Dec. 14, 1965 D. TOLNAI 3,223,274

COLLAPSIBLE CONTAINER

Filed Nov. 26, 1962

FIG. 1

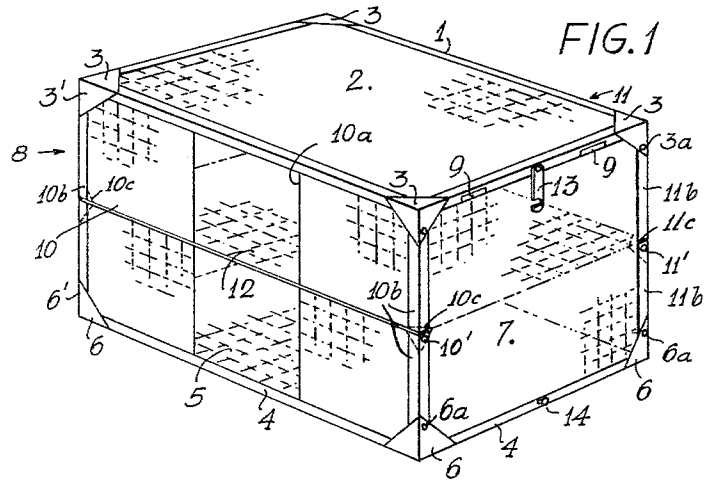


FIG. 2

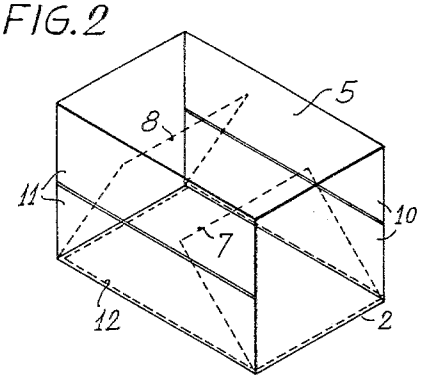


FIG. 3

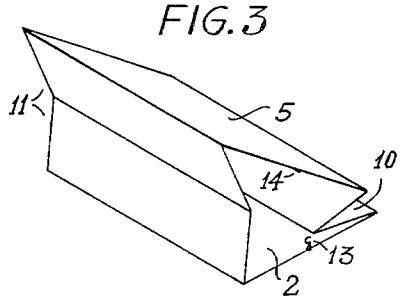


FIG. 4

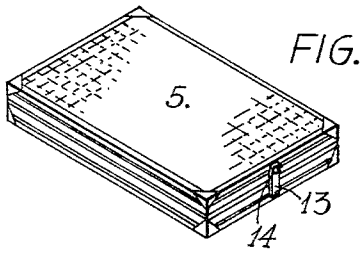
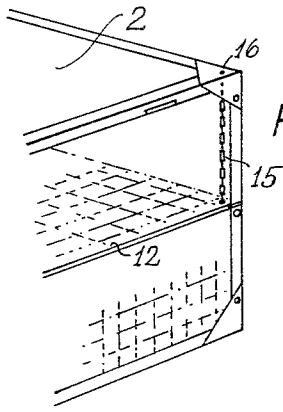


FIG. 5



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COLLAPSIBLE CONTAINER

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This invention relates to the transport of poultry and fowl, hereinafter called poultry, or other articles, and in particular to collapsible containers for such transport.

It is the object of the invention to provide a container or cage which in the erected position may be used for the transport of poultry or other articles, and which may be easily collapsed to take up a minimum space which fact reduces the return transport costs considerably.

