Nov. 25, 1969 A. J. WILD 3,479,791

STOP MEANS FOR PACKING EQUIPMENT

Filed May 7, 1968 3 Sheets-Sheet 1

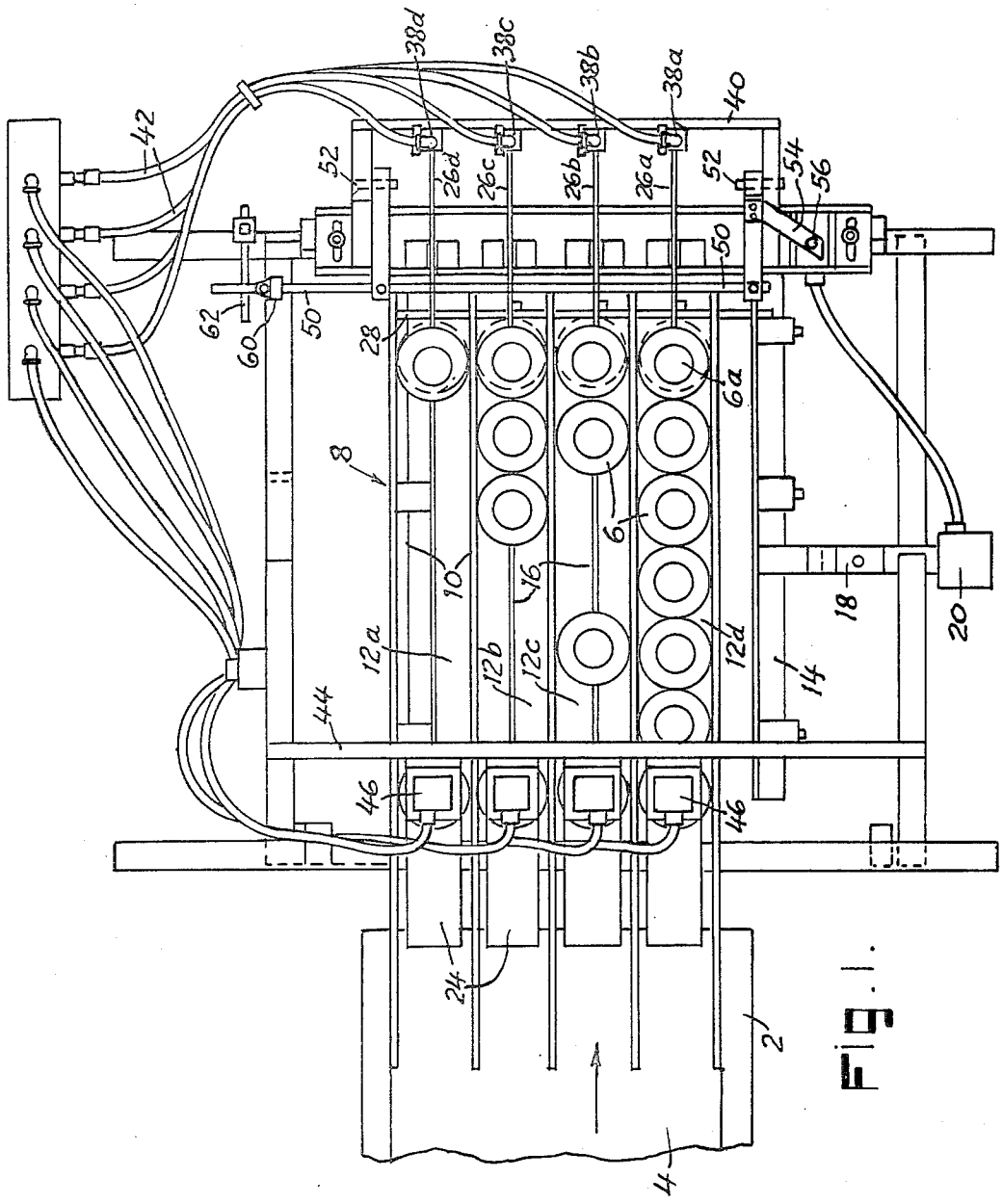


Fig. 1.

