to align cases longitudinally as they are moved along a conveyor track, and which thereafter functions to maintain the cases in alignment and to constrain them from vertical movement while containers are lifted therefrom. Yet a further object is to provide apparatus of the character described which is quickly and easily adjusted so as to accommodate cases and cartons of various size. Still a further object is in the provision of a spring-biased guide and hold-down member that, while being readily adjustable so as to accommodate cartons and cases of predetermined width and height, are yieldable both vertically and horizontally so as to accommodate some deviation in either or both of these dimensions. Additional objects and advantages will appear as the specification develops.

An embodiment of the invention is illustrated in the accompanying drawing, in which—

Figure 1 is a top plan view of the apparatus; Figure 2 is a side view in elevation with parts broken away; and Figure 3 is a vertical sectional view taken along the line 3—3 of Figure 2, but showing the apparatus in position with respect to a conveyor.

Ordinarily, a pair of hold-down and alignment devices will be employed in connection with case unloader apparatus. For purpose of simplifying the drawing and the description thereof, only one such device is illustrated; and it should be noted that the corresponding device, which of course will be positioned along the opposite side of the conveyor and in spaced relation with the device shown, will be precisely of the same construction and will operate and function in an identical manner. Figure 3 shows the device in its operative relation with a conveyor that forms a part of case unloader apparatus with which the hold-down devices can be employed. The conveyor assembly comprises generally U-shaped channels that extend longitudinally of the case unloader, and in the illustration only one of these channels is shown. Supported for rotatable movement within the channels are shafts 11, each having a roller 12 mounted thereon. An endless belt 13 is entrained about the rollers, at least one of which will be driven so that the belt 13 forms a moving platform that advances cartons 14 (shown by broken lines in Figure 3) into operative relation with the hold-down devices and guide and through the case unloader apparatus.

Mounted on the upper leg of the channel 10 is a support block 15 that carries a mounting plate 16. The block 15 may be selected so that the height thereof elevates the hold-down and guide assembly, which is designated generally with the numeral 17, above the conveyor bed 13 so that cases or cartons 14 having a height within a predetermined range can be accommodated by the hold-down device. The block 15 is rigidly secured to the channel 10, and the support or mounting plate 16 in turn is rigidly secured to the block 15.

The device 17 includes a standard or post 18 equipped at its lower end with a pedestal 19. The pedestal 19 is positioned on the mounting block 16 and may be rigidly secured thereby by any suitable means, such as bolts or by spot welding, etc. As is shown most clearly in Figure 2, the post or standard 18 is flattened along one side thereof, as is shown at 20. Slidably mounted upon the post 18 is a support sleeve 21 having a protrusion or boss 22 extending outwardly therefrom along one side which has a bore therethrough that is threaded for threadedly receiving a cap screw 23. The cap screw 23 bears against one end of a locking pin 24, that at its other end abuts the flattened surface 20 of the post. The position of the support sleeve 21 vertically along the post 18 can be readily selected, and the sleeve then locked in position by tightening the cap screw 23 so as to frictionally engage the locking pin 24 with the flattened surface of the post.

It will be appreciated that the cap screw 23 could extend through the sleeve 21 and into engagement with the post 18, but preferably a locking pin 24 is interposed between the cap screw and post to prevent marring of the post. That is, the locking pin may be made of a material softer than the post so that if any deformation is caused by the frictional grip therewith, the locking pin will deform in deference to the post.

The sleeve 21 has a restricted lower end portion 25 that is threaded for threadedly receiving an enlarged nut or collar 26. It is evident from Figure 2 that the restricted end portion of the sleeve merges with the larger portion thereof so as to form an inclined shoulder 27. The collar 26 has an inclined shoulder 28 that corresponds with the shoulder 27, and defines therewith a restricted neck that rotatably receives thereabout a plate bracket 29. The bracket 29 extends forwardly of the post 18.
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and sleeve 21, and at its forward end is equipped with a hold-down member 30 having at its forward end an upwardly extending lip 31. Depending from the hold-down member 30 is a guide 32 that, as is most clear from Figure 1, has an outwardly diverging or outwardly curved mouth 33. The guide 32 may be welded or otherwise rigidly secured to the hold-down member 30, and that member may be formed integrally with or separate from the plate bracket 29. The bracket is not only pivotally mounted about the neck, but has generally a loose fit therein that also affords a tilting or tipping with impact thereto.

