(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 321 859 A2**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **88120974.6**

(51) Int. Cl.[4]: **B65D 19/12**

(22) Date of filing: **15.12.88**

(30) Priority: **23.12.87 IT 2320187**

(43) Date of publication of application:
28.06.89 Bulletin 89/26

(84) Designated Contracting States:
BE DE ES FR GB IT

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(54) Collapsible palletizing container.

(57) The container has a metallic base frame (1) which can be raised by means of fork-lift trucks. A bottom grid (4) rests on tubular elements and is fixed to the structure by means of clamps or U-bolts (5). Walls (9,9a,11 ,11a) made of a metal grid are pivoted to the sides of said frame; the longer or front ones (9,9a) are pivoted at a higher level than the head or lateral ones (11 ,11a) so that they can collapse until they stack on top of one another in a pack on said bottom. Hook elements (19) are furthermore provided along the vertical sides of the larger walls and are directed towards the inside of the container to constitute abutment and retention means for the sides of the head walls. A clamp device (20), mounted on the horizontal rods of the head walls, locks the outer vertical rod of each head wall within the hook (19) of the abutment means. An outwardly curved fork element (15) at the top of the larger walls retains the base frame when the containers are stacked; at the top of the head walls there is at least one pair of opposite fork elements (16), the innermost whereof accommodates within a slot correspondingly provided in the base of the frame of the superimposed container to inwardly retain said container.

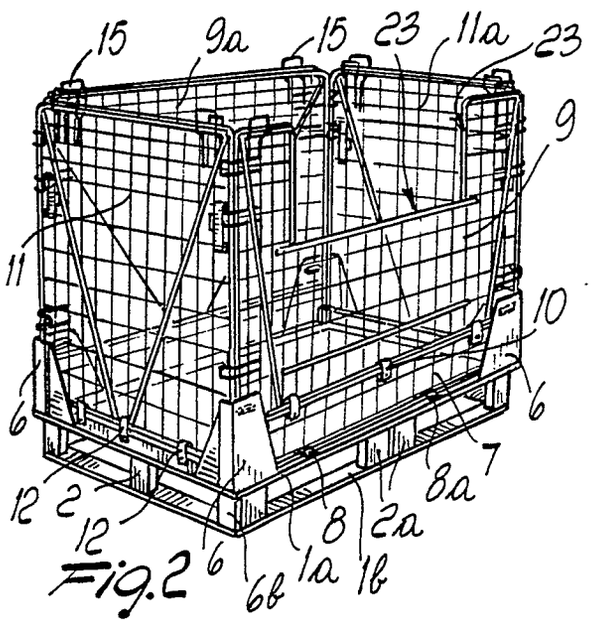

Fig. 2

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COLLAPSIBLE PALLETIZING CONTAINER

The present invention relates to a collapsible palletizing container for products packaged in boxes or packs which is constituted by metallic grid walls or sides coupled to a base frame so that said walls are collapsible onto said base frame to reduce the vertical dimensions of the container and stack a plurality of containers with their walls collapsed during storage and transport when empty.

Palletizable containers are already known and in widespread use, especially in supermarkets which sell food and miscellaneous products packaged in large boxes or similar packages; such containers have walls made of a grid of metallic rods coupled to a base frame, which is also metallic and has the shape of a pallet, i.e. a double frame so that the forks of fork-lift trucks can be inserted therein.

Such known containers are normally in the shape of a parallelepiped with a rectangular base and are upwardly open, with a bottom constituted by crosspieces arranged so as to constitute quadrangular meshes in order to minimize weight or by a grid of metallic wire. Said containers furthermore have elements arranged above the walls and protruding from the edges thereof; said elements are curved so as to constitute means for retaining the containers when they are stacked on top of one another.

One of the larger metallic grid walls furthermore normally has a reduced-height part or band which is folded outwards until it affects the lower fixed part of said wall, in order to easily unload the products with no danger of weakening the walls or of causing the product to accidentally fall out of the container.

In practice, though they satisfactorily achieve their aim of containing large amounts of products and of being stackable to reduce their bulk in storage, known containers with rigid walls made of grids of metallic rods have however several disadvantages and limitations which significantly affect their transport and storage costs.

The rigid walls in fact entail the disadvantage that the container maintains the same bulk or volume both when it is full and when it is empty, causing considerable problems in transporting them and storing them when empty.

