July 24, 1956 L. McGIHON 2,755,611

BOTTLE SPREADER

Filed Dec. 31, 1952 5 Sheets-Sheet 1

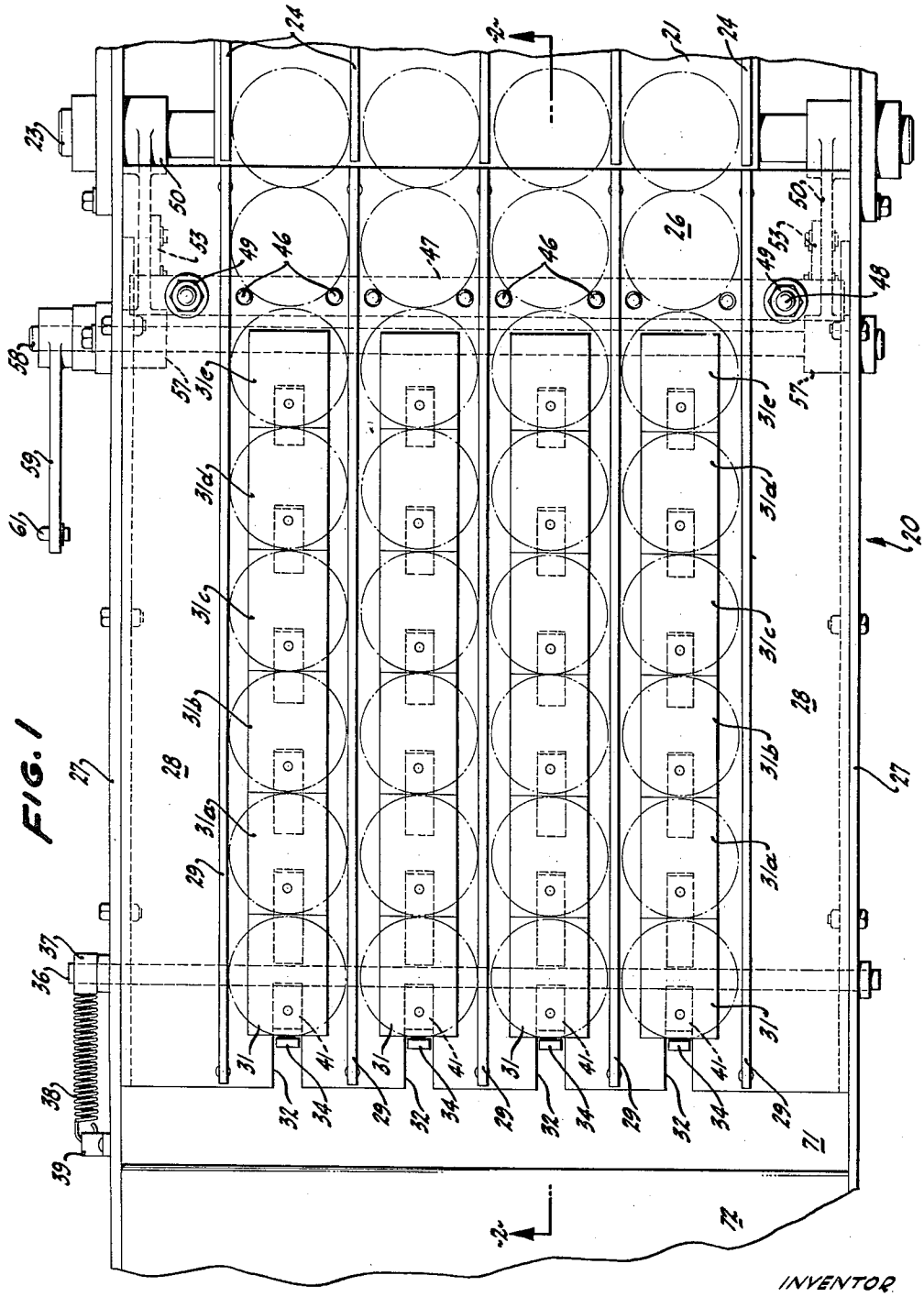

FIG. 1

INVENTOR
LEONARD McGIHON
BY Harper Allen
ATTORNEY

July 24, 1956 L. McGIHON 2,755,611

BOTTLE SPREADER

Filed Dec. 31, 1952 5 Sheets-Sheet 2

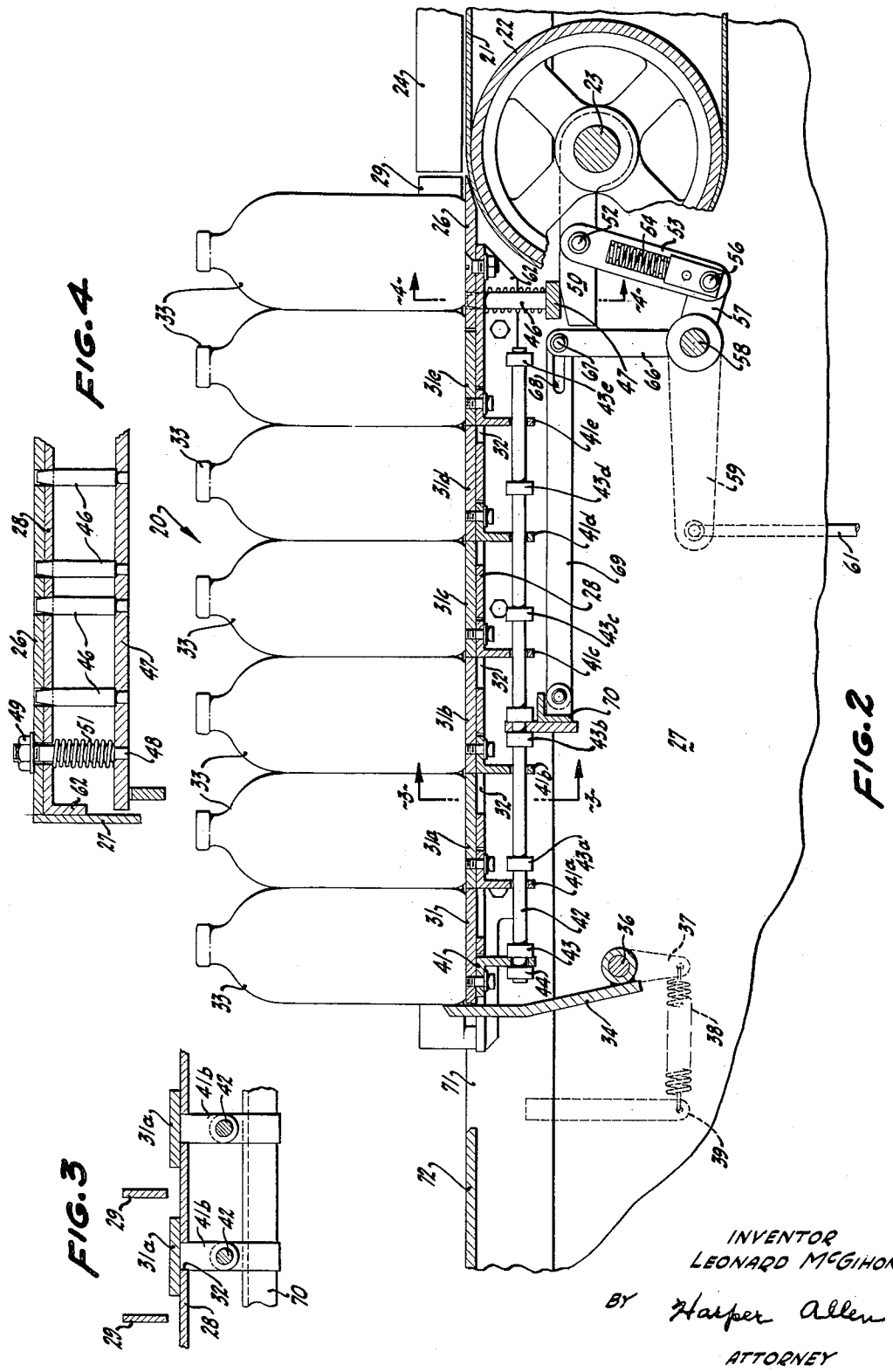

FIG. 2

FIG. 4

FIG. 3

INVENTOR
LEONARD McGIHON
BY Harper Allen
ATTORNEY

July 24, 1956 L. McGIHON 2,755,611

BOTTLE SPREADER

Filed Dec. 31, 1952 5 Sheets-Sheet 3

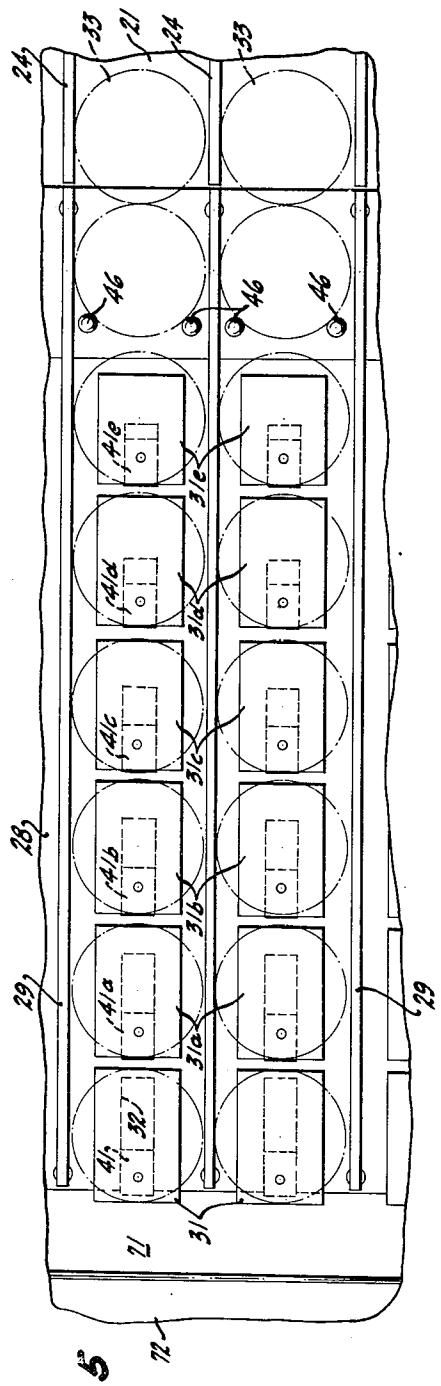

FIG. 5

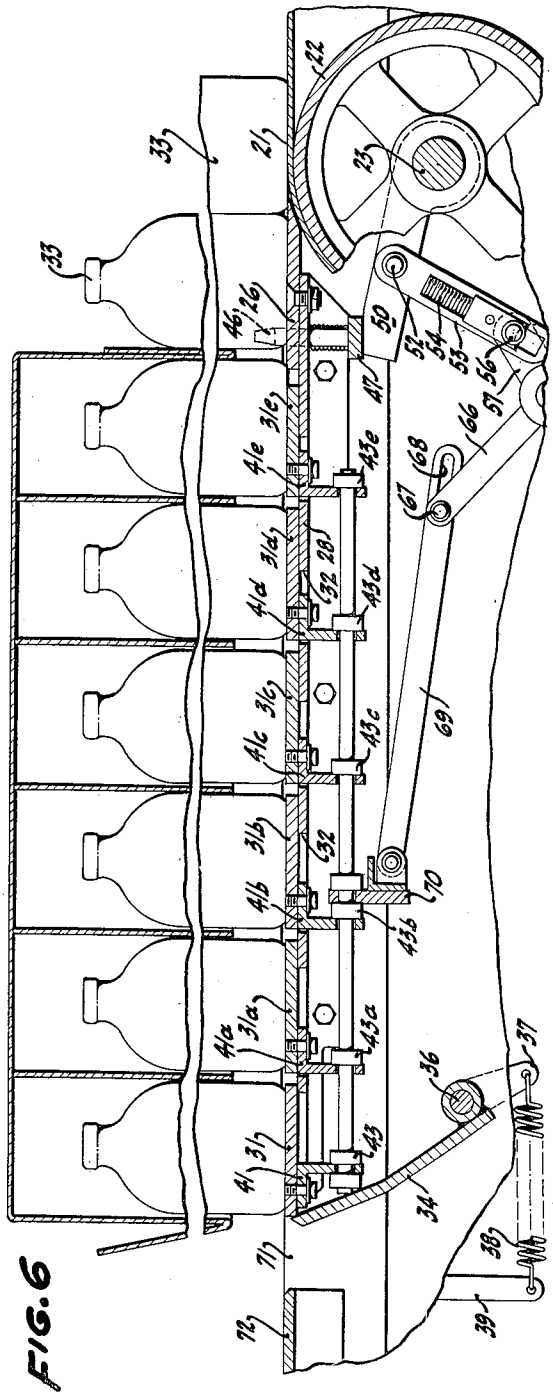

FIG. 6

INVENTOR
LEONARD McGIHON
BY Harper Allen
ATTORNEY

July 24, 1956 L. McGIHON 2,755,611

BOTTLE SPREADER

Filed Dec. 31, 1952 5 Sheets-Sheet 4

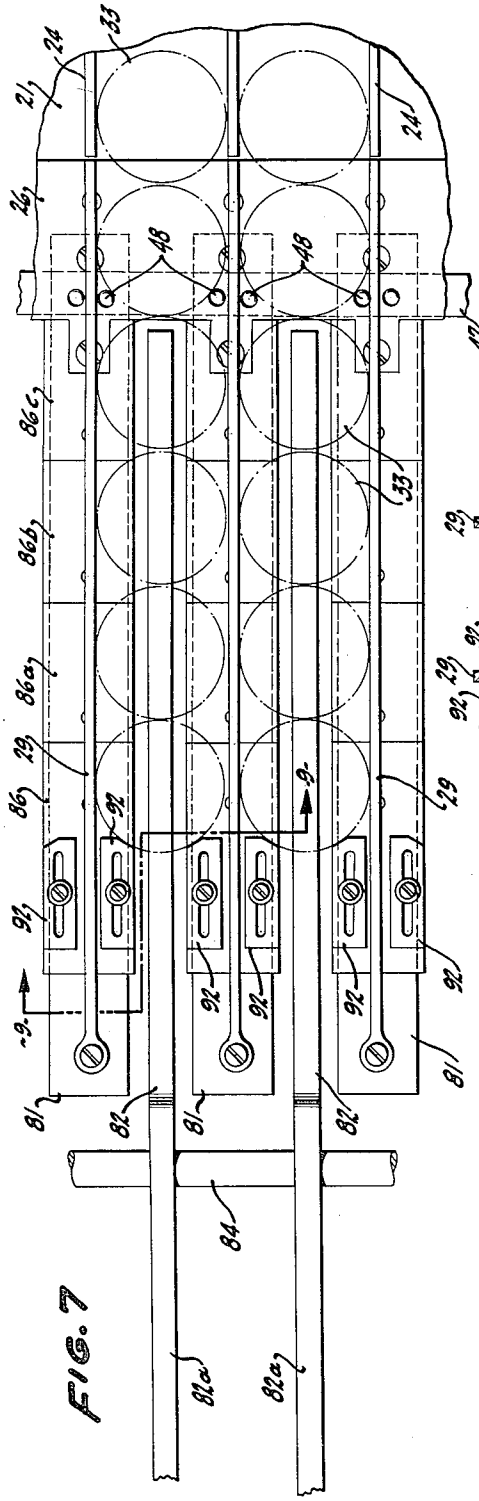

FIG. 7

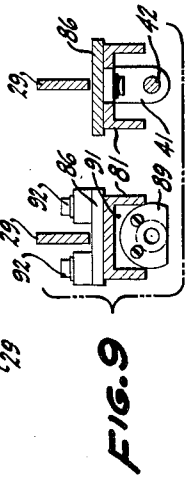

