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(54) **STACKABLE PALLET SYSTEM**

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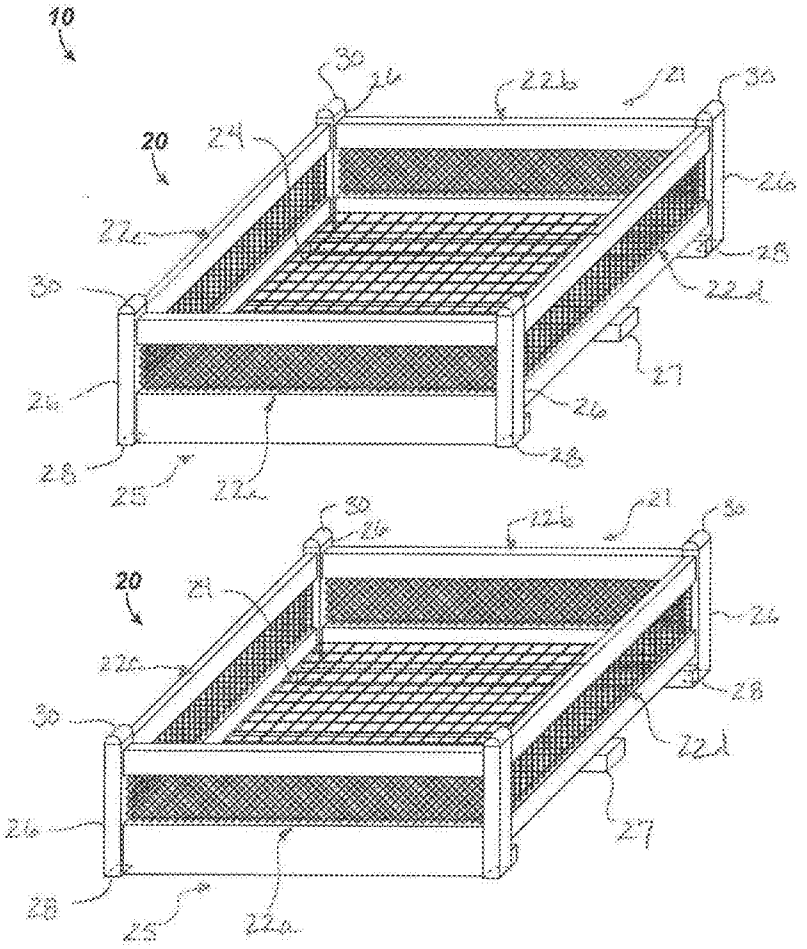
USPC **206/503**

(57) **ABSTRACT**

A stackable pallet system for holding items has a stand and stackable pallets. The stand has a top end, a bottom end, and sides. Vertical corner pieces on the stand are connected to one another at intersections of the sides of the stand, and each corner piece has a toe disposed at the top end of the stand. The stackable pallets can stack one on top of the other and can stack on the stand. The stackable pallets each have a top end, a bottom end, and sides and each have corner pieces connected to one another at intersections of the sides. Similar to the stand, each corner piece of the pallets has a toe disposed at the top end and defining a receptacle at the bottom end. When stacking pallets, the receptacle of each corner piece on a top one of the stackable pallets can receive or fit on the toe of a corresponding one of the corner pieces on a bottom one of the stackable pallets. To stack on the stand, the receptacle of each corner piece on the bottom one of the stackable pallets can receive or fit the toe of a corresponding one of the corner pieces on the stand. To help move the stacked pallets, the stand can have casters or wheels.