Furthermore, when many loaded containers are stacked on top of one another, the stability of the stack is not always perfectly ensured, since the fork-like or ring-like retention elements provided on the upper edge of the four walls are not capable of providing the perfect stability of the upper container on top of the lower one, due to the slight but unavoidable yielding of said retention elements after prolonged use, since said retention elements are provided merely to prevent outward lateral movements; this yield causes an uncontrollable relative movement among the stacked containers.

The aim of the present invention is therefore to provide a palletizable container with walls made of grids of metallic rods for transporting and storing packaged and/or loose products, structured so as to obviate all the disadvantages and limitations of known containers of the same type and most of all capable of significantly reducing the costs of transporting and storing it when it is empty, though said container maintains the usual characteristics of stability, non-deformability and practicality in use.

Within the scope of the above described aim, an object of the invention is to provide a parallelepipedal container of the above specified type which is easy and rational to manufacture and assemble, slightly reduced in weight with respect to known containers of equal capacity and most of all having means which make the containers safely and durably stable when they are stacked.

Not least object of the invention is to provide a container which can be manufactured with conventional and easily available materials and has a cost which is assuredly competitive with that of known containers.

This aim, these objects and others which will become apparent hereinafter from the following description are achieved by a collapsible palletizing container of the type with metal grid walls, particularly for transporting and storing packaged products, stackable on top of identical containers, characterized in that it comprises a base frame which can be lifted by means of the forks of fork-lift trucks and has vertically protruding corner elements at its corners and a bottom made of tubular elements welded to the wall tubes, a bottom grid resting on said tubular elements and being fixed to the structure by means of U-bolts, walls made of rod grids being pivoted to the sides of said frame; the larger or front walls being pivoted at a higher level than the head or lateral ones so that they can be collapsed until they stack in a pack onto said bottom by initially collapsing the head walls and successively collapsing the larger walls onto said head walls; along the vertical sides of the larger walls there are hook elements which are directed towards the inside of the container and are adapted to constitute abutment and retention means for the sides of the head walls after they have been lifted to their vertical position to open; a clamp device is provided at at least one of said abutment and retention means and is mounted on horizontal rods

of the head walls and locks the outer vertical rod of each head wall within the hook of said abutment means, thus ensuring the stable mutual coupling of the four walls; at the top of the larger walls there is at least one outwardly curved fork element for outwardly retaining the base frame when containers are stacked; at the top of the head walls there is at least one pair of retention elements, in particular opposite forks, the innermost whereof accommodates within a slot correspondingly provided in the base of the frame of the superimposed container to inwardly retain said container.

The invention is described hereafter in greater detail according to a preferred but not exclusive embodiment, with reference to the accompanying drawings, given only by way of non-limitative example, wherein:

figure 1 is an exploded view of the container according to the invention;

figure 2 is a perspective view of the assembled container of figure 1;

figure 3 is a partially sectional top view of the container of figure 2;

figure 4 is a sectional view taken along the line IV-IV of figure 3;

figure 5 is a view of two containers according to the invention with their walls collapsed onto their bottoms and arranged stacked on top of one another;

figure 6 is a perspective view of a pair of retention forks for stacking two containers with vertically arranged walls;

figure 7 is a sectional view of figure 6 with the corner portion of a base frame inserted between the two forks;

figure 8 is a plan view of the arrangement of a base frame between the retention forks provided on a larger wall and on the head wall which is contiguous to said larger wall;

figure 9 is a perspective enlarged scale view of a clamp device;

figure 10 is a top view of the approaching elements to be clamped;

figure 11 is a top view of the clamp device of figure 9.

With reference to the above described figures, and in particular to figures 1 to 4, the container according to the invention is constituted by a rectangular metal base frame 1 (figure 1) constituted by two identical sub-frames 1a-1b superimposed and spaced by uprights 2, 2a etc.; crosspieces 3 are arranged between the sides of the upper subframe 1a to stiffen and support a bottom 4 constituted by a quadrangular-mesh grid made of metal rods. Said bottom 4 is rigidly coupled to the crosspieces 3 by means of U-bolts 5 arranged astride a rod of the base grid 4 and fixed to said crosspieces as shown in figures 3 and 4.

L-shaped corner elements are coupled to the four corners of the base frame 1 to stiffen the frame and retain the walls against outward deformations thereof, as will become apparent hereinafter; ledges or protrusions 6a are provided inside the L-shaped corner elements 6 and constitute stop means for the angular feet 6b of the base frame when a container (with its walls collapsed as will be specified hereafter) is stacked on top of an underlying one.

A grid of metal rods 7 is stably coupled between each pair of corner elements provided on the longer sides of the rectangular base frame 1 and is fixed to the elements of the sub-frame 1a by means of U-bolt clamps 8-8a etc. arranged astride the lower rod and coupled to the upper face of said sub-frame 1a. The height of the grid 7 is smaller than the height of the corner elements 6 so that it does not extend beyond said resting ledges, and reinforcement expansions 7a-7b (figure 1) are provided at the ends of each grid 7 and are coupled to the inside of the corner elements 6.

Walls 9 and respectively 9a are pivoted to the upper horizontal rod 7c of each opposite fixed grid 7 and constitute the two opposite larger front walls; pivoting is achieved by means of U-bolt clamps 10 arranged astride the rods 9b of the wall and astride the rod 7c of the related fixed grid 7; the ends of said clamps are then fixed with known means below the lower rod 7c. With this pivoting, the front walls 9-9a can be collapsed onto one another inside the container (figure 5). Two lateral or head walls 11 and 11a are pivoted to the shorter sides of the upper sub-frame 1a of the frame by means of U-bolts 12 arranged astride the lower rod of said walls and coupled to the opposite lateral faces of the crosspiece of the sub-frame 1a. The head walls 11-11a are thus pivoted at a lower level with respect to the level of the front ones 9-9a, so that the walls are collapsed by initially collapsing the two walls 11-11a onto the bottom 4 and then collapsing the walls 9-9a onto the walls 11-11a; when the walls are collapsed, the thickness created by the stack of superimposed walls (figure 5) is lower than the height of the stop ledges 6a of the corner elements 6, so that another container with collapsed walls can be stacked without damaging the walls of the underlying container.

The walls 11-11a and 9-9a are also made of metallic grids of a known type; the upper horizontal side of the walls is made of twin rods (9b-9c and 11b-11c); the outermost sides 11c and respectively 9c of said walls extend in a direction which is substantially diagonal to the respective walls until they couple to the respective lower horizontal rods of said walls at the points 13 and respectively 14 (figure 1).

Said diagonally arranged rods constitute useful means for stiffening the grid against lateral flexing due to the load stored in the container.

Two forks or rings 15 are coupled to the top of the larger walls 9-9a and are constituted by a portion of metal rod folded in a ring so that the ring is directed towards the outside of its respective wall; two mutually opposite forks 16-16a are instead provided at the top of the head walls 11-11a (figure 6), and the smaller and innermost one 16a is directed towards the inside of the container. The outer forks 15 and 16 constitute containment means against any outward movement of the container stacked on top of the underlying one, while the inner forks 16a, which are provided only on the head walls, constitute effective inward retention means, since during stacking said forks can accommodate within a rectangular cavity 17 which is illustrated in enlarged scale in figures 7 and 8 and is correspondingly provided within the feet 6b of the base frame 1; in this manner the upper container is stably outwardly retained by the forks 15-16 and inwardly retained by the forks 16a which are engaged within the base frame.

In order to stabilize the walls in vertical position, hooks are coupled to the larger walls 9-9a at their opposite vertical sides, for resting and retaining the head walls 11 and 11a when they are raised and moved to a vertical position at a right angle to the larger walls. Said hooks are constituted by portions of metal rod 18-18a-18b etc. which are horizontally coupled to the walls and have their curved end 18c (figures 10 and 11) folded at 90° and then again at 90° to create a curved hook 19 for the outer vertical rod of the head wall. In fact by lifting the wall 11 (and the wall 11c on the other side) according to the arrow A of figure 10, when said wall is in vertical position its outer vertical rod 11d abuts within the hook 19 (figure 11), thus preventing the wall from moving outwards.

In order to prevent said wall 11 (and 11a) from moving towards the inside of the container, a clamp device 20 is mounted on two contiguous and horizontal rods of said wall (figure 9) and is adapted to lock said walls to the walls 9 and 9a, ensuring the rigid assembly of said container. By acting on the clamp device it is possible to easily achieve both the locking and the release of the walls 9 and 9a and 11-11a to fold them onto the base of the frame. The clamp device 20 comprises a hook 21 engaging a rod 11g and a tab 22 adpted to act on the curved end 18c.