FIG. 9

FIG. 8

INVENTOR
LEONARD McGIHON
BY Harper Allen
ATTORNEY

July 24, 1956 L. McGIHON 2,755,611

BOTTLE SPREADER

Filed Dec. 31, 1952 5 Sheets-Sheet 5

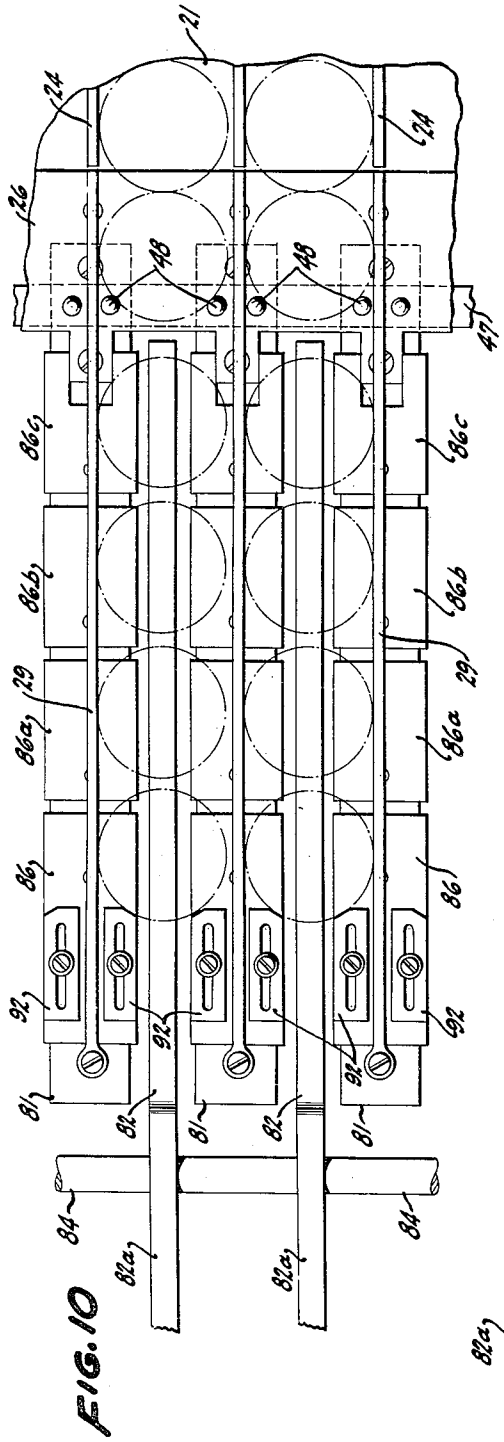

FIG. 10

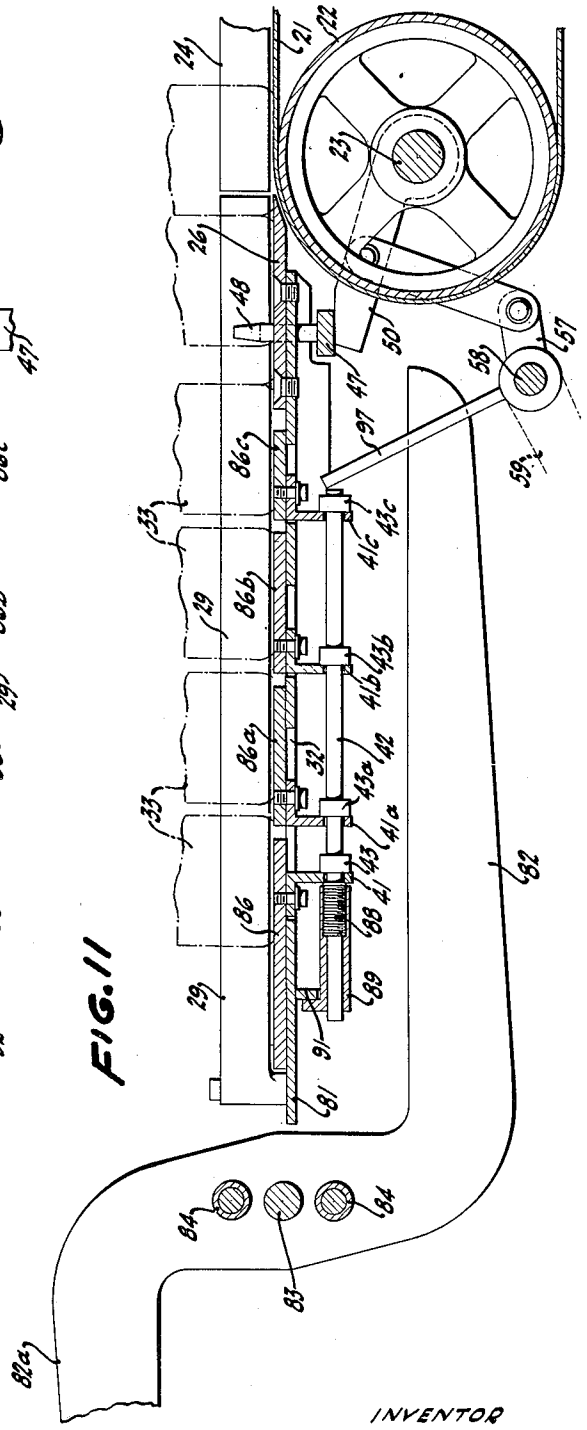

FIG. 11

INVENTOR
LEONARD McGIHON
BY Harper Allen
ATTORNEY

United States Patent Office 2,755,611 Patented July 24, 1956

2,755,611

BOTTLE SPREADER

Leonard McGihon, San Leandro, Calif., assignor to King Sales & Engineering Co., San Francisco, Calif., a corporation of California

Application December 31, 1952, Serial No. 328,889

11 Claims. (Cl. 53—391)

The present invention relates to the provision of bottle separating spreading means, for example in casing machines, and is concerned more particularly with the provision of means