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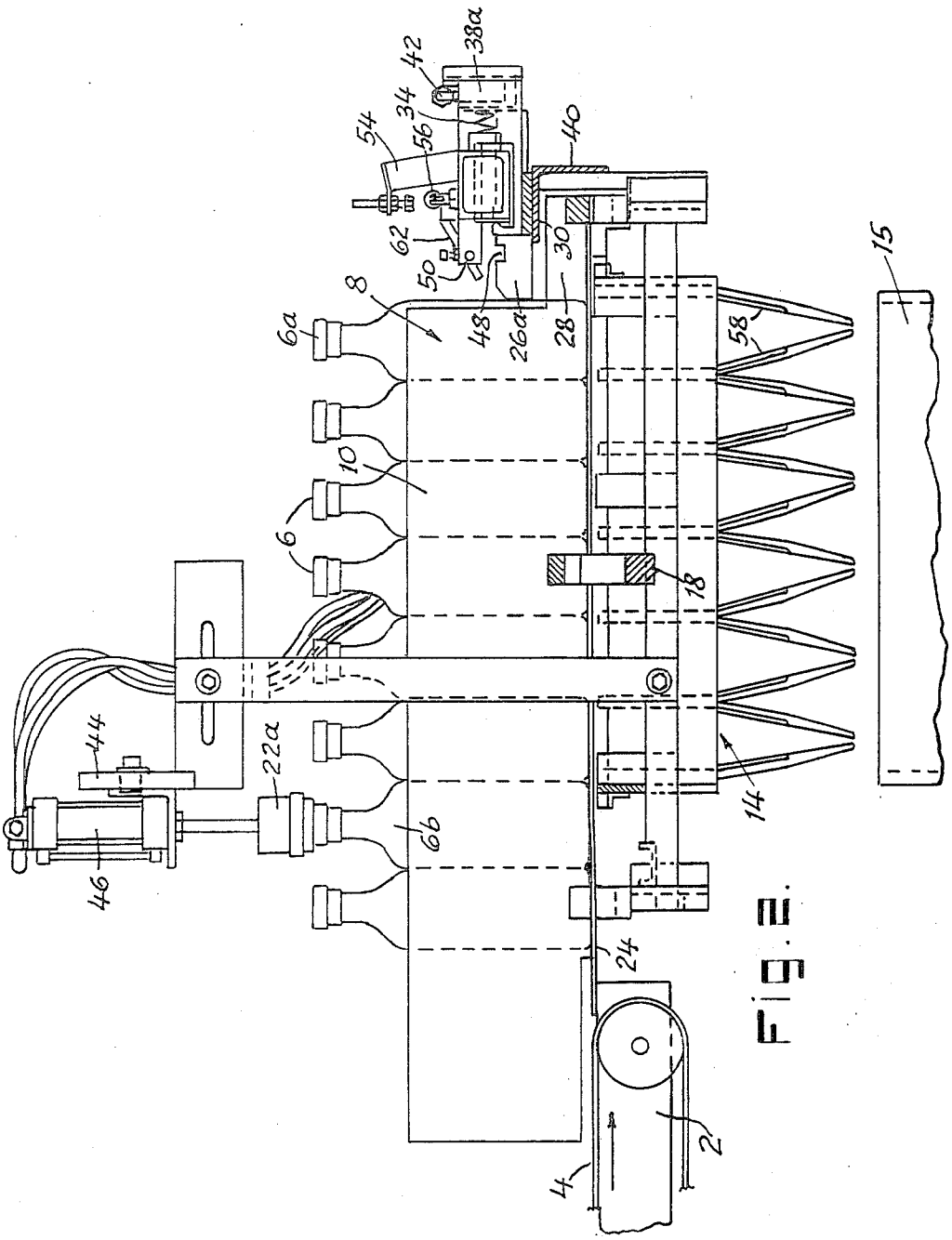