The palletizing container with grid walls collapsible onto the base frame can have, as in the case of known containers, a portion 23 of wall 9 or 9b (figure 2) which is outwardly foldable to facilitate the unloading of the container without causing the product to fall out and with less physical effort.

Naturally the invention as described above merely by way of preferred embodiment is in practice susceptible to structurally equivalent modifications and variations, and to variations in the dimensions and capacity of the container, without thereby abandoning the scope of the protection of the invention.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Collapsible palletizing container of the type with metal grid walls, particularly for transporting and storing packaged products, stackable on top of identical containers, characterized in that it comprises a base frame (1) which can be lifted by means of the forks of fork-lift trucks and has vertically protruding corner elements at its corners and a bottom (4) made of tubular elements welded to the wall tubes, a bottom grid resting on said tubular elements and being fixed to the structure by means of U-bolts (5), walls (9,11 ,9a ,11a) made of rod grids being pivoted to the sides of said frame; the larger or front walls (9,9a) being pivoted at a higher level than the head or lateral ones (11 ,11a) so that they can be collapsed until they stack in a pack onto said bottom by initially collapsing the head walls and successively collapsing the larger walls onto said head walls; along the vertical sides of the larger walls there are hook elements (19) which are directed towards the inside of the container and are adapted to constitute abutment and retention means for the sides of the head walls after they have been lifted to their vertical position to open; a clamp device (20) is provided at at least one of said abutment and retention means and is mounted on horizontal rods (11e,11f) of the head walls and locks the outer vertical rod of each head wall within the hook of said abutment means, thus ensuring the stable mutual coupling of the four walls; at the top of the larger walls there is at least one outwardly curved fork element (15) for outwardly retaining the base frame when containers are stacked; at the top of the head walls there is at least one pair of retention elements, in particular opposite forks (15), the innermost whereof accommodates within a slot correspondingly provided in the base of the frame of the superimposed container to inwardly retain said container.

2. Container according to claim 1, characterized in that a portion of vertical grid (7) is fixed between the opposite corner elements of the frame which are arranged on the side of the larger walls; the larger wall (9) is pivoted to the upper horizontal rod of said vertical grid portion and said grid portion is lower than said vertical corner elements (6) which protrude from the frame.

3. Container according to claim 1, characterized in that a plane, constituted by a metallic grid (4) stably coupled to crosspieces (3) provided inside the base frame, is arranged on said base frame.

4. Container according to claims 1 to 3, characterized in that inside said corner elements (6) rigidly associated with the base frame there is a protruding ledge (6a) constituting a stable stop element for the base of said frame when two containers with collapsed walls are stacked.

5. Container according to the preceding claims, characterized in that said metallic grid walls (9,9a, 11 ,11a) are pivoted to the base frame and to said vertical grid portion by means of U-bolts (8,8a,12,10) or the like.

6. Container according to the preceding claims, characterized in that it comprises a tube welded to the base frame and connecting the outer corner elements.

7. Container according to claim 1, characterized in that said inner retention elements are welded to the larger walls for containers having such dimensions as to require double retention.