The invention provides a container which may be collapsed and erected in a very simple and quick manner. It comprises an upper horizontal wall serving as the top wall when the container is in its erect position, and a pair of opposed vertical side walls each pivotably mounted at its upper and lower end to the upper and lower ends of the container, respectively. Each of the pair of side walls is divided into two sections. Means are provided hinging the two sections together permitting them to fold along a horizontal longitudinal line. Further, the container includes a pair of opposed vertical end walls each pivotably mounted at its upper end to the upper portion of the container and free at its lower end. The container further includes a lower horizontal wall. Means are provided for mounting the lower horizontal wall so that it is supported in position spaced below the upper horizontal wall and in engagement with the side and end walls when the container is erect, but is unsupported when the container is inverted. The last-mentioned mounting means permit the pivoting of the side and end walls so that only the lower horizontal wall, when positioned as mentioned above, locks the side and end walls against collapse. Inverting the container causes the lower horizontal wall to drop on top of the upper horizontal wall by gravity, and thereby automatically frees the side and end walls to collapse thereon also by gravity. Thus, inverting the container frees all the walls for collapse, dropping the container in the inverted position being normally sufficient to effect the collapse.

To erect the container, it is only necessary to restore it to its normal position and to pull up on the top wall until the side and end walls are locked in position by the lower horizontal wall. All this will be more fully explained below.

In the preferred embodiment of the invention as described, there is further included a bottom wall, the lower horizontal wall mentioned above constituting an intermediate wall between the top and the bottom walls.

Various mounting means may be used for supporting the intermediate wall. In one described embodiment, the intermediate wall rests on abutments, and in another described embodiment it is suspended by means of chains.

In a preferred embodiment of the invention, the corners of the bottom and top frame are reinforced by pyramid shaped cap-like reinforcements in which the hinged connections for the walls are disposed.

In the accompanying drawings one embodiment of the invention is illustrated, together with a modification thereof by way of example only.

FIG. 1 shows in a perspective view the cage according to the invention in the erected state.

FIGS. 2–4 show in schematical perspective views the cage in three different stages of its being collapsed.

FIG. 5 shows a modification of the cage in a fractional view.

Referring to the drawings, the container or cage according to the invention is shown in FIG. 1 in the erected state and comprises a top frame **1** made of angle irons to which frame the top wall **2** of wire netting or the like material is fixedly attached. The corners of frame **1** are reinforced by pyramid shaped cap-like metal reinforcements **3** which have a downwardly extending section **3'**. The bottom frame **4** of the cage is constructed in the same way as the top frame **1** and has the bottom wall **5** of wire netting fixedly attached to it, metal reinforcements **6** having an upwardly extending section **6'** being provided at the corners. To the top frame **1** a pair of walls, namely the end walls **7** and **8** are, hingedly attached at **9**. Another pair of walls, namely the front and rear side walls, **10** and **11**, respectively, of the cage, are each composed of two substantially equal sections hinged to one another at the ends of their horizontal longitudinal median lines **10'**, **11'**, both sections **10** each having an opening **10***a* to be covered by a door (not shown) for the insertion and removal of the poultry into or from the cage as known per se. The height of the side walls **10**, **11**, respectively, is substantially equal to or less than the width of the cage, i.e. the width of the top and bottom frames.

Each section of the side walls **10**, **11**, respectively, is reinforced along its vertical edges by an angle iron **10***b*, **11***b*, respectively. The side walls **10**, **11**, are hingedly attached at the ends of their bottom edges at **6***a* to upstanding extensions **6'** of reinforcements **6** of the bottom frame **4** and at the ends of their top edges **3***a* to the extensions **3'** of reinforcements **3** of the top frame **1**, the hinged connections **6***a*, **3***a* being spaced slightly from the bottom **5** and top **2**, respectively, for a purpose which will become clear hereinafter. Internal abutments in the form of narrow short ledges **10***c*, **11***c* are provided at the angle iron reinforcements **10***b*, **11***b* at the top of the lower sections **10**, **11**, respectively. A lower horizontal or intermediate wall **12** sits loosely on said abutments, constituting the mounting elements for the wall, and thus divides the cage into an upper and a lower chamber. Hooks **13** and cooperating studs **14** are attached on two opposite sides of frame **1**, the hook **13** turning about a pivot and thus being adapted to engage, or be disengaged from, the stud **14**.

