

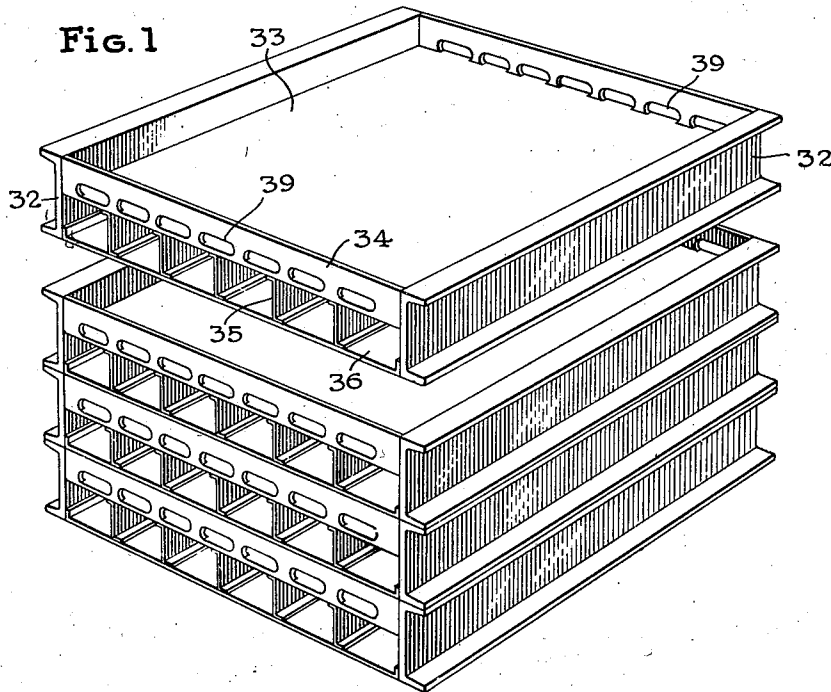
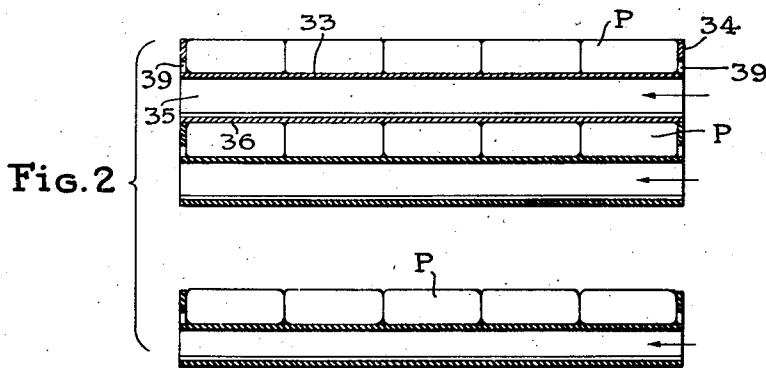
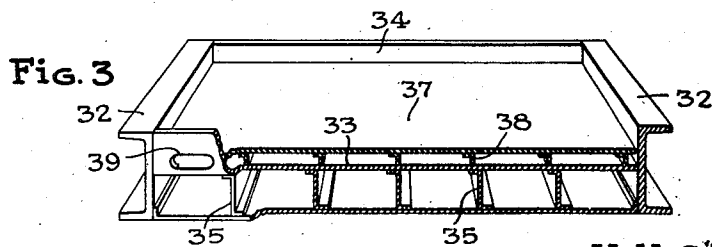
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TRAY FOR FOOD FREEZING APPARATUS

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TRAY FOR FOOD FREEZING APPARATUS

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2 Claims. (Cl. 62-1)

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This invention relates to trays for use in freezing packaged food products.

The tray is intended primarily for use in the freezer described and claimed in my pending application, Serial No. 657,001 filed March 25, 1946, of which application the present application is a division directed to the subject matter of Figures 18, 19 and 20 of the parent application.

