MOVABLE DECK FOR A TOP-OPENING FREEZER


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Primary Examiner—William J. Wye

ABSTRACT

A freezer having a deck supported by a frame that is biased toward the freezer opening by a torsion bar connected to the frame.

6 Claims, 6 Drawing Figures
MOVABLE DECK FOR A TOP-OPENING FREEZER

BACKGROUND OF THE INVENTION

In the use of chest-type freezers having a top opening, it is difficult for short users to retrieve a small package resting upon the freezer floor.

In order to solve this problem, freezers with counterbalance rising decks were developed, such as shown in U.S. Pat. No. 2,306,385-Herter. Rising decks biased by coil springs have been utilized in other applications as shown in U.S. Pat. No. 3,418,031-Fisher.

Neither of these constructions, however, provided a structure that had a very limited number of moving parts, was of simple construction, and which in the depressed condition did not waste relatively large amounts of space.

SUMMARY OF THE INVENTION

In accordance with this invention, a top-opening chest freezer has an improved movable support frame for a rising bottom deck. A plurality of frame members are pivotally attached at their ends. Torsion bar means have their respective ends attached to the ends of different ones of said frame members for biasing the deck toward the top opening of the freezer.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view in partial section of the apparatus of this invention;

Fig. 2 is a diagrammatic perspective view of an embodiment of a portion of this invention;

Fig. 3 is a diagrammatic perspective view of another embodiment of a portion of this invention;

Fig. 4 is a diagrammatic perspective view of yet another embodiment of a portion of this invention; Fig. 5 is a sectional view of a lower leg of the frame of this invention; and

Fig. 6 is a sectional view of another embodiment of the lower leg.

DETAILED DESCRIPTION OF THE INVENTION

In the embodiment of Fig. 1, a freezer 10 has a top opening 12 and a freezer floor 14, a deck 16 is positioned over said floor 14. The deck is smaller than the dimensions of the freezer floor for positioning the deck within the freezer. The deck can be of generally solid construction or can be formed of wire mesh or of a network of rods, for example.

The deck is supported in the freezer 10 by a movable frame 18. The frame 18 is constructed of first and second rectangular frames 20, 22 pivotally connected one to the other at frame ends 24, 26 (better seen in Fig. 2) for forming a frame 18 of X configuration as viewed from an end of the frame 18. Each of the rectangular frames 20, 22 can be formed of a metal rod.

The rectangular frames 20, 22 are pivotally connected at about the midpoint of the associated ends, thereby forming a frame 18 having first and second upper legs 28, 30 and first and second lower legs 32, 34. As better seen in FIGS. 2-4, the pivotal connections 35, 37 can be spools 39, 39', each fixedly connected to one of the rectangular frames 22 with the other rectangular frame 20 being connected to the spools 39, 39' by elements 41, 41' that are each slidably movable about the respective spool 39, 39'.

The upper legs 28, 30, contact, support, and are movable along the deck 16. The lower legs 32, 34 contact and are movable along the freezer floor 14 for raising and lowering the deck 16 in response to pivotal movement of the rectangular frames 20, 22.

A torsion bar 36 has first and second ends 38, 40 connected to the first and second rectangular frames 20, 22 for biasing the deck toward the top opening 12 of the freezer cabinet.

In the embodiment of FIG. 2, the first end portion 38 of the torsion bar 36 is connected to the first end of the frame 18 and the second end portion of the torsion bar 36 is connected to the second end of the frame 18. In this embodiment, the torsion bar is generally linear. The torsion bar 36 can be secured to the frame 18 by any means which securely fastens the torsion bar ends to the frame in a manner precluding movement of the bar-ends relative to the frame 18 during pivotal movement of the frame.

In the embodiment of FIG. 3, there are a plurality of torsion bars 36, 36', and 36''. As can be seen, one of the torsion bars 36 is connected to an upper leg 30 of the frame 18 and another torsion bar, 36' for example, is connected to a lower leg 34 of the frame 18 on a common side and at a common end of the frame 18.