A modification of the manner in which the intermediate wall **12** is supported, is shown in FIG. 5. Here the said wall **12** is suspended from the mounting elements consisting of four chains **15** (one of which is seen in the fractional view of FIG. 5). Each chain is fixed at **16** to the top wall **2** at the corners thereof.

In order to collapse the cage, it is turned upside-down (FIG. 2) which causes the intermediate wall **12** to drop onto top wall **2**. Thereafter end walls **7** and **8** are folded inwardly. Now walls **10** and **11** (FIG. 3) are folded around hinges **10'**, **11'**, respectively and, simultaneously, around hinged connections **6***a*, **3***a* so that the bottom frame **4** is lowered onto top frame **1**. Owing to the connections **6***a*, **3***a* being spaced slightly from the bottom and top frames, respectively, space is provided for the intermediate floor and the end walls to lie flat and to permit the sections of the side walls likewise to lie substantially flat. After the entire cage has been collapsed as described, the hooks **13**, if included, are turned (FIG. 4) to engage the stud **14** and thus constitute secure means to hold the collapsed cage together.

It is thus seen that the means for mounting intermediate wall **12**, whether they be the abutments **10***c* and **11***c* of FIG. 1 or the chains **15** of FIG. 5, do not interfere with the pivoting of the side and end walls, and that only the intermediate wall **12** locks these walls against pivoting, and collapse. This lock against collapse is automatically removed by merely inverting the container,

which causes the intermediate wall to drop on top of the top wall **5** by gravity. The side and end walls are thus free to collapse, and usually their collapse is automatically started when the container is inverted and the intermediate wall is dropped on top of the top wall. That is to say that when this occurs, there is usually enough sideways shaking or movement of the container and the pivot points of the side and end walls to start their collapse, and once it starts, it continues by gravity automatically. In those relatively rare instances where merely dropping the container is insufficient to start the collapse, a gentle sideways kick of the container would normally be sufficient.

Thus, the container normally automatically collapses by its own weight upon merely dropping it in the inverted position.

The collapsed container may also be erected in a very simple manner. All that is necessary is to turn over the collapsed inverted container to its original position and to pull up on the top wall **5**. This causes the side end and end walls **10, 11** and **7, 8**, respectively, to pivot open, and also the intermediate wall **12** to move into position where it locks the side and end walls when they assume their fully erect positons.

I claim:

1. An easily collapsible and erectable container having an upper and a lower end, comprising: an upper horizontal wall serving as the top wall of the container when the container is in its erect position; a pair of opposed vertical side walls each having an upper and a lower end; each of said side walls being pivotably mounted at its upper and lower ends to the upper and lower ends of the container, respectively; each of said pair of side walls being divided into two sections; means hinging the two sections together permitting them to fold along a horizontal longitudinal line; a pair of opposed vertical end walls each having an upper and a lower end; each of said end walls being pivotally mounted at its upper end to the upper end of the container and free at its lower end; a lower horizontal wall; and means for mounting said lower horizontal wall; said latter means consisting of mounting elements which mount the lower horizontal wall so that it is supported in position spaced below the upper horizontal wall and in engagement with the side and end walls when the container is erect but is unsupported when the container is inverted, and which permit the pivoting of the side and end walls so that only said lower horizontal wall when so positioned locks said side and end walls against collapse, whereby merely inverting the container causes the lower horizontal wall to drop on top of the upper horizontal wall by gravity, and thereby frees the side and end walls to collapse thereon also by gravity, the container being erectable by merely re-inverting it and pulling up on the top wall until the lower horizontal wall locks the side and end walls in position.

2. A container as defined in claim **1**, further including a bottom wall, said lower horizontal wall constituting an intermediate wall between said top and bottom walls.

3. A container as defined in claim **1**, wherein said lower horizontal wall mounting means consists of abutments upon which said lower horizontal wall rests while the container is erect.

4. A container as defined in claim **1**, wherein said lower horizontal wall mounting means consists of chains suspending said lower horizontal wall while the container is erect.

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