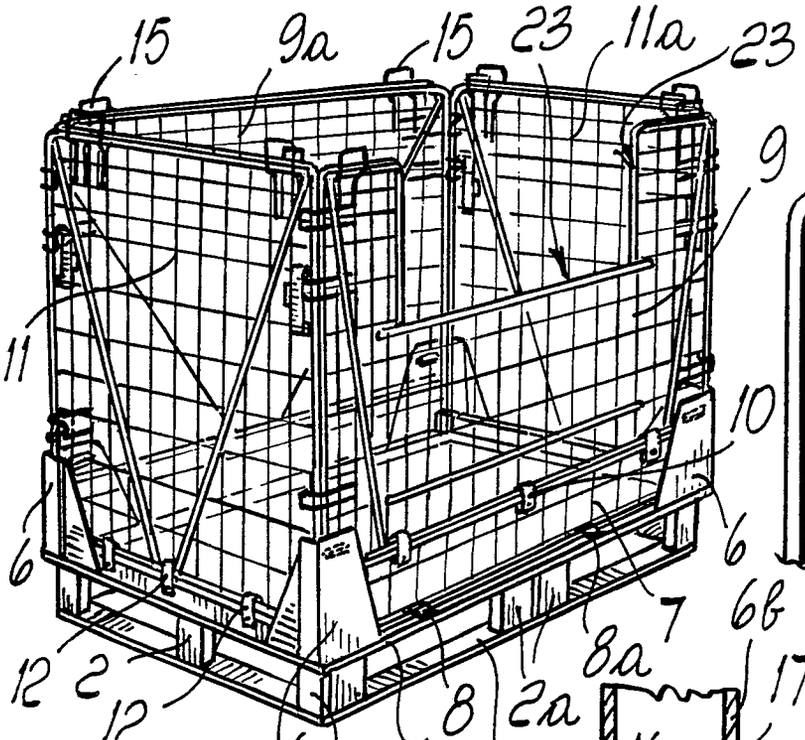

Fig.2

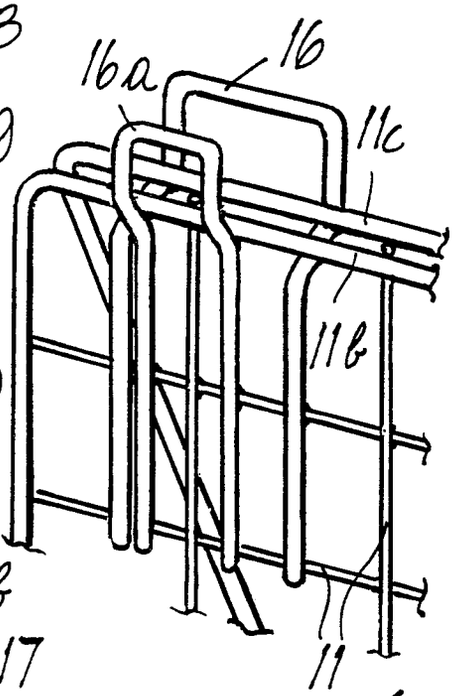

Fig.6

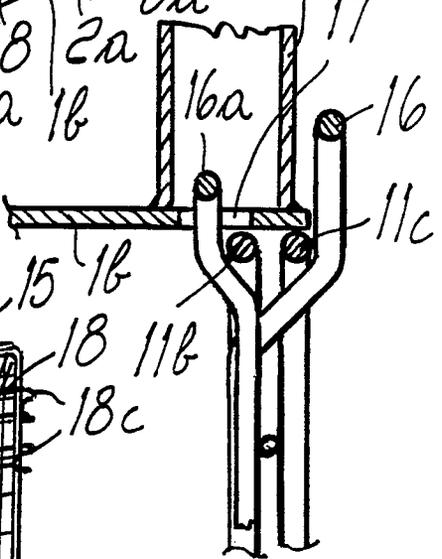