Extending forwardly of the sleeve 21, generally parallel with and in spaced relation with the plate bracket 29, is a carrier arm 34 that adjacent its forward end has a diverging L-shaped hanger or bracket 35 secured thereto. The horizontal leg of the inverted L-shaped bracket may be welded to the arm 34 so that the vertical leg of the bracket extends downwardly therefrom and is generally parallel with the post 18. The horizontal leg is elongated and extends laterally outwardly from the arm 34 and beyond the dimensional limits of the sleeve 21 which is slightly wider than the arm. The outer end portion of the horizontal bracket leg is apertured, as shown at 36, for receiving a stud 37. The diameter of the aperture 36 is somewhat broader than the diameter of the stud 37 so that the stud can shift in lateral or horizontal directions within the aperture. At its lower end, the stud 37 is received within and is secured to a foot 38 by means of a pin 39 that extends transversely through the foot and through an opening provided in the enlarged lower end 40 of the stud which projects into an opening provided for that purpose in the shoe. The pin 39 pivotally receives the apertured end 40 of the stud. A coil spring 41 seating at one end against the underside of the horizontal leg of the hanger 35, and at its other end against the enlarged lower end 40 of the stud, surrounds the stud and biases the same downwardly. The upper end of the stud may be threaded for threadedly receiving the lock nuts 42 which provide an adjustable stop for limiting downward movement of the stud.

The vertical leg of the hanger is also apertured at its lower end, as is indicated at 43, for passing a stud 44 therethrough. In this instance also, the diameter of the opening or aperture is slightly greater than that of the stud so as to permit lateral shifting of the stud within the opening. The outer end of the stud may be threaded, as shown at 45, for threadedly receiving a pair of lock nuts 46 that provide an adjustable stop to limit movement of the stud toward the right as viewed from Figure 2. The opposite end of the stud 44 is enlarged in a manner similar to that of stud 37, and is apertured for pivotally receiving a key or pin 39. Surrounding the stud and seating at one end against the vertical leg of the hanger 35, and at its other end against the enlarged end portion 47 of the stud, is a coil spring 48 that biases the stud toward the right, as seen in Figure 3.

The shoe 38 is secured to the plate bracket 29 by any suitable means, such as by welding. This interrelation of the shoe and plate is best seen in Figure 3.

In use of the devices, they will first be mounted on opposite sides of the carton 14 entered. As cartons are advanced by the moving conveyor 13, they will engage the guides 32 and will be aligned longitudinally thereby. The guides 32 will resiliently grip the vertical side walls of the carton, for the spring biasing force being exerted by the shoe 38 against the shoe 38 as they have its biasing force transferred through the shoe to the bracket plate 29, press-down member 30 and therothereith to the guide. The guides will then be effective to longitudinally center the carton 14 with respect to the conveyor 13 and with respect to the case unloader apparatus that will be associated therewith. By the same token, the devices are able to accommodate divisions in the width of the cartons because the spring 48 resiliently urges each guide 32 inwardly, and will then permit some outward yielding thereof. By the same token, the lateral displacement of the guide members is afforded because the plate brackets 29 are pivotally carried by the sleeve 21 and support collar 26.

The hold-down members 30 will resiliently engage the upwardly extending lip 31 of a case unloader apparatus or the up-turned lips 31 at the forward ends of the hold-down members 30 and will permit ready movement of the cartons into position beneath the hold-down members. The spring biasing force urging the shoe 38 downwardly will, in turn, yieldingly urge the hold-down member into gripping engagement with the side walls of the carton. Irregularities in the carton in its vertical dimension is afforded through the yieldability of the spring 41.

The hold-down devices are readily adjusted so that they can accommodate cases that sharply differ in height. That is, they may be selectively adjusted to accommodate half-depth cases, for example, or full-depth cases or cartons. Vertical adjustment is afforded by simply releasing the cap screw 23 slightly to permit vertical shifting of the sleeve 21 along the longitudinal edges of the vertical post 18. This type of locking arrangement also permits quick removal of the hold-down assembly in the event that repair or replacement thereof becomes necessary. The flattened surface 20 of the post prevents rotational movement of the sleeve 21 about the post, and provides a means for automatically mounting the device in the proper position and for locating the angularity thereof.

While in the foregoing specification an embodiment of the invention has been described in considerable detail for purposes of illustration, it will be readily apparent to those skilled in the art that numerous changes may be made in those details without departing from the spirit and principles of the invention.

I claim:

1. In a hold-down device adapted for use with a case unloader apparatus, an upwardly oriented post, a sleeve carried by said post and having an arm extending forwardly therefrom, a push-down stud supported by said arm and being movable vertically with respect thereto, said stud being biased vertically away from said arm, and a hold-down member carried by said stud and pivotally associated with said post, said hold-down member being adapted to resiliently engage an upper edge of a case positionable therebelow.

2. The device of claim 1 wherein said hold-down member at its forward end is equipped with an upwardly turned lip to facilitate movement of cartons thereunder.

3. In a hold-down device of the character described, an upwardly extending post, a hold-down member supported for rotational movement about the longitudinal axis of said post and being adapted to receive an upper edge portion of a carton thereunder, a push-down stud, a shoe connecting said stud and hold-down member, a sleeve positionally mounted on said post and provided with an outwardly extending arm, the end of said stud opposite the end connected with said shoe being operatively associated with said outwardly extending arm, and spring means biasing said stud downwardly and away from said arm to urge said hold-down member into resilient engagement with the edge of a carton positionable thereunder.

4. In a device of the character described, an upwardly extending post, a guide supported for pivotal movement about the longitudinal axis of said post and having a laterally flared outer end to facilitate movement of a carton into engagement therewith, a guide stud supported for movement in a plane substantially normal to the longitudinal axis of said post, means connecting said stud and guide together, means supporting the end of said stud opposite the end associated with said guide in spaced relation to said post, and spring means biasing said stud
away from said supporting means and in a direction to resiliently urge the guide into engagement with a side wall of a carton advancing therepast.

5. In a device of the character described, a vertical post provided with a pair of spaced, laterally extending members, the lower of said members being pivotally mounted on said post, a guide adapted to engage a side wall of a carton advancing therepast, a hold-down member adapted to engage an upper longitudinal edge of a carton advancing thereunder, a shoe operatively coupled with said guide and hold-down member, said shoe being mounted on said lower member, a push-down stud pivotally connected with said shoe and being biased downwardly to provide a downward push thereagainst, and a guide stud pivotally connected with said shoe and applying a biasing force thereagainst, both of said studs being mounted on the upper of said members.

6. In case hold-down and case guiding apparatus of the character described, an upwardly extending post, a bracket plate supported for pivotal movement about said post, a hold-down member provided by said bracket plate, a guide supported by said bracket plate, a shoe secured to said bracket plate, a push-down stud pivotally connected to said shoe and being vertically oriented, a guide stud pivotally connected with said shoe and being horizontally oriented, spring means biasing said push-down stud downwardly, and spring means biasing said guide stud in horizontal direction, whereby said guide and hold-down member are each resiliently urged into engagement with a wall of a carton advancing therepast.

7. The apparatus of claim 6 in which a sleeve is carried by said post and is vertically adjustable with respect thereto, and in which said bracket plate is mounted upon said sleeve for pivotal movement with respect thereto.

8. The apparatus of claim 6 in which a sleeve is mounted upon said post and is equipped with a support arm extending forwardly thereof, and in which a hanger having a vertically disposed leg and horizontally disposed leg is carried by said arm, each of said legs being provided with an opening therethrough one of which movably receives said push-down stud and the other of which movably receives said guide stud.

9. The apparatus of claim 6 in which each of said studs is provided with an enlarged end portion, said shoe is provided with openings therein receiving such enlarged portions, and in which a pivot pin extends through said shoe and pivotally supports the enlarged end portions of each of said studs.

10. In a device of the character described adapted for use in case unloader apparatus for guiding cartons into longitudinal alignment within such apparatus, an upwardly extending post, an arm pivotally mounted on said post and having a portion contoured to fit the upper longitudinal edge of a carton, a second arm mounted on said post above said first arm, a L-shaped member secured to said second arm and spring urged means connecting the arm portions of said L-shaped member with said contoured portion of the said first arm.

References Cited in the file of this patent

UNITED STATES PATENTS

377,456 Haltz ........................ Feb. 7, 1888
1,011,594 Dunham ........................ Dec. 12, 1911
1,365,368 Bliss .......................... Jan. 11, 1921
2,647,670 Cox ............................. Aug. 4, 1953

FOREIGN PATENTS

572,287 Germany ........................ Mar. 14, 1933