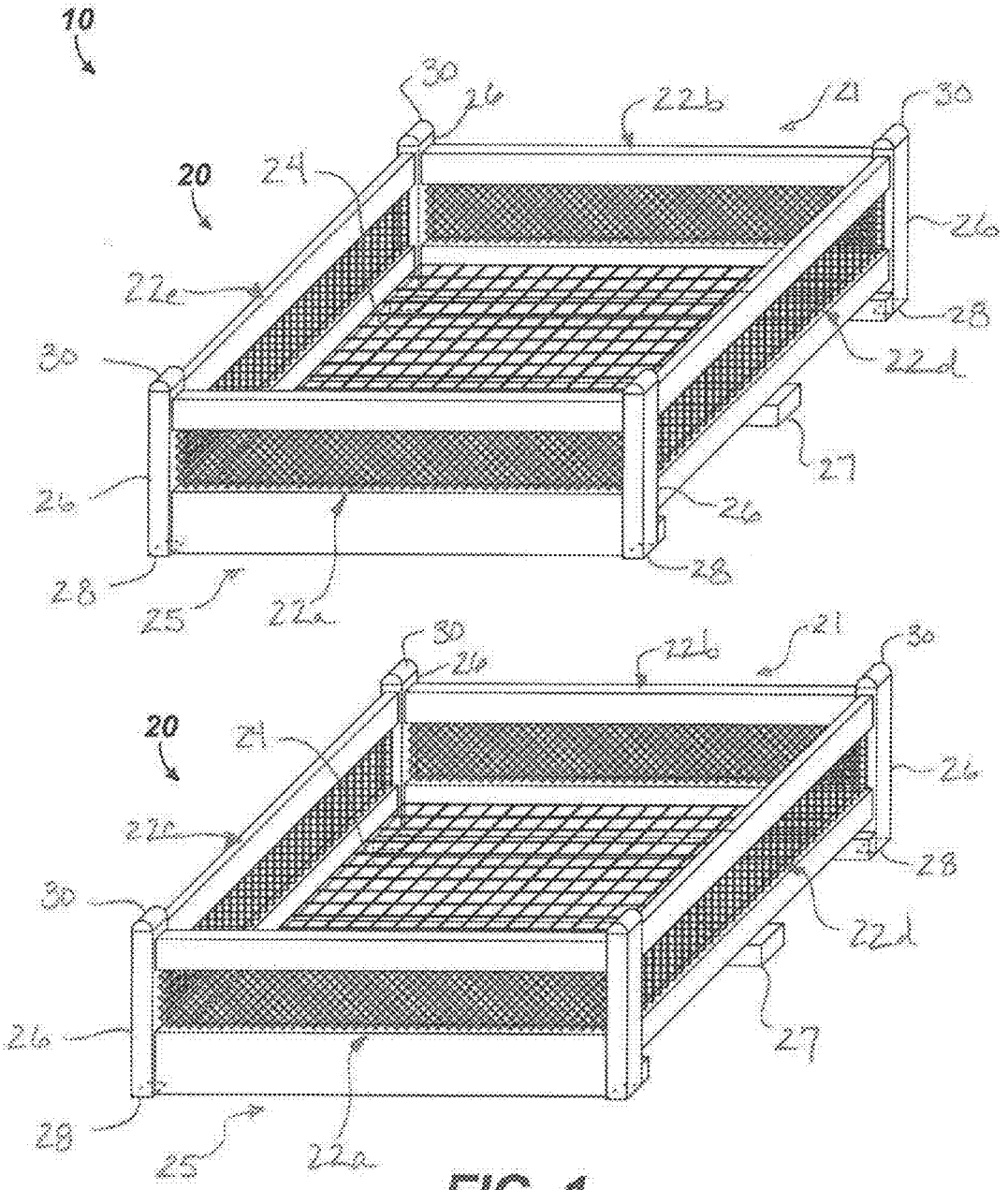
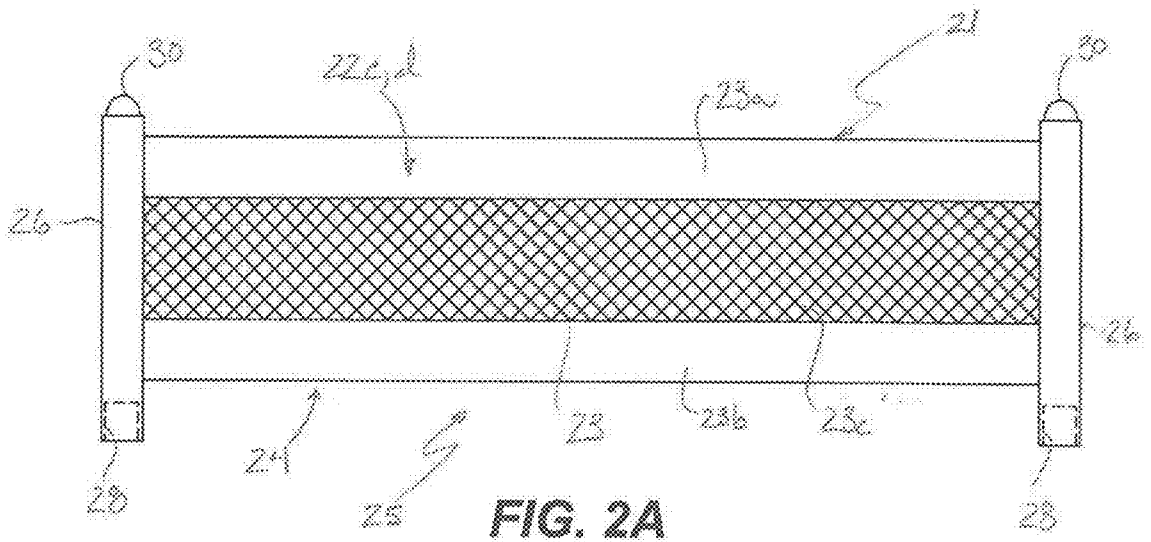


FIG. 1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22a,b
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FIG. 2A