Fig. 3

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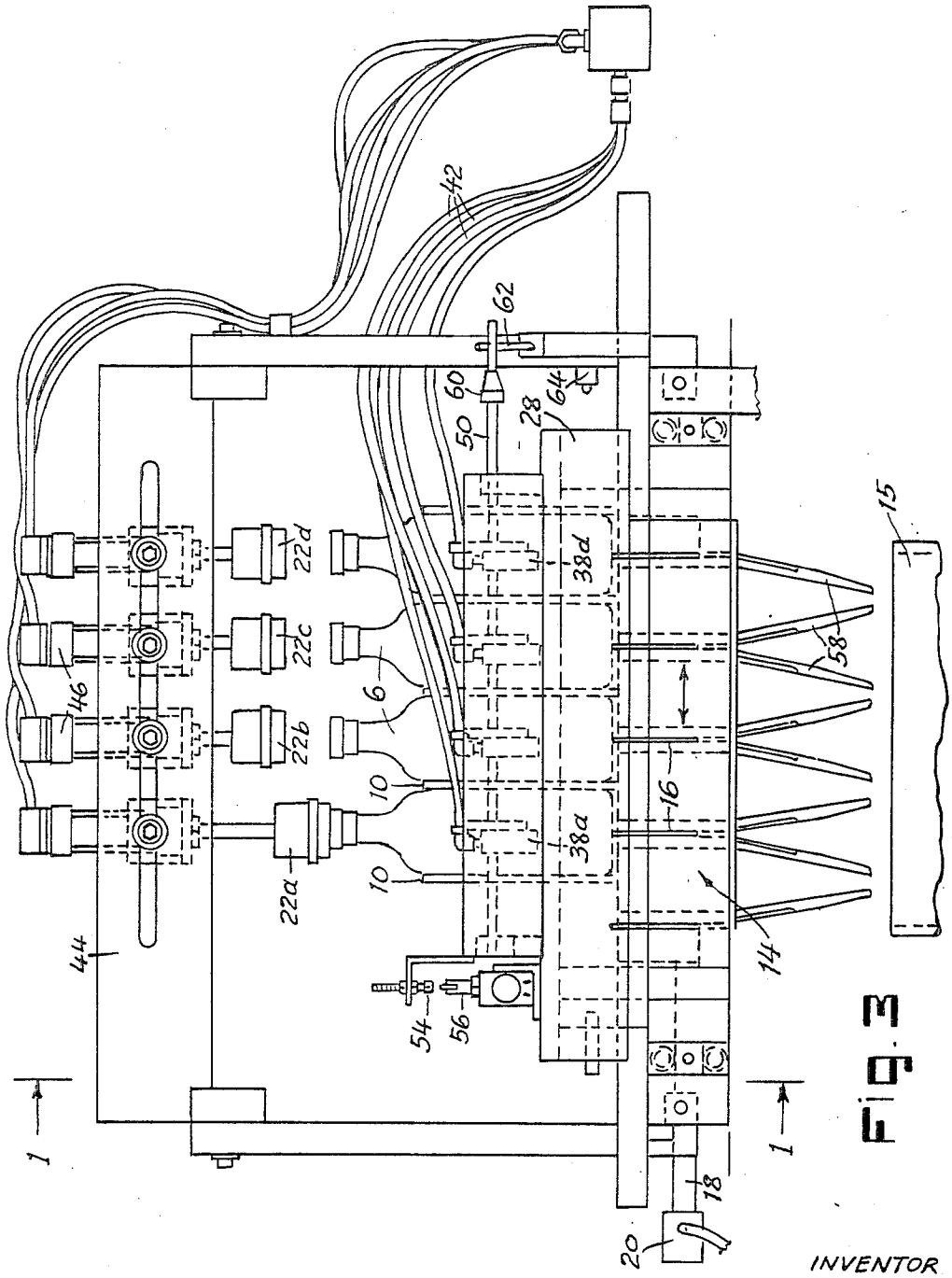


Fig. 3

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STOP MEANS FOR PACKING EQUIPMENT

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Int. Cl. B65b 57/10
U.S. Cl. 53—61 6 Claims

ABSTRACT OF THE DISCLOSURE

Equipment for packing articles in cases wherein article feeding means advance articles into channels in a packing head and onto article supporting strips carried by a packer grid. Sensing means in each channel are individually actuated when a full complement of articles fills that channel to prevent the article feeding means from pushing additional articles against those already filling the channel. Crowding, displacement and distortion of articles in the channels is thereby eliminated. When all channels are filled with the proper number of articles, the article supporting strips are moved to cause the articles to be transferred from the packing head to a case.

Related application

This application is a continuation-in-part of copending application Ser. No. 631,756 but the invention also is adapted for use in equipment such as that shown and described in U.S. Patent No. 3,325,967, for example.

Field of invention

This invention is directed to equipment for packing articles, such as bottles, cans and the like, in a predetermined arrangement in a case or other receptacle and is designed particularly to relieve the articles being arranged from the "line pressure" of articles being fed into the packing equipment whereby crowding and displacement of previously arranged articles is prevented.

It is common practice to provide packing equipment with a packing head having a plurality of parallel channels therein into which the articles to be packed are moved by article feeding means. When each channel in the packing head is properly filled with articles, some form of feeler means or sensing device is operated to cause the articles to be transferred from the packing head into a case or receptacle. However, in order to assure proper discharge of articles from the packing head and prevent crowding, displacement and distortion of the articles in the channels by additional articles being advanced by the article feeding means, some form of stop means or article holding device is frequently located adjacent the end of the article feeding means or the entrance to the channels in the packing head.

The stop means heretofore provided for this purpose have not been actuated until all of the channels in the packing head have been filled with articles. However, the articles do not always move into the various channels in the same manner so as to fill all of the channels simultaneously and in the same way. As a result one channel may be filled with articles before another is filled and the articles in a channel which has already been filled may be crowded, displaced or distorted by the continuing line pressure exerted thereon by the article feeding means in urging additional articles into contact with those already filling the channel. This situation becomes particularly troublesome when packing such articles as large and heavy plastic bottles or fragile articles or containers which may be distorted when crowded and may even be punctured or broken if they are forcibly pressed against each other or against a feeler means or other element projecting into a channel in the packing head.

In accordance with the present invention this objection is overcome by providing individual stop means associated with each channel to prevent articles from being urged into a channel already filled with articles.

The drawings

FIGURE 1 is a top plan view of a typical construction embodying the present invention;

FIGURE 2 is a side elevation of the construction illustrated in FIGURE 1;

FIGURE 3 is an end elevation of the construction shown in FIGURE 1 as seen from the right hand end of FIGURE 1.

Preferred embodiments

In that form of the invention chosen for purposes of illustration in FIGURES 1, 2 and 3 of the drawings, the equipment has a frame **2** supporting article feeding means such as a conveyor **4**, which serves to advance the bottles or other articles **6** from a suitable source of supply to a packing head **8**. The packing head is provided with a plurality of parallel stationary dividers **10** which define parallel channels **12***a*, **12***b*, **12***c*, etc. into which the articles are moved by the article feeding means **4**. As shown in FIGURE 1, the packing head **8**, has four channels **12** and the channels are of such length that it will require six bottles or articles to fill each channel. When all of the channels are thus filled with articles, the articles will be arranged in an orderly manner for transfer to a case or other container **15**.

A packer grid **14** is located beneath the packing head **8** and is provided with longitudinally extending parallel article supporting strips **16**, which are normally positioned beneath the channels **12** so as to support the articles **6** as they are moved into the channels by the article feeding means. The packer grid **14** and article supporting strips **16** are preferably movable transversely of the channels **12** under the action of a piston **18** or the like which may be controlled by an air cylinder **20** or other suitable means as disclosed in copending application Serial No. 631,756. When thus moved, the articles filling the channels **12***a*, **12***b*, etc. and arranged in an orderly manner, are allowed to move downwardly by gravity through the packer grid **14** and into a case or container **15** located beneath the packer grid.