for receiving an array of bottles of a number to fit within a case, and means for separating the bottles so as to enable entry of the partitions within a case between the adjacent bottles.

In certain types of casing machines, it is customary to feed parallel files of bottles in upright position onto a casing station to form a rectangular array corresponding in number to the number of bottles packed to the case, in position to receive an inverted case with a partition assembly therein over the bottles. In such machines it is desirable for easy entry of the bottles into the case that the bottles be separated by approximately the width of the partition members which must enter between the bottles, or at least be free to move to accommodate these partition members in order that easy, fast casing operation can be performed without injury to the case or to labels on the bottles.

The present invention has for one of its objects the provision of a casing station employing a bottle separator for separating the rectangular array of bottles fed thereto.

Another object of the invention is to provide a bottle spreader which is automatic in its operation and which is positive in its separation or provision for separation of an array of bottles.

Another object of the invention is to provide a bottle spreader at a casing station of the above type in which each row of bottles at the station are carried through by a split support so that a bottle and case lifter can pass up the slots thus provided and lift the bottles and the case thereon from the casing station.

Other objects and advantages will be apparent from the following description of a preferred embodiment thereof, in which:

Figure 1 is a fragmentary plan view showing a casing station incorporating the bottle spreader of the instant invention.

Figure 2 is a longitudinal sectional view taken along the line 2—2 in Figure 1 showing an array of bottles at the casing station before spreading thereof.

Figure 3 is a detail view taken in a plane indicated by the line 3—3 in Figure 2.

Figure 4 is a detail view taken in a plane indicated by the line 4—4 in Figure 2.

Figure 5 is a fragmentary plan view similar to Figure 1, but showing the bottle spreading element spread apart to provide the spacing between the bottles thereon.

Figure 6 is a view similar to Figure 2, but showing the bottles spread apart and a case inserted thereover.