In the parent application there is described a machine in which a plurality of trays rest upon one another in a stack and are moved upward by a reciprocating lift which acts upon the lowermost tray in the stack and pushes the stack up until the bottom tray latches in an elevated position. Then the lift retreats to admit the next tray. The trays themselves form transverse air ducts, each duct being above material in one tray and below material in the next. After each upward excursion of the stack, a tray of frozen material is pushed from the top of the stack and a tray of unfrozen material is pushed in beneath the lowermost tray of the stack and above the reciprocating lift.

Freezing is effected by circulating refrigerated air through the stack and the path of this air is preferably in one direction through the upper portion of the stack and in the opposite direction through the lower portion, the refrigerated air making a U-shaped pass first through the upper portion of the stack and then back through the lower portion.

The machine can be used for freezing products in bulk but it is also adapted to freeze products enclosed in packages and the tray here described and claimed is used for the latter purpose.

The tray is so contrived that the packages are confined between parallel plates during freezing and consequently are prevented from swelling and warping during the freezing operation. Each tray provides a definite space in which a layer of packages is confined by a false bottom carried by the next higher tray.

The invention will now be described by reference to the accompanying drawing, in which:

Fig. 1 shows a stack of three trays constructed in accordance with the invention with a fourth tray spaced above the stack so as better to illustrate its construction.

Fig. 2 is a section through a stack of trays showing the confined packages and the air passages.

Fig. 3 shows one of the trays of Figs. 1 and 2 with a spacing bottom or filler plate in the tray.

Such a tray has channel bar sides 32 and a plate

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bottom 33 bent up to form ends 34. The bottom 33 is at about mid-height of the sides 32 and is spaced by Z-bar stays 35 from a false bottom 36. All parts are welded together. The packages to be frozen are laid on the bottom 33 and the passages between bottom 33 and false bottom 36 are for the passage of air. The Z-bars 35 assist in producing a rigid structure.

As indicated in Fig. 2, the packages P should be so dimensioned as to approximate in thickness the depth from the top of side 32 to the top of bottom plate 33. They can desirably be slightly more, or a little less, in which event they are permitted a slight swell before contact is established with the false bottom 36 of the superposed tray. Waxed paper packages such as are customary in the frozen food industry can be frozen without sticking to a contacting false bottom 36. Hence, an overlying tray can safely be slid off after the freezing operation. This fact is important because actual contact improves the heat transfer and can be had without imposing unreasonably close limits on package depth.

The essential thing is that when the package starts to swell it will be restrained sufficiently to assure a rectangular package which will pack satisfactorily in cartons.

With the preferred dimensions, when package filled trays are stacked, as indicated in the upper portion of Fig. 2, the false bottom rests on and compresses slightly the layer of packages P supported by the next lower tray.

To permit the use of the same set of trays to freeze thinner packages the arrangement shown in Fig. 3 may be used. This comprises a removable filler plate 37 with longitudinal ribs 38 on its lower face to space the plate above bottom plate 33. Ports 39 in ends 34 are then desirable to permit refrigerated air to flow between bottom 33 and the filler plate 37.

It should be understood that when these trays are used in the machine of the parent application, they are loaded and emptied by hand. While the trays are particularly intended for use in the machine of the parent application, they are obviously available for other uses. For example, they can be used in any freezing machine in which packages are frozen while mounted in stacked trays, the weight of a single tray being sufficient to confine the packages in the next lower tray and resist swelling and warping thereof.

What is claimed is:

1. A tray for use in stacked relation with other substantially identical trays, for freezing pack-

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aged material under sufficient confinement to maintain the form of the package, said tray comprising two parallel plates spaced apart to afford between them a passage for air at sub-freezing temperatures; and side bars connected to and serving to space said plates and to sustain the load of other trays stacked thereon while preserving a fixed inter-tray package-receiving interval between the upper plate of one tray and the lower plate of the tray next above it.

2. The combination with a tray of the type defined in claim 1 of a filler plate for reducing the inter-tray package-receiving interval, said filler plate overlying the upper plate of the tray,

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and having in its lower face spacers serving to preserve an interval for air flow beneath the filler plate.

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The following references are of record in the file of this patent:

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