It is found in practice that when articles are fed into the channels of a packing head by article feeding means such as the conveyor **4**, one or more of the channel **12***a*, **12***b*, **12***c*, etc. may be filled with articles before another channel is completely filled. Thus, the conveyor or article feeding means is generally driven continuously whereas the articles on the conveyor may be displaced and interfere with one another as they are moved toward the channels causing delays or clogging of the articles adjacent the entrance of one channel. At the same time the filling of other channels with articles may take place promptly and without any such interference. Under such circumstances, the article feeding means will continue to push additional articles against the articles in those channels which are already filled tending to cause the previously arranged articles to be displaced, distorted or jammed within the channels in a manner to interfere with the subsequent discharge or transfer of the articles from the packing head to the container **15**.

In accordance with the present invention this difficulty is overcome by providing individually operable article holding means **22***a*, **22***b*, **22***c*, etc., associated with each of the channels **12***a*, **12***b*, **12***c*, etc. in the packing head. These article holding means are each operable to engage an article moved onto a supporting plate **24** adjacent the entrance to the channel to prevent it from being urged further forward by the article feeding means and against

the articles already filling the channel. For this purpose, a separate feeling means or sensing device **26***a*, **26***b*, **26***c*, etc. is located in each channel adjacent the closed end **28** of the channel so as to be engaged and operated by the foremost article in the channel when the channel has been filled.

The feeler means illustrated in the drawings are in the form of elements such as fingers which are slidably movable on a plate **30** and with respect to the end member **28** of the movable packer grid **14**. The fingers are yieldably urged inwardly toward the channels by springs **34** to positions wherein the inner end of each finger **26** will be engaged by the foremost article **6***a* in the channel as it approaches the end member **28** of the packer grid **14**. Thereafter, upon further movement of the foremost article into the channel under the action of the article feeding means **4**, it will move to its final position shown in dotted lines in FIGURE 1 and corresponding to complete filling of the channel with articles arranged in the proper positions for discharge from the packing head. During the latter movement of the foremost article **6***a* in its channel, it will push the finger **26** outward against the action of the spring **34**. At the same time the outer end **36** of the finger **26** will be moved into engagement with a control device **38***a*, **38***b*, **38***c*, etc. associated with that channel. The control device is preferably an air valve mounted on a bracket **40** secured to and movable with the packer grid **14**.

Each control device **38***a*, **38***b*, etc. is connected by an individual air line **42** or the like to a corresponding holding means **22***a*, **22***b*, **22***c*, etc. mounted on a stationary support **44** and located above an article positioned on the supporting plate **24** adjacent the entrance to the channels. The holding means preferably is in the form of a vertically movable plunger which is movable downward under the action of an air cylinder **46** into engagement with the top of a bottle or article **6***b* located on the plate **24** and beneath the plunger. Therefore, when the control device **38** associated with any channel is actuated by the finger **26** in that channel, the corresponding air cylinder **46** will be actuated to move its article holding means downward into engagement with the top of the article **6***b* beneath the same so as to press the article down against the support plate **24**. The article **6***b* adjacent the entrance to that channel will then be prevented from being moved farther forward by the article feeding means **4** in a manner to press against the articles already arranged in the channel. On the other hand, the article holding means are each arranged to prevent the continued forward movement of only that article which is adjacent the entrance of a channel which is already filled with articles and will not prevent the advance of other articles into other channels of the packing head **14**.

The fingers **26**, as shown in FIGURE 2 of the drawings are each provided with a notch or recess **48** spaced from the inner end of the finger. These notches are positioned in alignment when all of the channels in the packing head have been filled with articles and all of the fingers **26** have been moved outward against the action of the springs **34** and into engagement with the control devices **38**. A bar **50** extends transversely of the channels above the fingers **26** and is pivotally mounted at **52** so that it may be moved downwardly into the aligned notches **46** under the action of gravity. A microswitch, air valve, or the like **56** is positioned to be engaged by an arm **54** connected to the bar **50** on downward movement of the bar to cause the air cylinder **20** and piston **18** to be actuated to move the packer grid **14** transversely of the channels in the packing head. The article supporting strips **16** of the packer grid are thereby moved from beneath the arranged articles in the channels **12** so as to permit the articles to move downward past the article guiding fingers **58** carried by the grid **14** to effect the transfer of the articles to the case or other receptacle **15** under the action of gravity.