Figures 7 through 11 illustrate a modified form of the invention.

Figure 7 is a fragmentary plan view showing a bottle spreader constructed to accommodate and work with a bottle and case lifting means.

Figure 8 is a sectional view taken on the line 8—8 in Figure 7 with the bottle spreader in closed condition.

Figure 9 is a fragmentary sectional view taken in planes indicated by the line 9—9 in Figure 7.

Figure 10 is a fragmentary plan view similar to Figure 7, but showing the bottle spreader in its separated condition.

Figure 11 is a fragmentary view similar to Figure 6 also showing the separated condition of the bottle spreader.

Referring to Figures 1 and 2, there is illustrated an embodiment of the invention including a casing station **20** to which parallel rows of bottles are fed in upright position by a conveyer **21**. The conveyer **21** is of conventional form and is trained about a driving drum **22** carried by a suitable drive shaft **23**. Suitable dividing rods or partitions **24** are supported above the conveyer **21** so that parallel rows of bottles are fed from the conveyer to the casing station **20**. At the discharge end of the conveyer **21** there is provided a transfer plate **26** suitably supported upon the frame **27** and carrying a support plate **28** which is also supported from the frame **27**. The support plate **28** carries a plurality of longitudinally extending rails **29** which extend across the transfer plate **26** and are in parallel relation with the partitions or rails **24** over the conveyer **21**.

A bottle supporting structure comprising a rectangular array of bottle spacers in the form of supporting and separating members or plates **31** are carried by the plate **28** to provide for support of a rectangular array of bottles or other containers in upright position. As seen in Figure 1, there are six plates **31** in each row and there are four rows so that this particular casing station is adapted to accommodate the casing of a twenty-four bottle case. In Figure 2, six bottles **33** of a row are shown in place on one row of the plates **31** and a seventh bottle of the row is seen on the transfer plate **26**. Feeding of the bottles is interrupted in each row by a stop **34** carried by a transverse shaft **36** which has a depending arm **37** at one end connected by a spring **38** to a lug **39** on the frame. The spring **38** serves to resiliently urge the series of stops **34** to active position where they overlap the endmost bottles **33**. The spring **38** is of sufficient strength to hold the bottles against the urgency or push of the oncoming bottles on the conveyer **21**. In each row between a pair of rails **29** the plate **28** is provided with a series of slots **32** to receive and guide a series of angle brackets **41** depending from the spreader plates **31**. The depending portion of each bracket **41** is apertured to receive a longitudinal control rod **42** having a series of collars **43** secured thereon along its length. It will be noted that the endmost collar **43** to the left in Figure 2 is in tight engagement with the bracket **41** being opposed by a nut **44**, so that the platform or support plate **31** associated therewith partakes of every movement of the rod **42**. The succeeding collars **43***a*, **43***b*, **43***c*, **43***d* and **43***e* are spaced from the associated angle brackets **41***a*, **41***b*, **41***c*, **41***d* and **41***e* by progressive steps, each step corresponding to the desired spacing apart of the containers for entry of the partition of the case.

From the above description, it will be seen that by movement of the rod **42** to the left in Figure 2, the leftmost angle or plate **31** will receive six increments of movement, the next support **31***a* will receive five increments of movement, the support plate **31***b* will receive four increments of movement, the support plate **31***c* three increments and so forth. The one step movement of the end plate **31***c* of a row provides for separation of the end bottle **33** from the adjacent bottle on the transfer plate **26**.

Before operation of the rods **42** and the collars **43** to effect the spacing of the bottles, it is necessary to arrest or stop any movement of the bottles remaining under the influence of the drive of the conveyer **21** which do not

form part of the case array. For this purpose a transverse series of stop pins **46** (Figures 1, 2 and 4) are provided (two in association with each row of bottles) engaging in aligned apertures in the transfer plate **26**. These stop pins **46** are carried by a transverse bar **47** supported adjacent its ends by respective guide pins **48** which carry stop nuts **49**; a pair of springs **51** about pins **48** urge the bar **47** and the entire set of pins **46** to their withdrawn position. To operate the stop pins **46**, a pair of operating arms **50** are pivotally mounted on the shaft **23** for the drum **22** and each arm **50** is pivotally connected at **52** intermediate its ends to a depending telescopic link **53** which is of a two-part construction capable of telescoping by yielding of its spring **54**. The lower end of each link **53** is pivoted at **56** to an arm **57** carried by a transverse shaft **58**. The shaft **58** carries an operating arm **59** which is connected to a foot-operated control lever **61**. The telescopic link **53** provides a lost motion connection which yields after the stop pins **46** have been moved to active position and the operating bar **51** therefore engages a stop formed by a frame angle **62**, while permitting continued movement of the operating shaft **58**.