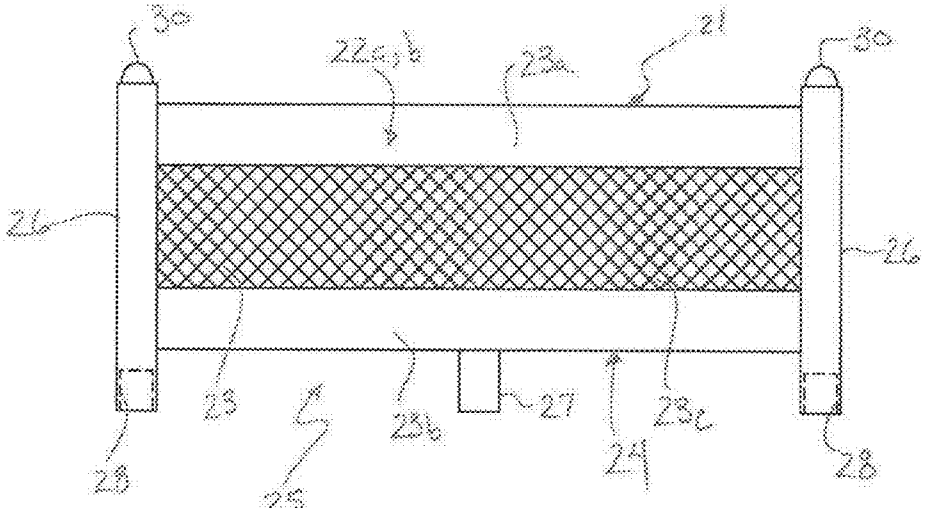
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FIG. 2B