Fig.7

Fig.1

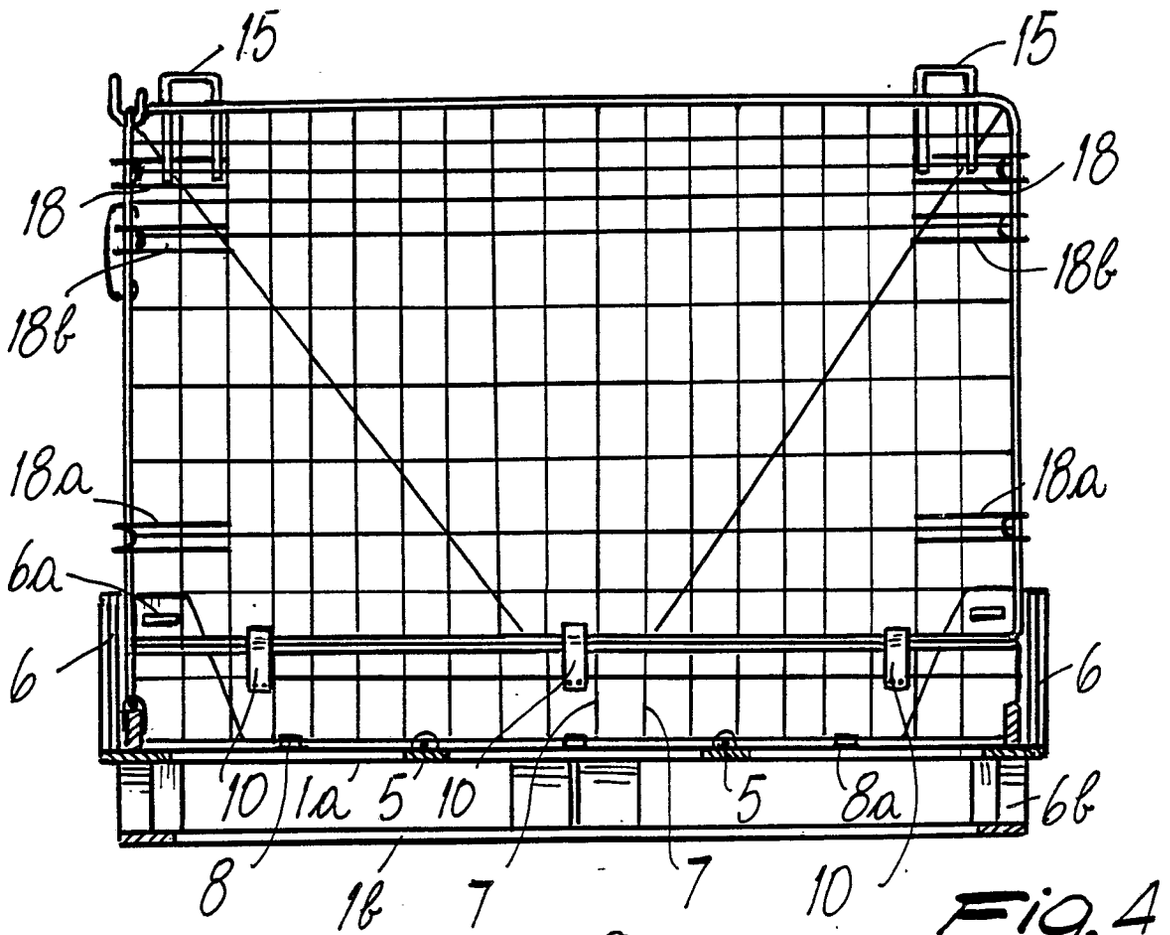
15
15
18
18
18b
18b
18a
18a
6a
6
6
10
1a
5
10
5
8a
6b
8
1b
7
7
10