The operating shaft **58** (Figures 1 and 2) also serves to operate the transverse array of spacing rods **42** and for this purpose carries a pair of upstanding arms **66** each having a pin **67** engaging in a slot **68** in the end of a link **69** connected to a transverse angle **70** secured to each of the rods **42**. The slots **68** provide a lost motion in the operating connections between the acuator shaft **58** and the rods **42** so that the stop pins **48** can be brought up into active position as shown in Figure 6 before any movement of the spacer or spreader plates **31** occurs. Continued movement of the actuator shaft **58** will move the plates **31** from the positions shown in Figure 2 thereof to the positions shown in Figures 5 and 6 where the bottles will be spaced apart to receive a case and the partition walls within the case. If a bottle for some reason should not move with its plate **31**, space is made available so that only individual shifting of the bottle need be effected to cause proper spacing thereof.

After placing of a case over an array of bottles, the bottles are moved to the left from the position shown in Figure 6 spanning a gap **71** and into a transfer plate **72** leading to a suitable feed conveyer carrying them to a suitable case closing station. In operation the stop bars **34** are moved to an inactive position by the endmost plates **31** as shown in Figure 6 to permit discharge movement of the case of bottles.

After the case of bottles has been removed, the operator releases the link **61** and the stop pins **48** are withdrawn to allow feeding of another array of bottles and the bottle supports or spreaders **33** are restored from their expanded condition to their contracted condition.

In the form of the invention illustrated in Figures 7 through 11, the bottle spreader is shown as constructed for use with a case lifting and inverting casing machine of the character shown in the copending application of Anthony R. Silva, Serial No. 290,864 filed May 31, 1952, for Casing Machine, to which reference is made for parts not specifically shown and described herein.

Referring to Figures 7, 8 and 9, in this form of the invention the casing station is constructed for a case of twelve bottles and is made up a series of channels **81** connected at their right ends by riveting to the transfer plate **26** and supported in extended position therefrom. The channels **81** are spaced apart to provide slots for the upward passage of a transverse series of case lifting and inverting bars **82** of the character shown in said application, carried upon a rotary drive shaft **83** and secured in spaced relation by tie bar and spacer means **84**. The arms **82** have corresponding sets of lift arms **82***a* extending oppositely therefrom and the shaft **83** is rotated through 180 degrees each casing operation as disclosed in said application.

Each channel **81** carries a series of spacer or spreader plates **86** below the separating rails **29** and carry depending angle pieces **41** apertured to pass an actuating rod **42**, the rod **42** carrying suitable space actuating collars as previously described. Each rod is individually spring urged to its right hand position as shown in Figure 8 by a spring **88** engaging the endmost angle bracket **41** at one end and at the opposite end engaging a shoulder **89***a* of a sleeve **89** secured by suitable screws to a transverse lug **91** welded between the flanges of the channel **81** (Figure 9). Each channel is also provided with a pair of stops **92** adjustably secured thereto to determine the position of the bottles at the casing station.

In this form of the invention, a series of actuating fingers **97**, one for each rod **92**, are carried by the shaft **58** and each finger **97** is normally spaced from the end of the associated rod **42** to provide the lost motion before beginning actuation of rods **42** to allow upward movement of the stops **48** to active position before beginning spreading movement of the plates **86**.

From the above description it will be apparent that each of the plates **86** extend to either side of a spacing rail **29** so that one-half of each plate cooperates with another half of an adjacent plate to provide a support for the bottle **33**. The operation of these spreader or spacer plates **86** is the same as that previously described in connection with the embodiment of Figure 1, and the placing of the case over the bottles in separated position as shown in Figures 10 and 11, is effected by the operator. Thereafter the drive for the shaft **83** is enabled and the lifting bars **82** operate to lift the bottles with the case thereon from the casing station and deposit the bottles in inverted position on a suitable conveyor as disclosed in said application.

While I have shown and described certain preferred embodiments of the invention, it will be apparent that the invention is capable of modification and variation from the form shown, so that its scope should be limited only by the scope of the claims appended hereto.

I claim:

1. In a bottle spreader for casing machines and the like, a frame, a casing station comprising bottle supporting structure including a rectangular array of bottle spacers, means mounting said spacers on said frame in parallel rows for movement longitudinally of the rows between an expanded position and a contracted position, dividing rails carried by said frame and extending longitudinally between said rows to separate bottles thereon, said structure presenting in the contracted position of said spacers of a row a surface constructed to support bottles during sliding movement of bottles along said row, spreading means connected to each row of bottle spacers, and means for operating said spreading means.

2. In a bottle spreader for casing machines and the like, a frame, a casing station comprising bottle supporting structure including an array of bottle spacers, means mounting said spacers on said frame for movement longitudinally of the rows between a contracted position in which bottles thereon are in closely spaced relation and an expanded position in which said bottles are in spaced apart relation, said structure presenting in the contracted position of said spacers a surface constructed to support bottles during sliding movement of bottles along said row, and means for controlling said mounting means to determine the expanded and contracted condition of said spacers.