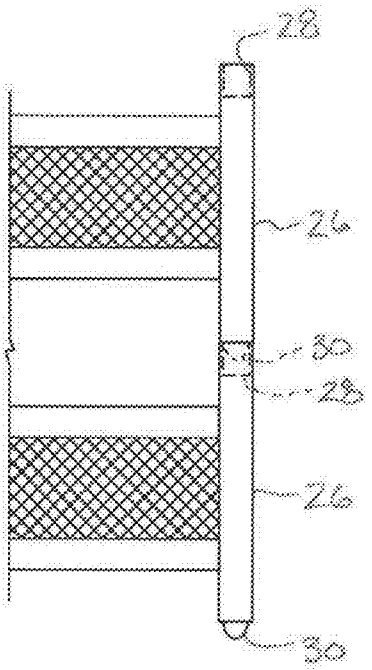


FIG. 2C

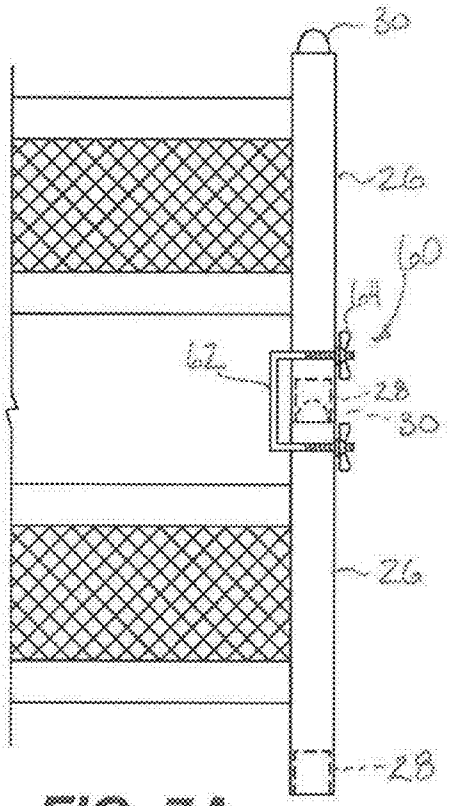


FIG. 7A

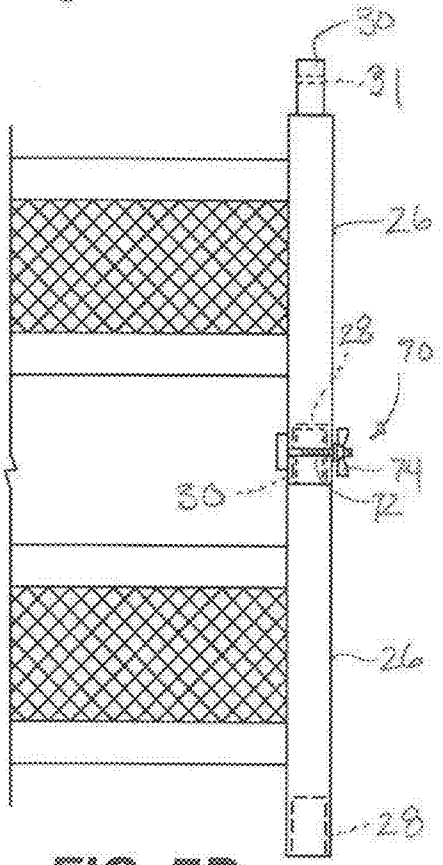


FIG. 7B

