United States Patent [19]

Hartness et al.

[11] **3,911,647**

[45] **Oct. 14, 1975**

[54] **POSITIONING ARM FOR CASE LOADER**

[76] Inventors: **Thomas P. Hartness**, 305 Bridgewater Drive; **Robert G. Hartness**, 203 Wilmington Road, both of Greenville, S.C. 29602

[22] Filed: **Jan. 23, 1974**

[21] Appl. No.: **435,715**

[52] **U.S. Cl.** **53/248**; 53/262

[51] **Int. Cl.**[2] **B65B 39/02**

[58] **Field of Search** 53/248, 262, 247; 193/32, 193/40

[56] **References Cited**

UNITED STATES PATENTS

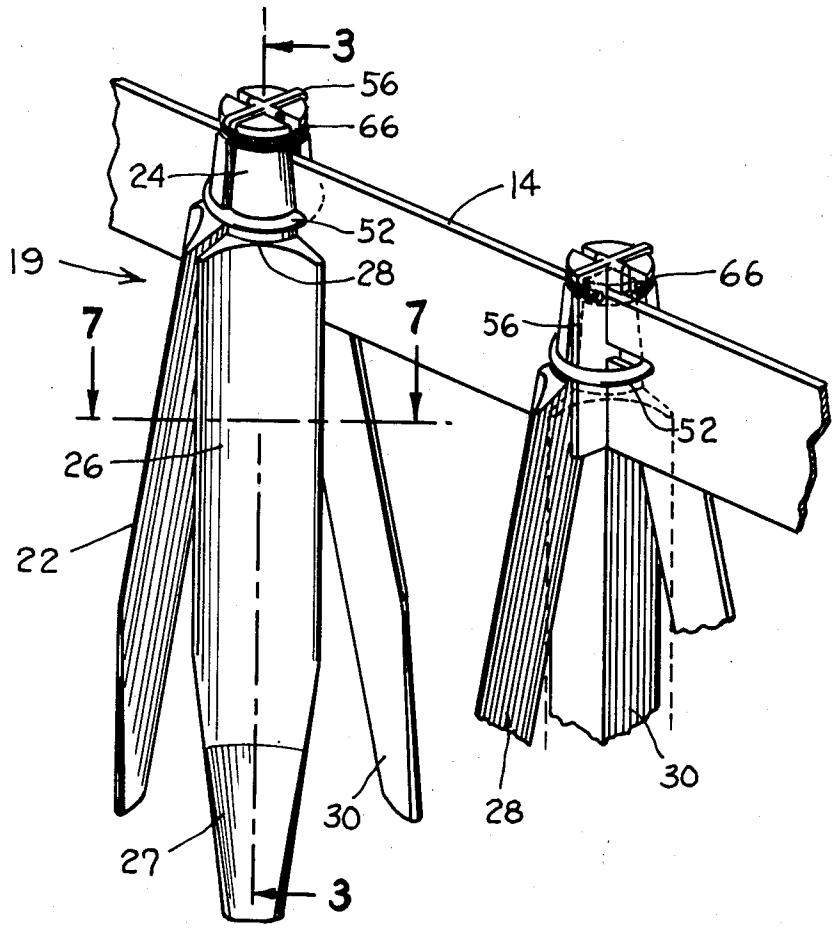
2,753,673	7/1956	Olive	53/248 X
3,271,928	9/1966	Wild	53/248
3,273,308	9/1966	Hoette	53/248 X
3,325,967	6/1967	Wild	53/262
3,553,932	1/1971	Rowekamp	53/247 X
3,788,034	1/1974	Hartness et al.	53/248

Primary Examiner—Robert L. Spruill
Assistant Examiner—Leon Gilden
Attorney, Agent, or Firm—Bailey & Dority

[57] **ABSTRACT**

A positioning arm for use in a grid set on an article loading machine wherein articles such as bottles are loaded from aligned rows carried above a grid set into cases carried below the grid set. The positioning arm includes an elongated member which has an arcuate inner surface for engaging a surface of the bottle as the bottle passes through passages for loading into the case. Positioning arms are carried in each corner of the passages.