3. In a bottle spreader for casing machines and the like, a frame, a casing station on said frame comprising bottle supporting structure including a row of bottle spacers, means mounting said spacers for movement on said frame to effect uniform spacing apart thereof, means for feeding a row of bottles to said spacers, bottle stop means normally disposed in inactive position at an end of said row of spacers for movement into the path of the bottle next adjacent the row of bottles on said spacers,

and thereby interrupt the feeding of bottles, and means for moving said stop means to active position to restrain said bottles on said feed means and for thereafter moving said bottle spacers to separate the row of bottles on said supports.

4. In a bottle spreader for casing machines and the like, a frame, a casing station on said frame comprising bottle supporting structure including a row of bottle spacers movably mounted at said casing station, means normally maintaining said spacers in contacting relation with each other, comprising a spring urged stop finger at one end of said row, means for feeding a row of bottles to said spacers at the other end of said row, bottle stop means normally disposed in engaging position at the other end of said row of spacers for movement into the path of a bottle on said feeding means to separate the bottles on said spacers from the bottles under the influence of said feeding means, and operating means for said row of spacers comprising an operating shaft having a row of collars secured thereon, there being one collar for each spacer in said row, and said collars being spaced with respect to said spacers by differential amounts to effect an even spacing apart of said row of bottle spacers upon operation of said operating means, and means for first moving said bottle stop means to active position and for thereafter effecting operation of said operating means.

5. In a bottle spreader for casing machines and the like, a frame, a casing station on said frame comprising bottle supporting structure including a row of bottle spacers movably mounted at said casing station, means normally maintaining said spacers in contacting relation with each other, means for feeding a row of bottles to said spacers at an end of said row, bottle stop means normally disposed in engaging position at said end of said row of spacers for movement into the path of a bottle on said feeding means to separate the bottles on said spacers from the bottles under the influence of said feeding means, operating means for said row of spacers comprising a row of spacing elements related to said spacers to effect an even spacing apart of said row of bottle spacers upon operation of said operating means, and means for first moving said bottle stop means to active position and for thereafter effecting operation of said operating means.

6. In a bottle spreader for casing machines and the like, a frame, a casing station for supporting an array of bottles in position for engagement of the case thereover including rail means for separating said bottles into rows and also including means engageable with said bottles to effect movement thereof to space said bottles apart longitudinally of said rows to receive between them the partitions of a case, and means for operating said bottle engaging means to effect movement of said bottles to positions in which said bottles are spaced apart.

7. In a bottle spreader for casing machines and the like, a frame, a casing station on said frame comprising bottle supporting structure including a row of bottle spacers, said row being split and each bottle spacer being formed into spaced apart halves, a bottle lift arm mounted at said casing station for upward movement between said split spacers, and spreading means connected to said bottle spacers for effecting spacing apart thereof to determine a corresponding spacing of bottles supported thereon, said spreading means determining a spacing apart of the bottles on said support structures to receive the partitions of a case inserted thereover in inverted position.

8. In a bottle spreader as recited in claim 7 in which means is provided for feeding a row of bottles to said support structure including a row of bottle spacers, and bottle stop means is provided for interrupting the feed of bottles to said row prior to operation of said spreading means.

9. In a bottle spreader as recited in claim 3 having a split construction of each spacer whereby an opening is provided in the row of spacers for upward movement of a lifting means to engage the bottles with a case thereon and lift them from said support structure.

10. A bottle spreader as recited in claim 3 having a second bottle stop means at the other end of said row of spacers and normally positioned in the path of movement of bottles therefrom, and means incident to operation of said bottle spacers to effect separation thereof for disabling said second bottle stop means.

11. In a bottle spreader for casing machines and the like, a frame, a casing station on said frame comprising a bottle supporting structure constructed to support bottles thereon for sliding movement therealong, said structure including a row of bottle spacers, means mounting said spacers for movement on said frame to effect uniform spacing apart thereof, means for feeding a row of bottles to said spacers at one end thereof, means on said frame for receiving bottles from the other end of said row, bottle stop means normally disposed in active position at the feed end of said row of supports for movement into the path of the bottle next adjacent the row of bottles on said support structure, and thereby interrupt the feeding of bottles, second bottle stop means at the discharge end of said row normally positioned to interrupt the feed of bottles thereacross, and means for simultaneously moving said first named stop means to active position, said second named stop means to inactive position, and also for thereafter moving said bottle spacers to separate the row of bottles on said support structure.

References Cited in the file of this patent

UNITED STATES PATENTS

1,503,452 Fuller ---------- July 29, 1924