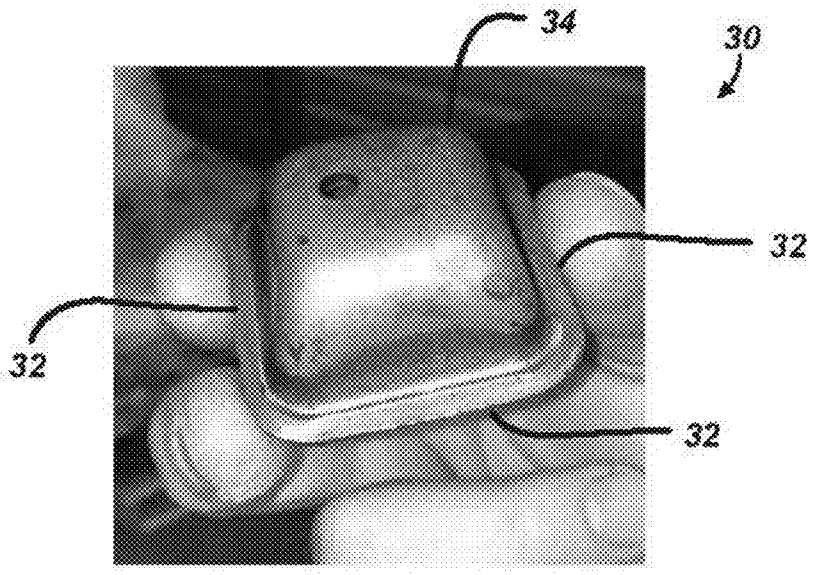


FIG. 3A

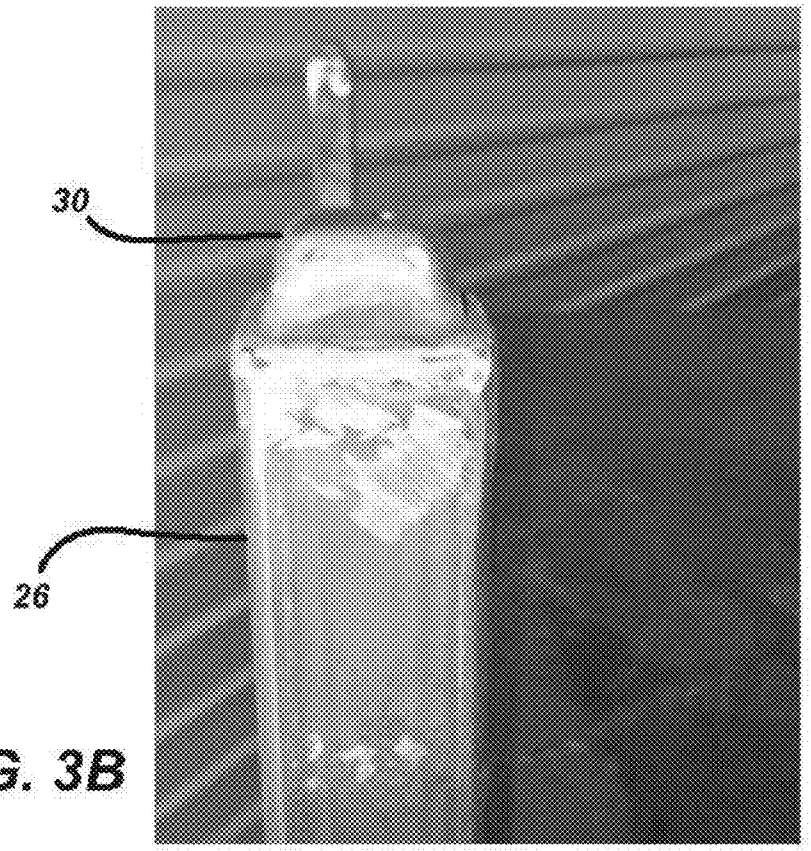


FIG. 3B

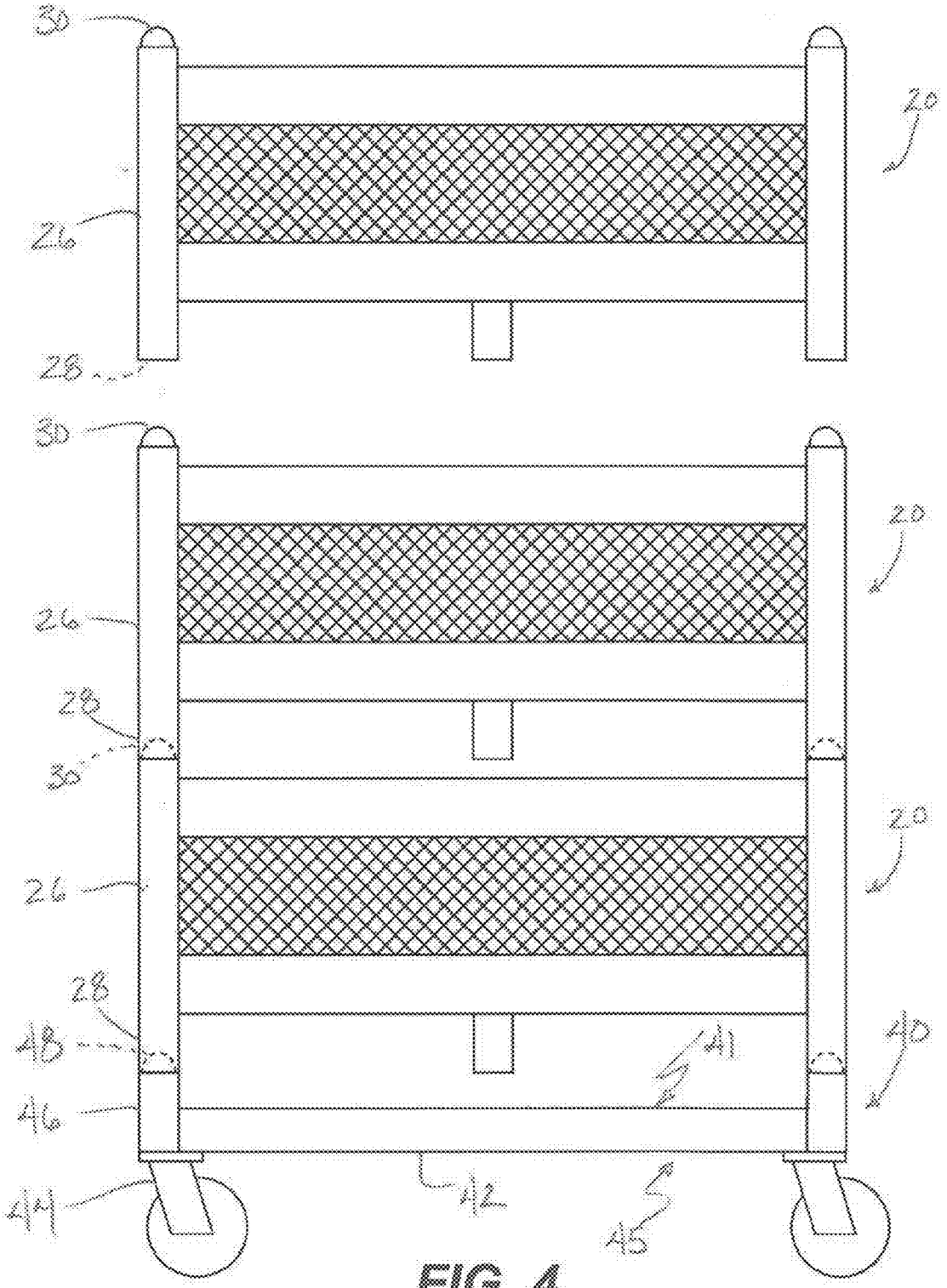
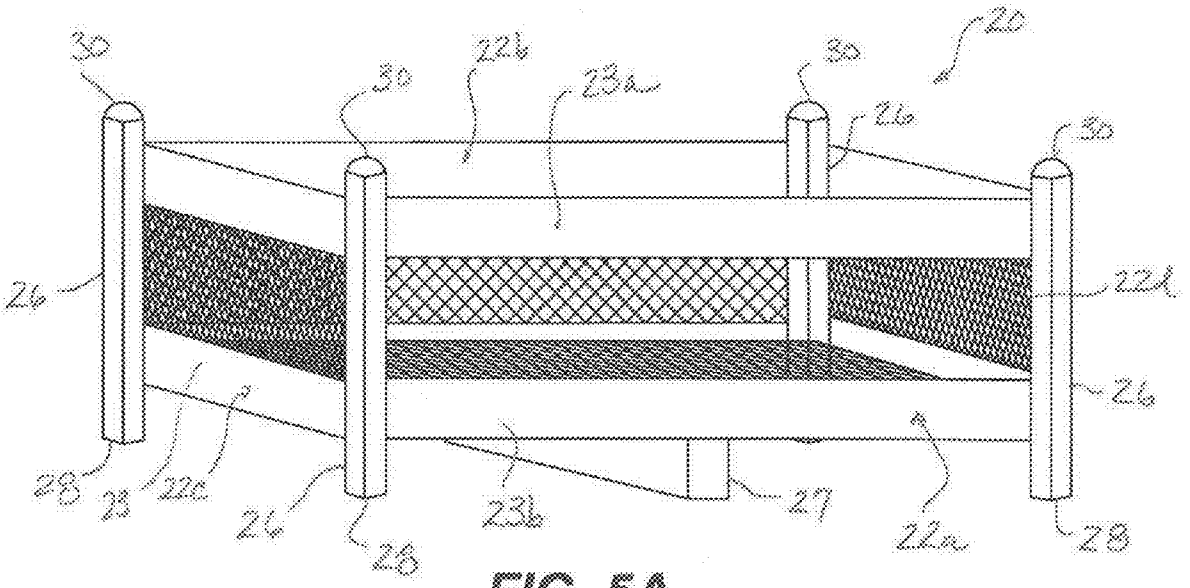


FIG. 4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22d
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22c
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FIG. 5A