7 Claims, 7 Drawing Figures



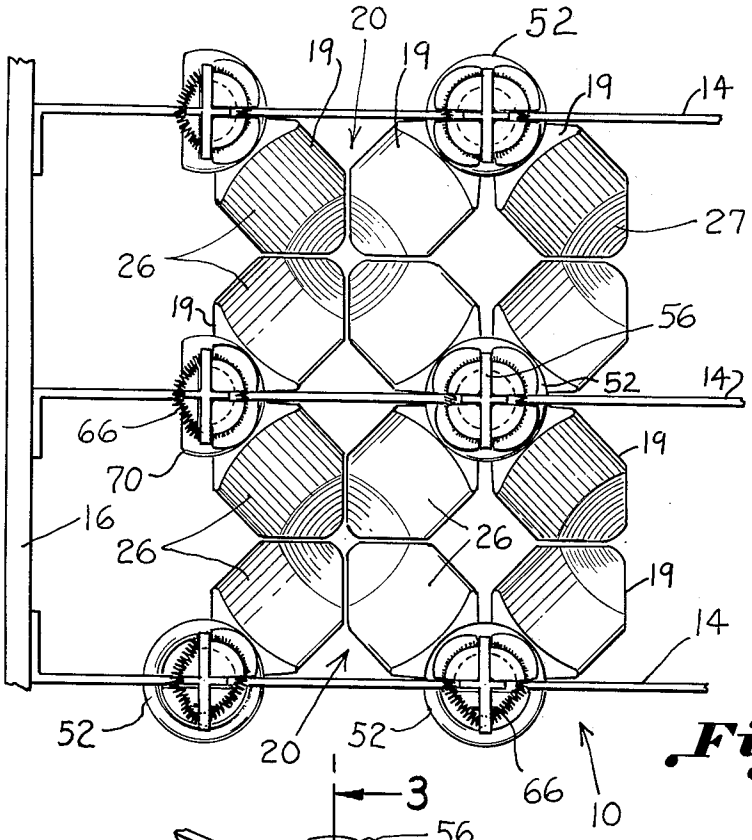

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Fig. 1.