Fig. 4

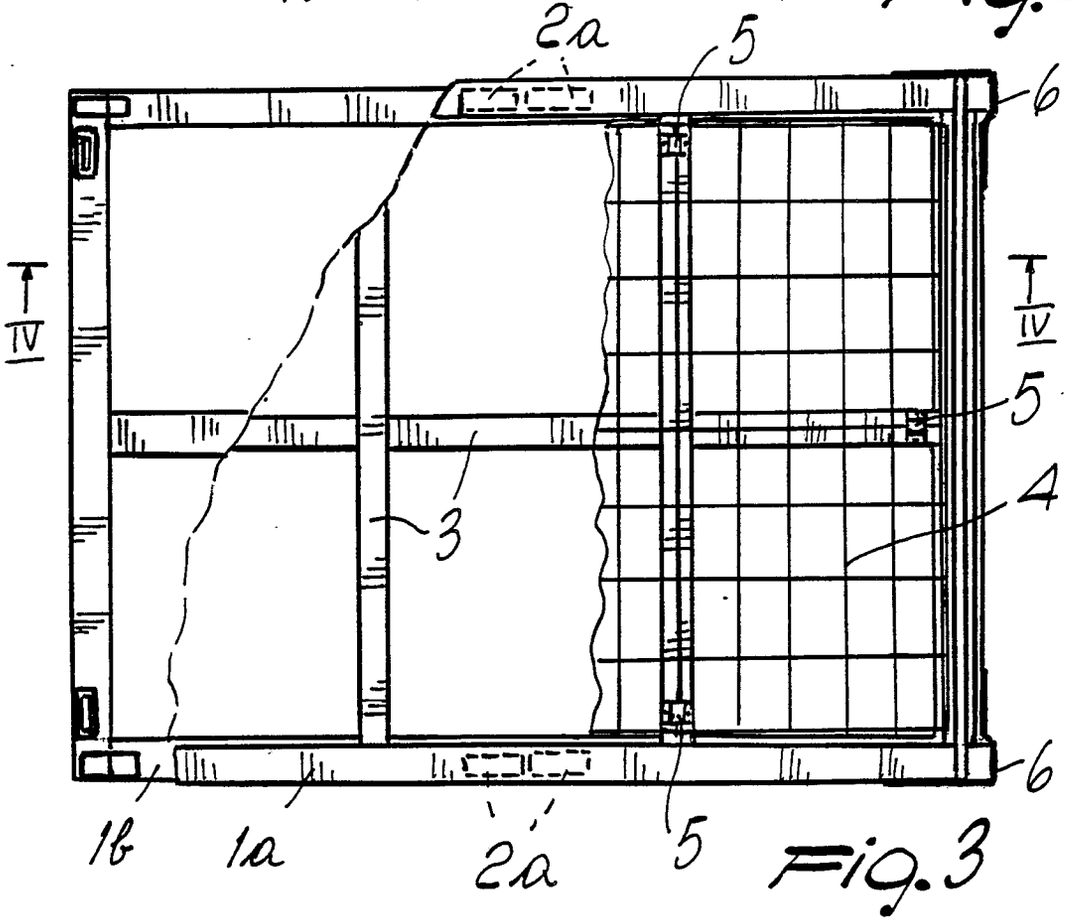
2a
5
6
IV
IV
5
3
4
6
1b
1a
2a
5

Fig. 3

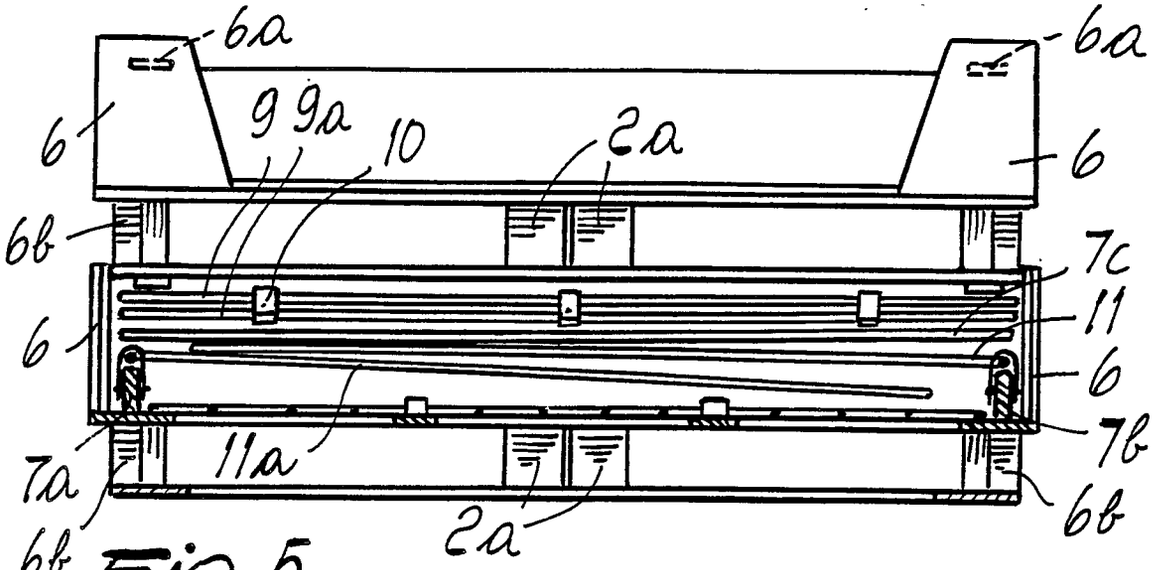

Fig. 5

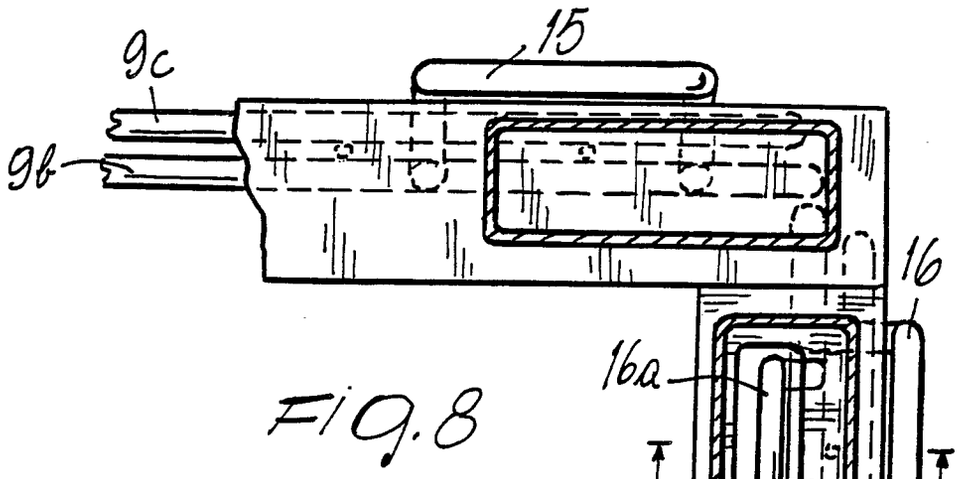