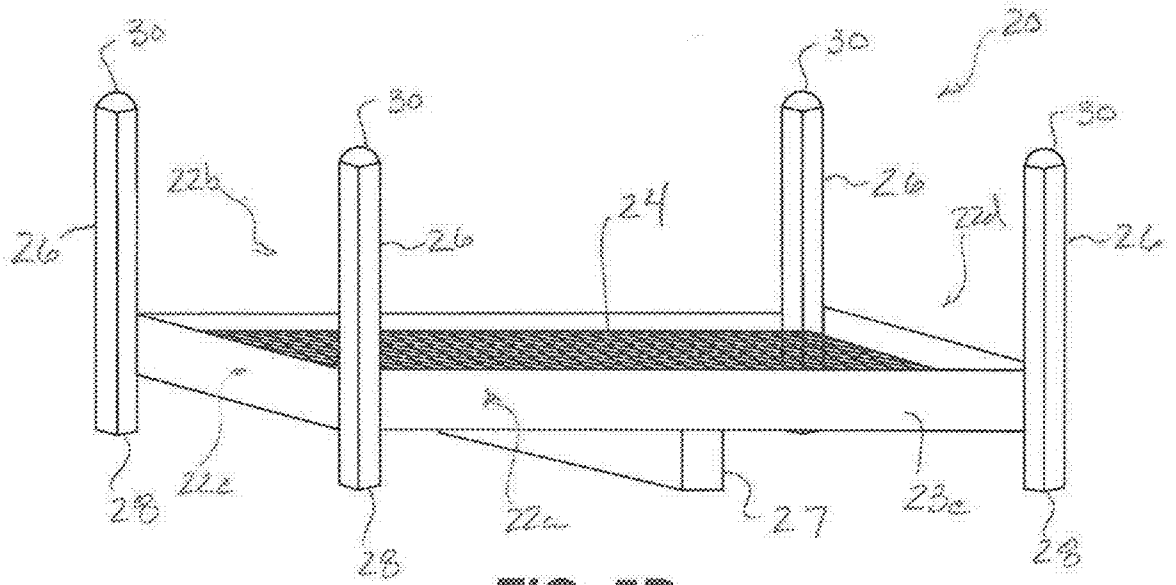
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FIG. 5B

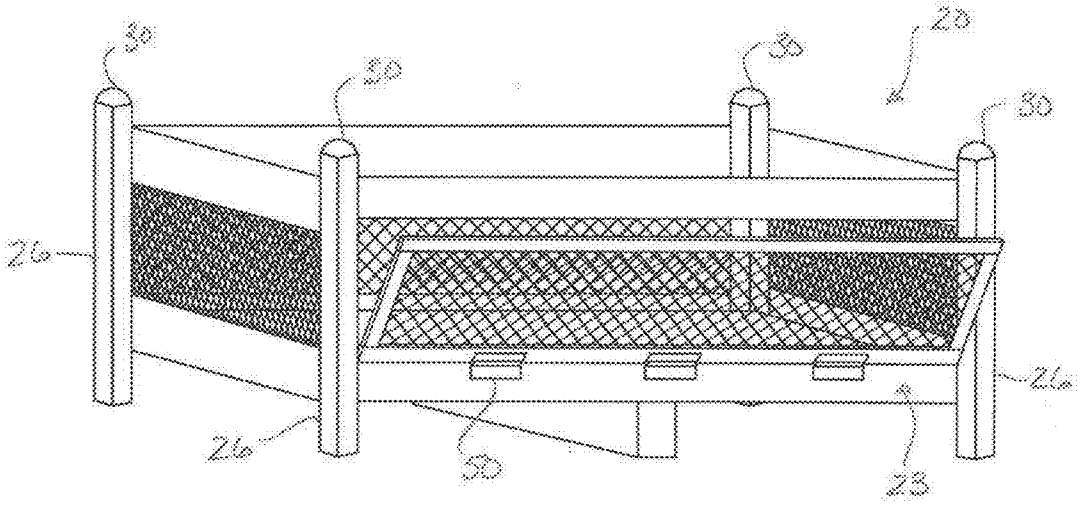
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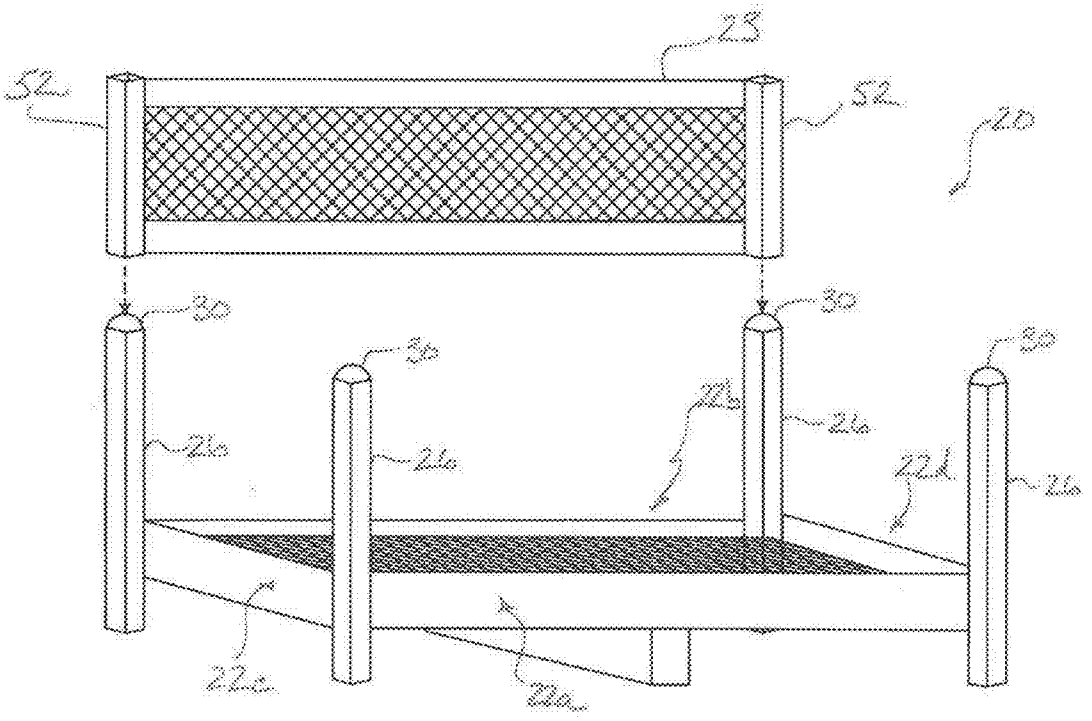
FIG. 5C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22b
22b
22d
26
22c
22a