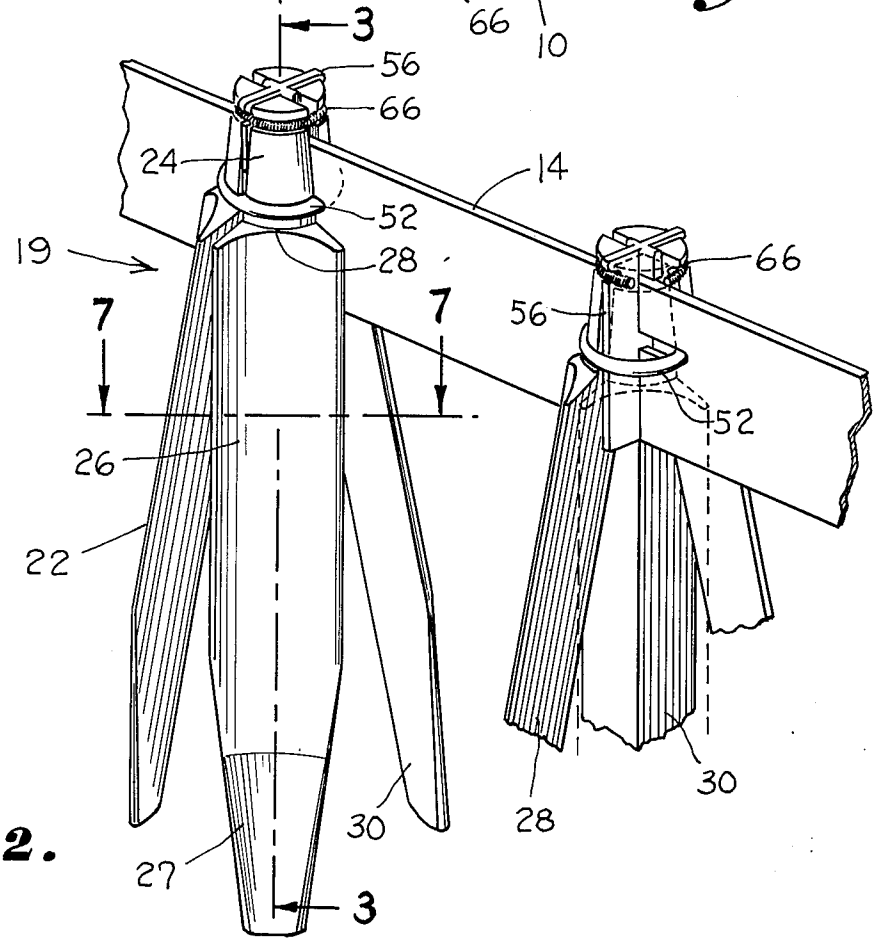

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Fig. 2.

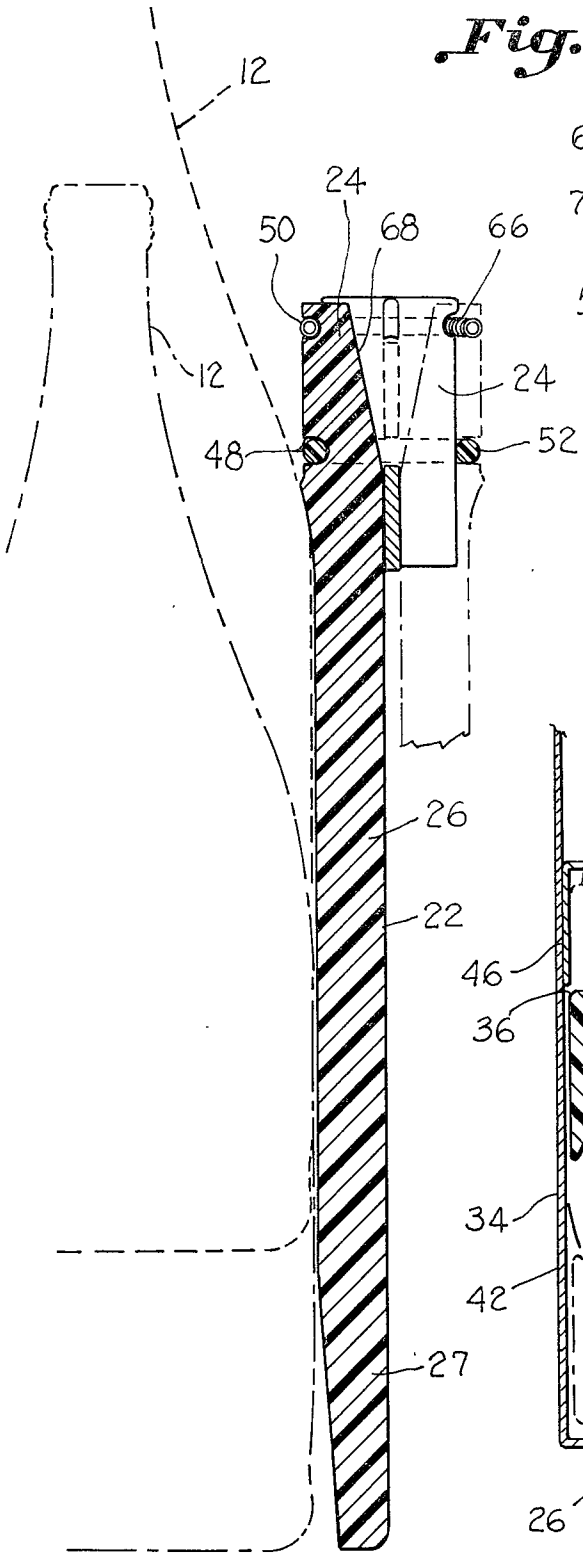


Fig. 3.

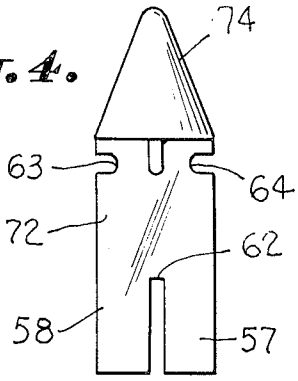


Fig. 4.

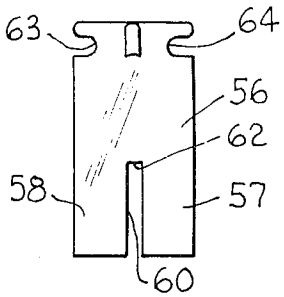


Fig. 5.

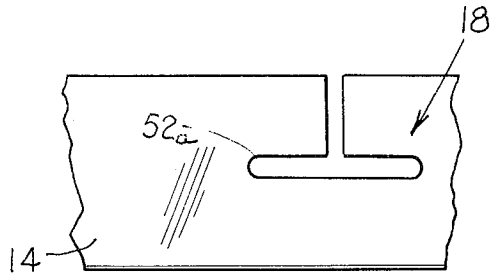


Fig. 6.

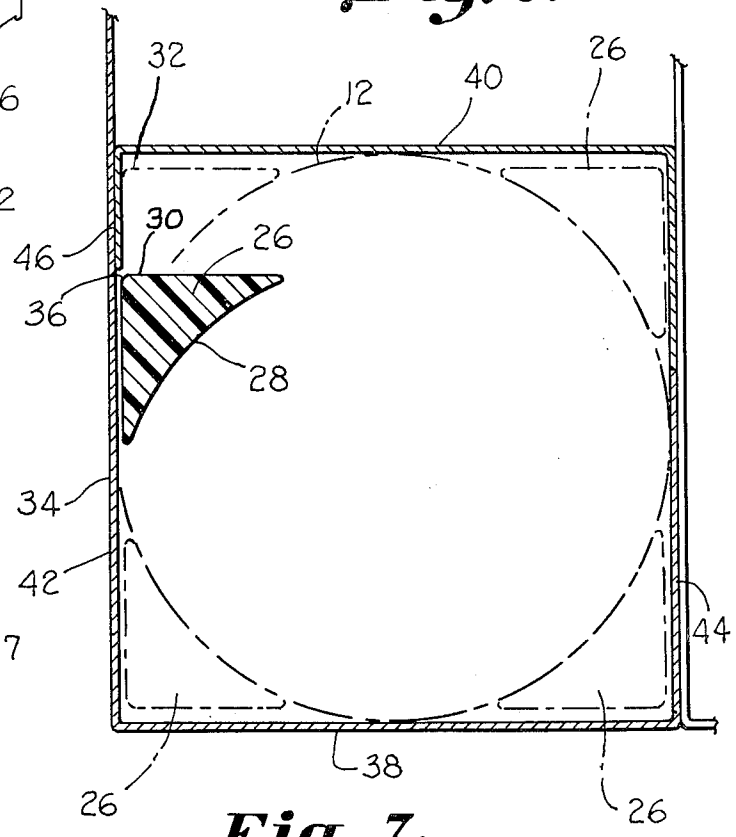


Fig. 7.

POSITIONING ARM FOR CASE LOADER

BACKGROUND OF THE INVENTION

This invention relates generally to a positioning arm and more particularly to a positioning arm for use in a grid set of a case loading machine.

In grid sets presently utilized with bottle loading machines normally flexible fingers are utilized for engaging the bottles as they pass therethrough for properly positioning the bottles into cases and also into cartons carried within cases. One problem with such thin flexible fingers is that they are placed adjacent the side walls of the case and sometimes do not release the bottles as the loaded case is lowered to be shifted onto a receiving conveyor. Examples of flexible grid fingers heretofore utilized are illustrated in U.S. Pat. No. 2,713,448 granted to Wimmer, et al., and U.S. Pat. No. 2,540,743 granted to Leach. Other types of case packing apparatus are disclosed in U.S. Pat. No. 3,481,108 granted to Englander, et al. and U.S. Pat. No. 3,555,770 granted to Rowekemp.

In our copending patent application entitled "Grid Set For An Article Loading Machine" which will issue on Jan. 29, 1974, and obtain U.S. Pat. No. 3,788,034, a grid set is illustrated for use on a bottle loading machine. The grid set includes a plurality of arms which are carried in the corner of passages for engaging bottles as such are loading into cases. The arms, as illustrated, are constructed of rod-like members.

SUMMARY OF THE INVENTION

The invention is for a positioning arm used in a grid set for an article loading machine wherein articles such as bottles and the like are loaded from aligned rows carried above the grid set into a case or cartons carried below the grid set. The grid set includes a plurality of elongated spaced members being spaced apart sufficiently for allowing the articles to pass therebetween. A plurality of positioning arms are supported on the elongated spaced members for defining passages through which the articles pass for loading into the case. The positioning arms include an elongated member having an upper portion, a main body intermediate portion and a lower portion. The main body portion has an elongated arcuate inner surface for engaging a surface of the article as the articles pass through the passages for guiding the article into the case. The rear side of the elongated member opposite the arcuate surface has a right angle shape so as to permit the elongated member to be forced into a corner of the passage by the article passing through the passageway. The apex of the right angle shaped rear side is rounded so as to ride over any rough surfaces in the case when the positioning arm is being forced into the corner.

Accordingly, it is an important object of the present invention to provide a rugged and reliable positioning arm for use in grid sets for loading articles into cartons and cases.

Another important important object of the present invention is to provide a positioning arm which is provided with means for biasing a lower end thereof towards the center of a passageway for retarding the movement of bottles and the like as such are loaded into cases.

Still another important object of the present invention is to provide a positioning arm which is utilized in a grid set for insuring that individual compartments of cartons provided for receiving bottles and the like are properly open for receiving the articles.

Still another important object of the present invention is to provide a grid set used for loading articles into cases with a deflector means which insures the loading of articles into proper compartments of cases.

These and other objects and advantages of the invention will become apparent Upon reference to the following specification, attendant claims and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a fragmentary, planned view illustrating a grid set constructed in accordance with the present invention,

FIG. **2** is an enlarged, perspective view illustrating positioning arms mounted on an elongated member forming part of the grid set,

FIG. **3** is a cross-sectional view taken along lines **3—3** of FIG. **2**,

FIG. **4** is an enlarged, side elevational view illustrating one type of partition forming part of the grid set that is positioned in a slot illustrated in FIG. **6**,

FIG. **5** is an enlarged, side elevational view illustrating another type of partition forming part of the grid set that is positioned in the slot illustrated in FIG. **6**,

FIG. **6** is an enlarged, side elevational view illustrating a portion of an elongated member forming part of the grid set, and

FIG. **7** is a sectional view taken along line **7—7** of FIG. **6** illustrating various positions of the elongated arm during the loading of a bottle into a case.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring in more detail to FIG. **1** of the drawings, there is illustrated generally by the reference character **10** a portion of a grid set that may be used for loading articles such as bottles into a case or cartons carried within the case. One such bottle loading machines is illustrated in our copending application which is about to issue as U.S. Pat. No. 3,788,034. Bottles **12** are carried in aligned rows above the grid set **10** for being dropped through the grid set **10** into a case or cardboard cartons carried directly therebelow. Normally, there are four rows of bottles with six bottles in each row, making a total of 24 bottles to be loaded into a case.

The grid set **10** includes a plurality of elongated spaced members **14** which are attached by the ends of cross members **16** as by welding. The elongated spaced members **14** have spaced slots, generally designated by the reference character **18,** as shown in FIG. **6** provided along the length thereof for accommodating positioning arms **19** so as to define a grid having a plurality of square passages **20** therein. The positioning arms **19** include an elongated member **22** constructed of any suitable material, such as molded nylon. The elongated member **22** has an upper portion **24,** a main body intermediate portion **26** and a lower portion **27.** The main body portion **26** has an arcuate shaped inner surface **28** which corresponds generally to the curvature of the article or bottle being loaded into the case. The arcuate surface **28** extends downwardly from adjacent the upper portion **24** to the bottom of the lower portion **27.** The lower portion **27** of the elongated member **26** is inclined outwardly at an angle of approximately 3° so that if the bottle **12** bounces when being loaded into a case,

such will not scratch a label carried on the surface of the bottle **12.**

A rear side of elongated member **22** opposite the arcuate surface **28** has a right angle shape **30** so as to permit the elongated member to be forced into a corner **32** of a carton or case **34** as the bottle **12** passes through a passage **20.** The right angle rear side **30** has an apex **36** which is rounded to a 1/16 inch radius so as to ride over any rough surfaces in the case as such is being forced into the corner **32** thereof.

As seen in FIG. **7,** there is illustrated a portion of a conventional cardboard carton **34** which is normally used for transporting six drink bottles. The carton includes opposed side walls **38** and **40** which are joined by side walls **42** and **44.** The side wall **40** has an inwardly turned flange **46** which is glued to the side wall **42** in constructing the carton. It is important not to break this connection when the bottles **12** are being loaded into the carton. The rounded apex **36** of the elongated member **22** permits the elongated member **22** to ride over the flange **46** when such is being forced into the corner of a carton as the bottle is being loaded in that respective compartment. Only one compartment of a carton is illustrated in FIG. **7,** since such is a conventional item. Frequently, the cardboard cartons **34** are not fully extended to properly define the compartments for receiving the bottles, and as a result, another advantage of utilizing the subject positioning arms **19** is that they properly extend the compartments of the carton **34** when being forced into the corners **32.**

The upper portion **24** of the positioning arm **19** has a pair of curved spaced slots **48** and **50** provided therein. A locking ring **52** is carried in the slot **48** for attaching the positioning arm **19** to the elongated member **14.** The elongated member **14** (see FIG. **6**) has spaced inverted T-shaped slots **52** provided therein.

The passages **20** are defined by four of the positioning arms **19** mounted on the elongated members **14** in the corner thereof. In the inner portion of the grid set, four of the positioning arms **19** are mounted at each junction with each one of the positioning arms **19** being carried in a different passage **20.**

The positioning arms are attached to the elongated members **14** by use of a partition **56** such as shown in FIG. **5.** The partition **56** has a pair of downwardly extending legs **57** and **58** which define a slot **60** therebetween having an upper surface **62** provided between the legs **57** and **58.** Positioned adjacent the upper end of the partition **56** are a pair of inwardly extending opposed slots **63** and **64.** In assembling the positioning arms **19** on the elongated members **14,** the ring **52** is first placed into the base of the T-shaped slot **52***a*. Four of the positioning arms **19** are positioned circumferentially around the slot **18** on the elongated member **14** with the upper ends **24** thereof carried within the ring **52** so that the ring **52** enters the slot **48** thereon, such as shown in FIGS. **2** and **3.** The partition **56** is then positioned at right angles to the elongated member **14** with the legs **57** and **58** extending downwardly on opposite sides of the elongated member inside the ring **52.** The partition **56** is forced downwardly until the upper end of the slot **62** engages the bottom of the inverted T-slot **52***a*. A circular spring **66** is slipped over the upper ends **24** of the positioning arms **19** and the partition **56** into the slot **50** provided in the upper ends of the positioning arms **19.**

Since an outer surface **68** of the upper ends of the positioning arms **19** are inclined inwardly, the spring **66** causes the lower ends **27** of the positioning arms to pivot inwardly to the center of the respective passage that such is carried as best illustrated in FIG. **1.** On the side of the grid set such as shown in FIG. **1,** instead of using a complete circular ring **52,** a D-shaped ring **70** is utilized since only two of the positioning arms are secured thereto. In the corners such as shown in the left hand corner in FIG. **1,** sometimes a spacer corresponding to the upper portion **24** of the positioning arm **19** is inserted in the quadrant where no positioning arm is desired so as to insure proper locking of the positioning arm **19** to the elongated member **14.**

In operation, the bottles are fed in rows directly above the grid set **10** and by means not shown, dropped simultaneously through the grid set. The bottom of the bottle **12** engages the arcuate surfaces **26** of the positioning arms **19** forcing such outward to the corner of the passages. The lower ends **27** of the positioning arms **19** are also forced into the corner of the case or carton being loaded. Since the elongated members **22** are spring biased inwardly, such tends to lower the bottles gently into a particular compartment in the case. Sometimes the bottle bounces, therefore it is desirable to have an inclined surface **27** on the bottom of the elongated member **22** so as to prevent the label carried on the bottle from being scratched by the positioning arm **19.**

On some case loading machines, it is desirable to have a deflector means on top of the junction where the four positioning arms **19** are coupled to the elongated member **14** so as to direct the bottles into the appropriate passages. In FIG. **4,** a modified form of the partition **56** is illustrated as partition **72** and includes a cone-shaped member carried on top of the partition which overlaps the upper end of the positioning arm **19** when assembled. If bottles are being fed through the passages engage the cone-shaped portion **74** it deflects the bottle **12** towards the appropriate passages **20.**

While a preferred embodiment of the invention has been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit or scope of the following claims.

What is claimed is:

1. A positioning arm for use in a grid set on an article loading machine, wherein articles such as bottles are loaded from aligned rows carried above said grid set into a case carried below said grid set, said grid set including a plurality of elongated spaced members being spaced apart sufficiently for allowing said articles to pass therebetween, a plurality of said positioning arms being supported on said elongated spaced members for defining passages through which said articles pass for loading into said case, each of said positioning arms being carried in a respective corner of a passage, resilient means engaging said positioning arms for pivoting a lower end of said positioning arms towards the center of said passages, said positioning arm comprising:

an elongated member having an upper portion, a main body intermediate portion and a lower portion,

said main body portion having an elongated arcuate inner surface for engaging said surface of said articles as said articles pass through said passages for loading into said case, and

a rear side of said upper portion of said elongated member opposite said arcuate inner surface being inclined inwardly defining a pivot point at the junction of said main body portion and said upper portion,

whereby said lower end of said positioning arm can be pivoted towards and away from said center of said passage for guiding said articles therethrough.

2. The positioning arm as set forth in claim **1** wherein a rear side of said elongated member opposite said arcuate surface has a right angle shape so as to permit said elongated member to be forced into a corner of said passage by said article passing through said passage.

3. The positioning arm as set forth in claim **1** wherein said lower portion of said elongated member is inclined rearwardly from said intermediate position so as not to engage a surface of said article when said article bounces in said case during loading.

4. The positioning arm as set forth in claim **2** wherein said right angle shaped rear side has an apex which is rounded so as to ride over any rough surface in said case when being forced into a corner of said passage by said article passing through said passage during loading into said case.

5. A grid set for use on a bottle loading machine having means for positioning bottles in aligned rows above said grid set and means for positioning empty cases below said grid set, the improvement comprising: a plurality of elongated spaced members being spaced apart sufficiently for allowing said bottles to pass therebetween, guide members spaced along said elongated members defining passages through which said bottles pass for loading into said cases, said guide members including elongated downwardly extending arms carried adjacent the corners of said passages, resilient means for biasing lower ends of said arms inwardly towards the center of said passages for engaging said bottles as said bottles are dropped from said aligned rows through said passages into said case, said arms having an elongated arcuate inner surface for engaging a surface of said bottles as said bottles pass through said passages, and means for pivotally supporting said elongated arms in corners of said passages;

whereby the movement of said bottles passing through said passages is retarded as said arms are pivoted into said corners when said bottles engage said arms while being loaded into cases.

6. The grid set as set forth in claim **5** further comprising:

a deflector means carried above said elongated arms at said corners of said passages for directing said bottles into said passages.

7. The grid set as set forth in claim **6** wherein said deflector means in a cone-shaped member with a small diameter end extending upwardly directly above said corner of a passage.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,911,647

DATED : October 14, 1975

INVENTOR(S) : Thomas P. Hartness and Robert G. Hartness

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 2, please insert:

--This is a continuation-in-part of application, Serial Number 240,542, filed on April 3, 1972, Patent No. 3,788,034--

Column 1, line 28, Please cancel the word "loading" and substitute therefor: --loaded--.

Column 2, line 8, please cancel the word "Upon" and substitute therefor: --upon--.

Column 2, line 39, please cancel the word, "machines" and substitute therefor: --machine--.

Column 4, line 38, please delete the word "are".

Column 4, line 39, please cancel the word "bottle" and substitute therefor: --bottles--.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,911,647

DATED : October 14, 1975

INVENTOR(S) : Thomas P. Hartness and Robert G. Hartness

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 6, line 26, please cancel the word "in" and substitute therefor -- is --

Signed and Sealed this

Eighteenth Day of January 1983

[SEAL]

Attest:

GERALD J. MOSSINGHOFF

Attesting Officer

Commissioner of Patents and Trademarks