Fig. 8

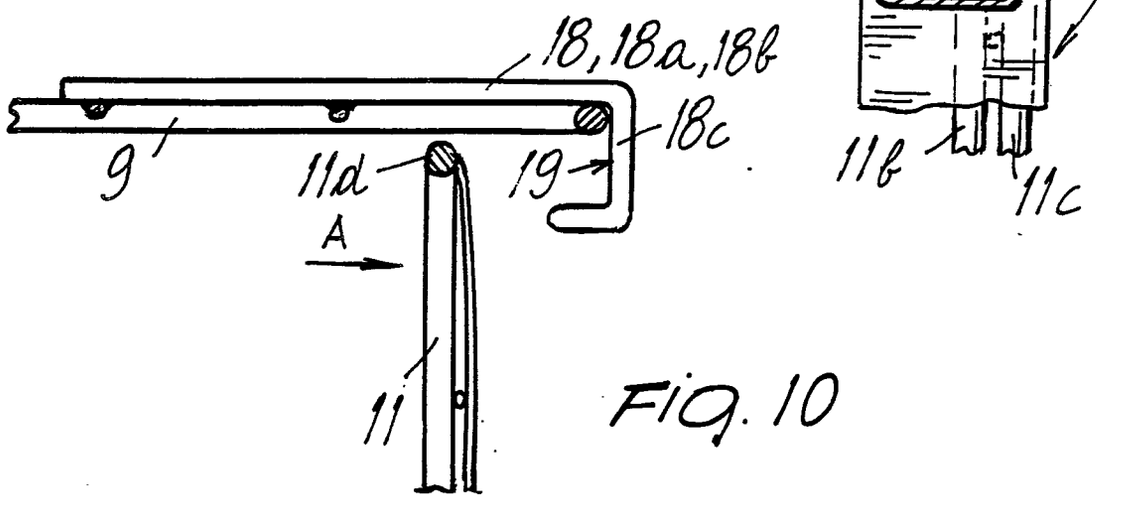

Fig. 10

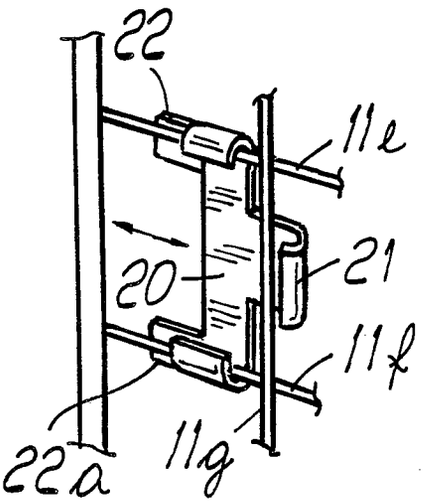

FIG. 9

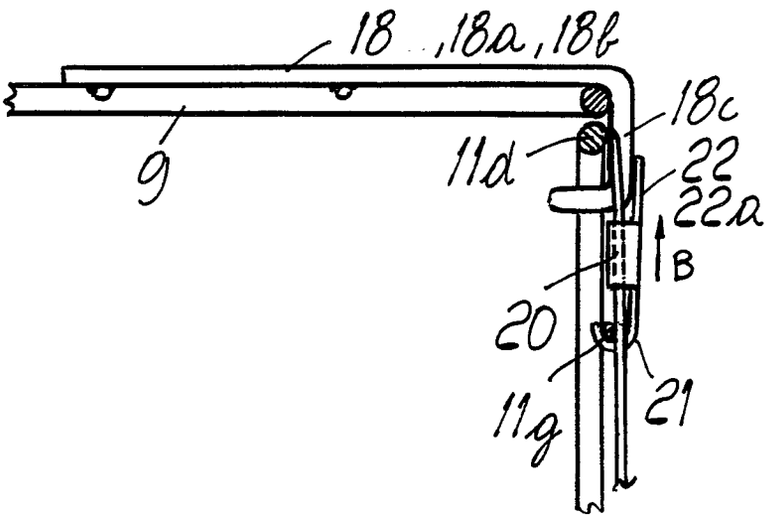

FIG. 11