In this way the equipment serves to assure the continued feeding of articles into all of the various channels of the packing head until all of the channels have been completely filled. At the same time the equipment also serves to prevent crowding, distortion or displacement of the articles within the filled channels and relieves the articles of the "line pressure" resulting from continued operation of the article feeding means in advancing articles into unfilled channels. Moreover, the equipment is controlled so as to preclude movement of the packer grid and article supporting strips **16** to discharge articles from the packing head to the case **15** until all channels have been completely filled and the articles have been properly arranged and are free of line pressure which might interfere with such discharge.

The bar **50** has a cam element **60** carried thereby and positioned to engage a lifting member **62** upon transverse movement of the packer grid **14** and the elements associated therewith. In this way the bar **50** will be raised as the packer grid reaches the end of its transverse movement and the sensing fingers **26** will again be projected inwardly by the springs **34** so as to restore the elements to their active positions for a renewed cycle of operations. At the same time the grid **14** on reaching its article discharging position will engage a micro switch or other device **64** which serves to release the plungers or elements of the air cylinders **20**, **46** and **38** and restore the packer grid and other operational devices to their original positions to permit a further complement of bottles or articles to be received and arranged for packing in another case.

The form and construction of the packing head and packer grid can be varied as desired, but as shown and described above, the packer grid and article supporting strips are formed as a movable unit which are operable in the manner set forth in applicant's copending application, S.N. 631,756. In this construction the sensing elements control devices and related elements are all mounted on and movable with the packer grid. However, the invention is equally applicable to constructions of the type disclosed in applicant's issued Patent No. 3,325,967 wherein the packer grid and article guiding fingers are held in fixed positions with respect to the channels in the packing head and only a control frame which carries the articles supporting strips is moved transversely to effect the discharge of articles under the control of sensing elements engageable by the foremost article in each channel.

It will be apparent that other embodiments and modifications of the present invention are possible.

I claim:

1. Equipment for packing articles in containers comprising a packing head having stationary dividers defining a plurality of parallel channels, feeding means for moving articles to be packed into said channels, a packer grid, article supporting means associated with the packer grid and located beneath said channels, said article supporting means being movable into and out of position to support articles moved into the channels by said feeding means, a separate sensing element associated with each of said channels and movable to a predetermined position by the foremost article in said channels when the channel is filled with articles, a separate article holding means associated with each of said channels and positioned to engage an article located adjacent the entrance to such channel to prevent further movement thereof toward said channel by the article feeding means, the article holding means associated with each channel being actuated upon movement of the sensing element associated with that channel to said predetermined position, and means operable when all of said sensing elements have moved to said predetermined positions to move said article supporting means out of said position wherein they support articles in said channels so as to effect the transfer of articles from said packing head to a container.

2. Equipment as defined in claim **1** wherein there is an article supporting plate located adjacent the entrance

to each of said channels and said article holding means are individually movable downward into engagement with an article located beneath the same and on said plate to prevent said feeding means from continuing to urge articles toward those articles filling said channels.

3. Equipment as defined in claim 1 wherein said packer grid and article supporting means are movable together transversely of said channels into and out of an article supporting position, and means responsive to movement of all of said sensing elements to said predetermined positions operable to move said packer grid out of said article supporting position so as to effect the transfer of articles from the packing head to a receptacle.

4. Equipment as defined in claim 1 wherein said sensing elements are carried by said packer grid.

5. Equipment as defined in claim 1 wherein said sensing elements are in form of elements yieldably urged into positions wherein the inner ends thereof project into said channels and the outer ends thereof are movable into position to actuate control means upon movement of an article into engagement with the inner end of the finger, said control means each being connected to one of said article holding means to actuate the same.

6. Equipment as defined in claim 5 wherein said elements each have a part thereon which are moved into alignment when all of said channels have been filled with articles, and a member actuated upon alignment of said parts to cause said article supporting means to be moved out of said article supporting position.

References Cited

UNITED STATES PATENTS

3,052,071	9/1962	Copping	53—62
3,353,331	11/1967	Rowekamp	53—61 X

TRAVIS S. McGEHEE, Primary Examiner