In FIG. 3, the distances along the rectangular frames 20 and 22, from the pivotal connections 35 and 37 to the points at which the ends of the torsion bars 36, 36', and 36'' are connected to the frames, have been exaggerated for clarity of illustration. In operation, as the frame 18 is lowered, due to the geometry of the frame 18, the points on the frames 20 and 22 at which the ends of each of the torsion bars 36, 36', and 36'' are connected tend to moved farther apart, thereby subjecting the torsion bars 36, 36', and 36'' to a tensile force, in addition to the desired torsional force. The practical result of the tensional force is a deforming of the rectangular frames 20 and 22, rather than an elongation of the torsion bars 36, 36', and 36''. If the distances from the pivotal connections 35 and 37 to the ends of torsion bars 36, 36', and 36'' are sufficiently short, there will be minimal tensional force and thus minimal deforming of the rectangular frames 20 and 22. For example, if the length of the legs 32 and 34 is 36 inches, and the distance from the pivotal connections 35 and 37 to whichever torsion bar end is farthest away is 2 inches, the deformation required is less than 0.1 inch, an amount which the rectangular frames 20 and 22 can easily accommodate.

A plurality of torsion bars can be utilized where heavier loads are expected to be placed on the deck 16. One skilled in the art can easily select the dimensions, strength, and number of torsion bars after it is decided what unit weights will be generally carried by the deck 16.

It will be noticed that at full depression of the frame 18 with the deck 16 immediately adjacent the freezer floor 14, the torsion bars 36, 36', 36'', lie generally on a horizontal plane P, do not cross one another, and thereby require less space than a helical spring positioned under the deck. As can be seen in FIG. 3, the torsion bars will lie along their respective dotted lines (36), (36'), and (36'').

In the embodiment of FIG. 4, the torsion bars 36 are each of a modified V configuration and the first and second ends 38, 40 of the torsion bars are each connected to the frame 18 at a common frame end. Further, the torsion bar is connected to either the upper 28, 30 or lower 32, 34 legs of the frame 18, or to both, as shown.
Referring to FIGS. 5 and 6, protrusions 46 can be provided on one or more of the lower legs 32, 34 of the frame 18. The protrusions extend downwardly into contact with the floor 14 for reducing the friction during movement of the frame portion along the floor 14. The protrusion 46 can be a small rim extending downwardly from the leg (FIG. 5) or, as shown in FIG. 6, can be an annular roller, for example a roller bearing.

Other modifications and alterations of this invention will become apparent to those skilled in the art from the foregoing discussion, and it should be understood that this invention is not to be unduly limited thereto.

What is claimed is:

1. In a top-opening chest freezer, an improved movable support frame for a rising bottom deck, comprising:
   a plurality of frame members pivotally attached at their ends; and
   a torsion bar means having their respective ends attached to the ends of different ones of said frame members for biasing the deck toward the top opening of the freezer.

2. Apparatus, as set forth in claim 1, wherein the ends of the torsion bar are connected to the same end of the frame.

3. Apparatus, as set forth in claim 1, wherein one end of the torsion bar is connected to one end of the frame and the other end of said torsion bar is connected to the other end of the frame.

4. Apparatus, as set forth in claim 3, wherein one end of the torsion bar is connected to an upper leg of the frame and the other end of the torsion bar is connected to a lower leg of the frame.

5. Apparatus, as set forth in claim 4, including a plurality of torsion bars, each frame member having at least one torsion bar connected to an upper leg of the frame and another torsion bar connected to a lower leg of the frame on a common side of a plane passing perpendicularly through the pivotal connection of the frame.

6. Apparatus, as set forth in claim 1, including spaced-apart protrusions extending downwardly from a lower leg of the frame for contacting the freezer floor.
UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,926,001
DATED : December 16, 1975
INVENTOR(S) : William M. Webb

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

On title page, column 1, after "[76] Inventor: William M. Webb, Louisville, Ky." insert a new line:
--[73] Assignee: General Electric Company, Louisville, Ky.--

Signed and Sealed this twelfth Day of July 1977

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks