

April 2, 1968

J. S. KIVETT ET AL
MATERIAL HANDLING SYSTEM

3,376,046

Filed March 29, 1965

2 Sheets-Sheet 1

Fig. 1.

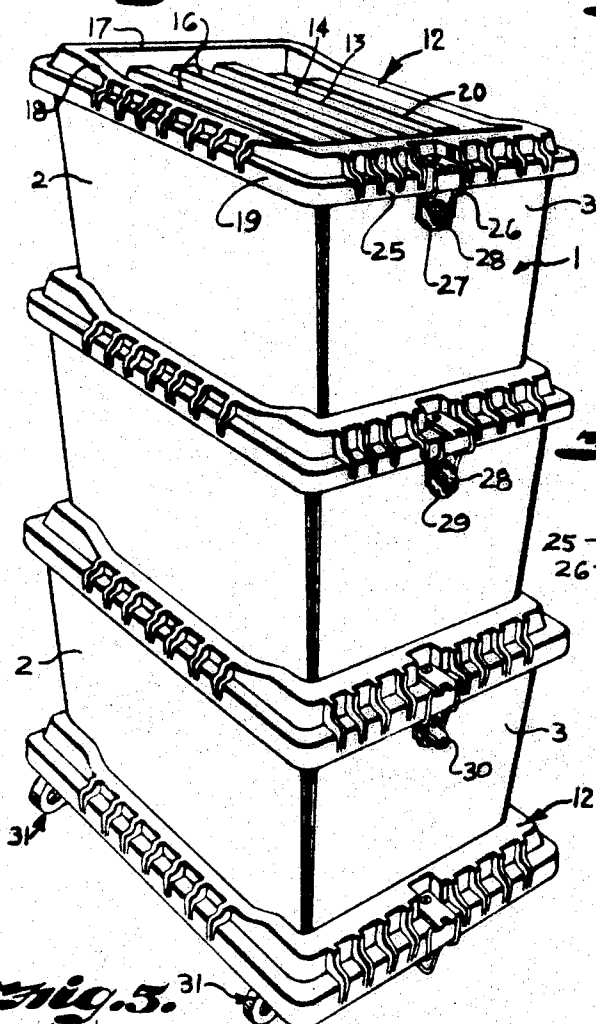


Fig. 2.

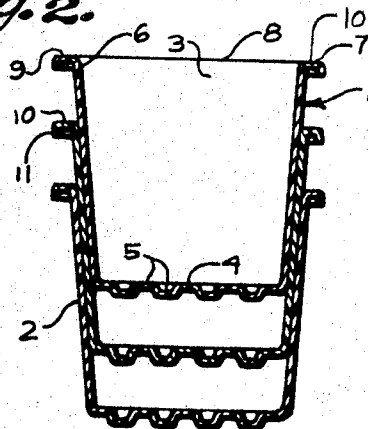


Fig. 3.

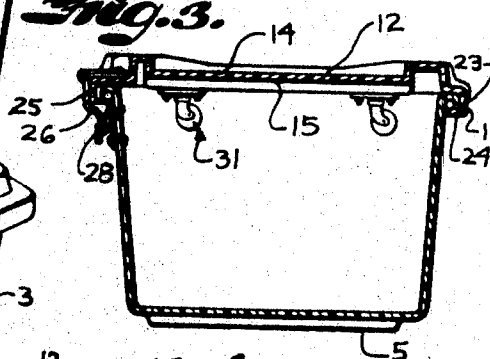


Fig. 4.

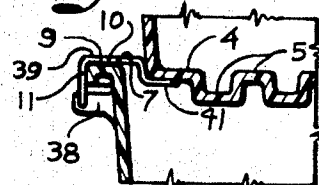


Fig. 5.

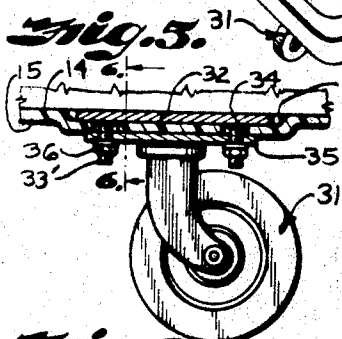


Fig. 6.

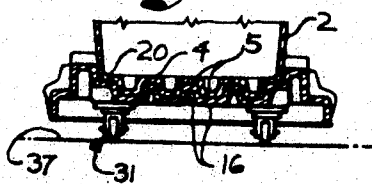


Fig. 7.

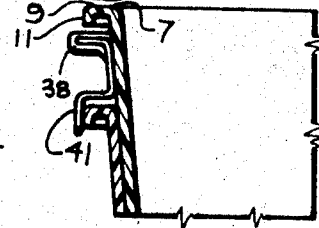


Fig. 8.

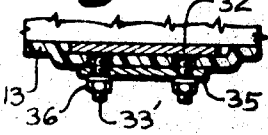
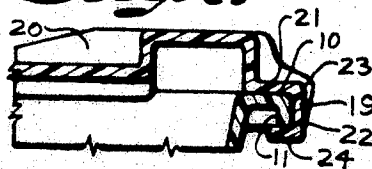


Fig. 9.



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Fig. 11.

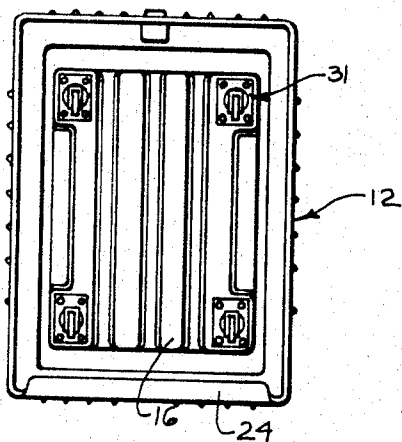


Fig. 12.

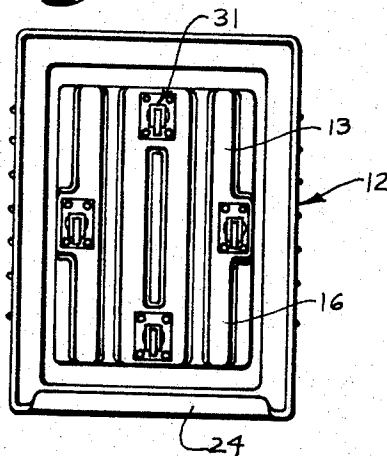


Fig. 13.

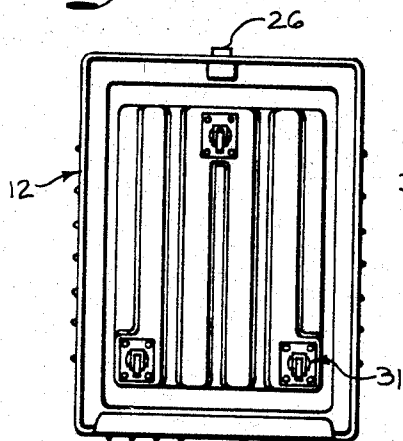


Fig. 10.

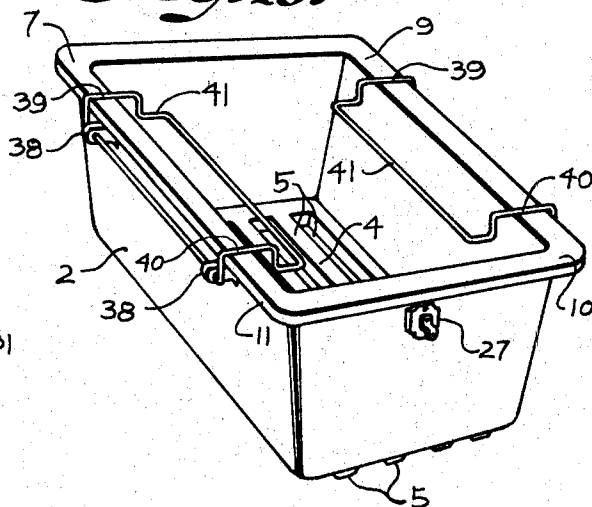
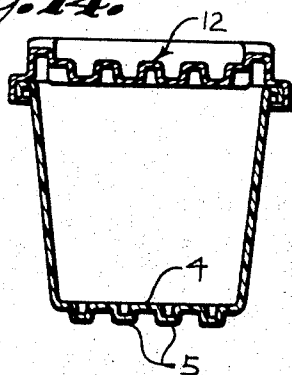


Fig. 14.



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MATERIAL HANDLING SYSTEM

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ABSTRACT OF THE DISCLOSURE

Multiple containers have tapered side and end walls so that they are nestable within each other for storage. Lids for the containers have depressed top portions forming pockets for receiving the bottom of a container to permit stacking without lateral sliding. Selected lids have wheels secured to the under surface thereof, whereby a lid may be used on the bottom of a stack as a truck, and yet the wheels may be hidden within the container when the lid is used for its normal function. The lids have lip portions cooperating with corresponding lip portions on the containers for maintaining the lid engaged with the container at one end and a hasp and latch member are respectively secured to the lid and container at a position opposite from the engaging lips to secure the lid in place.

This invention relates to improvements in material handling systems and more particularly to a container and lid assembly for use in warehouses and the like.

The principal objects of the present invention are: to provide a container and lid assembly wherein the lid may be selectively used as a caster truck and as a covering lid; to provide such an assembly wherein the lid is adapted to receive an upper container thereinto for modular stacking without relative lateral displacement; to provide such an assembly wherein the lid may be locked into position on the container to help insure against upsetting stacked containers due to separation between the lid and the container which it covers; to provide such an assembly wherein the containers may be telescoped or nested into each other for convenient storage and handling; to provide such a material handling system wherein the containers include support members pivotally secured to the side walls thereof and adapted to selectively assume a position extending toward the opposite side wall to support the bottom of an upper container in absence of a lid; to provide such an assembly wherein the lid surface for receiving the bottom of the container and the container bottom are integrally ribbed for strength and yet fit into each other without wasting space; to provide such a lid having caster wheels supported in spaced apart positions thereon in a manner which minimizes local bending in the lid and thereby increases the life thereof; and to provide such a container assembly which is easily manufactured and rugged and convenient in use.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings wherein are set forth by way of illustration and example certain embodiments of this invention.

FIG. 1 is a perspective view showing several containers in stacked condition with lids therebetween, the stack being supported by an additional caster lid for ease of movement.

FIG. 2 is a vertical cross-sectional view through three containers in nested positions.

FIG. 3 is a vertical cross-sectional view through a container and lid assembly showing the position assumed by the caster wheels when a caster lid is used as a cover.

FIG. 4 is a fragmentary cross-sectional view through a caster lid and container showing the container bottom

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received in and resting on the lid which, in turn, rests upon the ground.

FIG. 5 is a fragmentary cross-sectional view through a caster lid on an enlarged scale particularly illustrating the fastening structure between the caster wheel and the lid body.

FIG. 6 is a fragmentary cross-sectional view taken on the line 6—6, FIG. 5, further showing the fastening structure between the wheel and lid.

FIG. 7 is a fragmentary cross-sectional view through an assembled container and lid particularly showing a lid portion projecting inwardly from a depending lid lip for engaging the upper lip on an end wall of the container to prevent a vertical separation therebetween unless the lid is moved horizontally with respect to the container.

FIG. 8 is a fragmentary cross-sectional view on an enlarged scale showing a container support pivotally mounted on the side wall of a lower container for receiving and supporting the bottom of an upper container in absence of a lid.

FIG. 9 is a vertical cross-sectional view through a pair of nested containers on an enlarged scale showing the container support pivoted out of the container interior and against the side wall.

FIG. 10 is perspective view of a container with the pivotal container supports projecting inwardly.

FIGS. 11, 12 and 13 are bottom views of caster lids showing alternate positions for securing caster wheels thereto.

FIG. 14 is a vertical, longitudinal cross-sectional view through a container and lid particularly showing engaging cooperation between the lid lip and container lip.

Referring to the drawings in more detail:

The reference numeral 1 generally indicates a one-piece container or receptacle preferably molded of synthetic resin and comprising downwardly and inwardly converging side walls 2 and end walls 3 joined together and adapted to telescope within each other for nesting as best illustrated in FIG. 2. The containers 1 each include a bottom wall 4 having spaced apart longitudinally extending ribs 5 formed integrally therewith and an upwardly open top 6 defined by top edges 7 and 8, respectively, of the side and end walls 2 and 3. The top edges 7 and 8 form a continuous four-cornered lip 9 integral with and extending outwardly from the container forming a substantially flat horizontal upper portion 10 and a downwardly extending end flange 11.

A lid designated 12 is provided for the container 1 and has a central generally horizontally extending body portion 13 with an upper surface 14 and a lower surface 15. The lid 12 is also preferably constructed of molded synthetic resin in such manner that spaced apart integral parallel ribs 16 are alternately formed in the upper and lower surfaces 14 and 15 and are spaced apart for receiving the downward projecting portions of the container ribs, FIG. 4. In addition to the ribs 16, the lid 12 has upwardly extending or elevated corner joined end and side ribs 17 and 18, respectively, which rise above the upper surface 14 adjacent and spaced slightly inwardly from a downwardly extending peripheral lip 19. The end and side ribs 17 and 18 form a cavity 20 for receiving the container bottom wall 4 and lower portions of the side and end walls 2 and 3 of an upper container. The cavity 20 is of a size for snugly receiving the bottom of the container without interfering with the cooperative engagement between the respective ribs 5 and 16 whereby when a container is resting upon the top surface of a lid, lateral relative displacement is prevented and separation can occur only by vertical separation.

The peripheral lip 19 on the lid includes a horizontal portion 21 and vertical portion 22 which respectively engage the horizontal portion 10 and the downwardly ex-

tending flange 11 of the container when the lid is in top covering position. One end 23 (FIG. 7) of the lid 12 has a horizontal lip portion 24 projecting inwardly from the bottom edge of the vertical portion 22. The lip portion 24 is adapted for engagement with the bottom of the downwardly extending end flange 11 of the container to prevent vertical separation therebetween unless the lid is first tilted upwardly from the container end 25 (FIG. 3) opposite the end 23 and then displaced horizontally toward the end 23 to effect disengagement between the lip portion 24 and the end flange 11.

The end 25 has a hasp member 26 pivotally fastened thereto and a correspondingly positioned latch member 27 is fixed to the adjacent end wall 3 of the container. The hasp member curved inwardly beneath the end 25 for engagement with the latch member whereby they lock together beneath the lid lip for preventing the removal of the lid since disengagement cannot then be effected at the opposite end 23. The latch member 27, in the illustrated example, comprises a planar tab 28 generally parallel to the end of wall 3 and pivotally secured to a base plate 29 for rotation in a plan generally parallel to the end wall 3. When the tab 28 is rotated downwardly while the hasp member 26 is in contact with the base plate 29, the hasp member becomes locked in position. An end opening 30 is provided in the tab 28 for receiving a padlock, wire seal, or the like (not shown) to prevent tampering. Rotation of the tab 28 upwardly permits the hasp member 26 to be pivoted outwardly and upwardly from the receptacle allowing release of the lid.

A plurality of caster wheels 31 are secured in spaced apart relation against the lid lower surface 15 by means of a mounting plate 32 resting in suitable depressions or cavities 33 in the lid upper surface 14. The mounting plate 32 has a plurality of depending threaded studs 33' secured thereto and depending through bores 34 extending through the body portion 13 of the lid. The studs 33' also extend through the respective caster wheel plate 35 and receive suitable nuts 36 whereby the plate 35 is urged securely against the lid lower surface 15. By spacing the studs 33' a considerable distance apart, the stress transferred to the lid from the caster wheels is spread over a relatively large area and is thereby reduced in magnitude, greatly increasing the fatigue life of the lid body portion 13, particularly in the area adjacent the caster wheels.

It is apparent from the above that the respective lids 12, when the caster wheels 31 are secured thereto, may be used selectively as a lid for covering a container 1 or as a truck for receiving a container and allowing wheeled movement thereof over a floor surface 37. The cavity 20 in the lid for receiving the bottom of a container also serves to permit modular stacking of several containers (FIG. 1). When the respective lids are locked into position on the several containers, the lack of easy separation between the lids and containers helps insure against upsetting the stack during movement on the casters of the lowermost lid which supports the entire stack. When empty containers are nested as in FIG. 2, a stack thereof may also be moved on a lid in the same manner.

It is sometimes more convenient to dispense with one or more of the intermediate lids in a stack and yet be able to transport a plurality of containers simultaneously. To accomplish this outwardly projecting pairs of aligned spaced apart hinges 38 are provided on each side of the container as illustrated in FIGS. 8, 9 and 10. The hinges 38 may be formed integrally with the molded container or suitably secured thereto, for example, in the same manner as the caster wheels 31. A rod support 39 is pivotally mounted on the respective pairs of hinges 38 for selective pivotal movement from a position resting on the top edge 7 of the container (FIG. 8) to a position entirely beneath the top edge 7 (FIG. 9). The rod supports 39 are suitably bent so that an intermediate portion 40 can assume the alternate positions of resting on the top edges 7 when

folded up and against the side wall 2 when folded down. The rod supports, when in the top resting position, project toward the opposite side wall top edge and terminate in a downwardly offset portion 41 for receiving the bottom wall edge of an upper container, thereby preventing lateral displacement of the upper container with respect to the lower or supporting container and maintaining the upper container in a stacked condition in absence of a lid 12. A connecting rod portion 42 of each rod support 39 extends between the spaced apart hinges 38 and may conveniently be used as a handle for lifting the container regardless of the position taken by the rod support 39. The rod supports, when folded down, do not interfere with the nesting of the containers.

FIGS. 11, 12 and 13 illustrate various positions in which the caster wheels may be placed on the body portion 13 of the lid 12. The desired position of the caster wheels 31 will, of course, cause variations in the particular configuration of the lid ribs 16 adjacent the caster wheels; however, this need not cause alteration of the ribs 5 of the container since the mounting plates 32 are recessed at or below the lowermost level of the lid body portion 13 and thus do not interfere with the interlocking of the ribs 5 and ribs 16, FIG. 4.

It is to be understood that although certain forms of this invention have been illustrated and described, it is not to be limited to the specific form or arrangement of parts herein described and shown except insofar as such limitations are included in the following claims.

What we claim and desire to secure by Letters Patent is:

1. A container and lid assembly adapted to support and be stacked upon similar assemblies to produce a stack of containers comprising:
 - (a) an open receptacle having a side wall and a bottom wall and an upwardly open top defined by a peripheral lip,
 - (b) a lid for said receptacle having an upper and a lower horizontal surface and a peripheral lip for cooperative engagement with said receptacle lip,
 - (c) elevated ribs on said lid rising above said upper surface adjacent said lid lip and forming a cavity for receiving said bottom wall and a lower portion of said side wall of an upper receptacle thereto and preventing lateral displacement therebetween, and
 - (d) a plurality of caster wheels secured to said lid within an area defined by said receptacle lip and depending from said lower surface for selectively movably supporting said lid above the ground and covering a receptacle.
2. The lid as set forth in claim 1 wherein said caster wheels each include
 - (a) a wheel plate, a mounting plate for each of said wheels and resting on said lid upper surface and having depending threaded studs thereon,
 - (b) a cavity in said bottom portion for receiving each of said mounting plates, vertical bores through said lid in said respective cavity for receiving said studs, said studs depending through said caster wheel plate, and
 - (c) nuts threadably engaged with said studs and urging said respective wheel plate toward said mounting plate with said lid therebetween for mounting said caster wheel.
3. The assembly as set forth in claim 1 wherein said receptacle bottom wall and said lid each have alternate ribs formed therein and adapted to engage into each other when said bottom wall is received into said cavity.
4. A container and lid assembly adapted to support and be stacked upon similar assemblies to produce a stack of containers comprising:
 - (a) a quadrilateral open receptacle having side and end walls and a bottom wall and an upwardly open top defined by top edges of said side and end walls,
 - (b) said top edges forming a continuous four-cornered

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lip integral with and extending around said top, said lip extending outwardly from the top edges of said side and end walls and having a substantially flat horizontal portion and a downwardly extending end flange,

(c) a quadrilateral lid for said receptacle having an upper and a lower horizontal surface and a downwardly extending peripheral lip for cooperative engagement with said receptacle lip, a bottom portion of said lid lip at one end of said lid having a horizontal portion projecting inwardly for engagement with said receptacle lip at one end of said end walls, the opposite end of said lid having a hasp member pivotally fastened thereto, for swinging movement in a vertical plane, said hasp member curving inwardly and downwardly beneath said lid lip to a position adjacent said last-named end wall and terminating in a loop, and

(d) a latch member fixed to said last-named end wall entirely beneath said receptacle lip and including a

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planar tab rotatable in a plane generally parallel with said last-named end wall and engageable with said latch member loop beneath said lip.

References Cited

UNITED STATES PATENTS

1,141,542	6/1915	Hart	292—285
2,609,120	9/1952	Williams	220—97
2,676,729	4/1954	Neville et al.	280—79.2 X
2,766,993	10/1956	Reichelt	280—33.99 X
3,067,905	12/1962	Ehret	220—31 X
3,241,850	3/1966	Propst	280—33.99

FOREIGN PATENTS

575,973	4/1958	Italy.
320,168	4/1957	Switzerland.

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