FIG. 5D

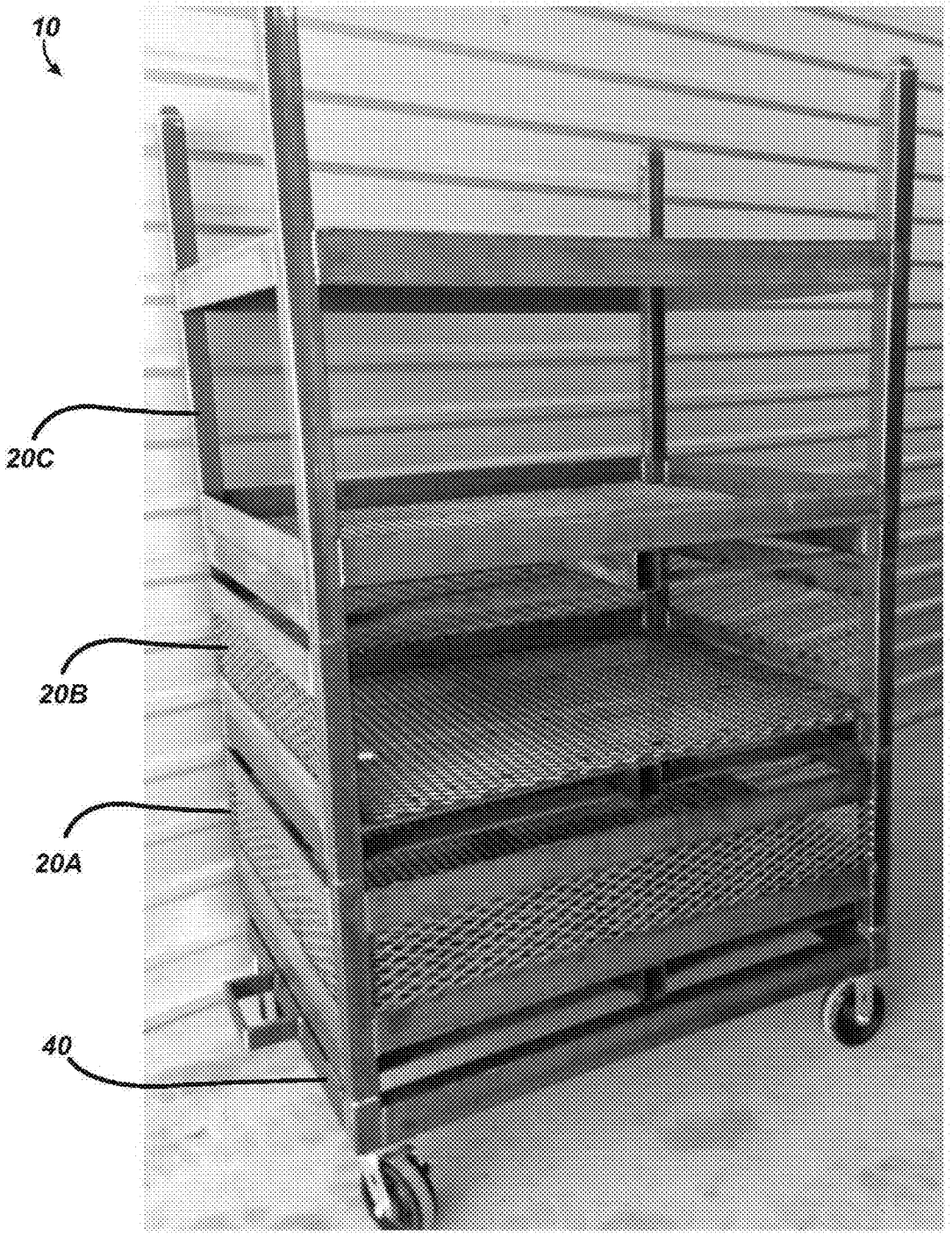

FIG. 6

STACKABLE PALLET SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Appl. 61/758,405, filed 30-Jan.-2013, which is incorporated herein by reference.

BACKGROUND OF THE DISCLOSURE

[0002] Pallets are used in a number of industries to hold items for various purposes. For example, pallets hold items for shipping and storage before the particular items are individually distributed. In a machine shop, factory, or other work environment, pallets can hold items during the process of assembly, manufacture, and eventual transport. Although pallets are very useful, they can be hard to move or handle, especially in environments where a forklift or other device is not readily available or accessible. What is needed is a way to store items on pallets in a way that can meet the needs of a user.

[0003] The subject matter of the present disclosure is directed to overcoming, or at least reducing the effects of, one or more of the problems set forth above.

SUMMARY OF THE DISCLOSURE

[0004] A stackable pallet system for holding items includes a stand and a plurality of stackable pallets. The stackable pallets are stackable one on top of the other and on the stand. Each of the stackable pallets has a top, a bottom, and sides, and each has vertical supports connected to one another along the sides. One or more of the vertical supports has a top connector disposed at the top of the stackable pallet and has a bottom connector at the bottom of the stackable pallet. The bottom connector on a top one of the stackable pallets is adapted to engage the top connector of a corresponding one of the vertical supports on a bottom one of the stackable pallets.

[0005] The stand similarly has a top, a bottom, and sides and has vertical supports connected to one another along the sides of the stand. One or more of these vertical supports has a top connector disposed at the top of the stand. The top connector on the top of the stand can engage the bottom connector of a corresponding one of the vertical pieces on the pallet stacked on the stand.

[0006] At least one lock can removably affixes stacked ones of the vertical supports to another, and the stand can include casters disposed on a bottom of the stand. The top connector can be a toe disposed on a top end of the vertical support, and the bottom connector can be a receptacle disposed in a bottom end of the vertical support. When vertical supports are stacked together, the receptacle receives the toe inserted therein. In a particular implementation, the toe includes a cap having edges attached to the top end of the vertical support, where the cap has a central portion extending from the edges.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. **1** illustrates stackable pallets of a pallet system according to the present disclosure.

[0008] FIG. **2**A illustrates a first side of one of the stackable pallets in FIG. **1**.

[0009] FIG. **2**B illustrates a second side of the stackable pallet in FIG. **2**A.

[0010] FIG. **2**C illustrates a reverse arrangement of toe and receptacles for the disclosed stackable pallets.

[0011] FIG. **3**A illustrate an isolated perspective view of a toe for the stackable pallet system of the present disclosure.

[0012] FIG. **3**B illustrates the toe of FIG. **3**A disposed on a top end of a vertical corner piece of a stackable pallet.

[0013] FIG. **4** illustrates a particular arrangement of stackable pallets on a stand of the disclosed system.

[0014] FIGS. **5**A-**5**B illustrate perspective views of other types of stackable pallets for the disclosed system.

[0015] FIGS. **5**C-**5**D illustrates embodiments of hinged or removable sidewalls for the disclosed stackable pallets.

[0016] FIG. **6** illustrates another particular arrangement of stackable pallets on a stand.

[0017] FIGS. **7**A-**7**B illustrate types of locking mechanisms for the stackable pallets of the present disclosure.

DETAILED DESCRIPTION OF THE DISCLOSURE

[0018] FIG. **1** illustrates stackable pallets **20** of a pallet system **10** according to the present disclosure. The pallet system **10** holds any of a variety of items on the stackable pallets **20** which can be moved and stacked on top of one another for storage, transport, and use. The stackable pallets **20** each have a top end **21**, a bottom end **25**, and sides **22***a-d* and each have vertical corner pieces or supports **26** connected to one another at intersections of the sides **22***a-d*. Each corner piece **26** has a top connector or toe **30** disposed at a top end and has a bottom connector or receptacle **28** at a bottom end. To stack the pallets **20**, the bottom connector **28** engages the top connector **30**. In particular, the receptacle **28** of each corner piece **26** on a top one of the stackable pallets **20** is adapted to receive or fit on the toe **30** of a corresponding one of the corner pieces **26** on a bottom one of the stackable pallets **20**.

[0019] In general, the pallet **20** can be composed of any suitable materials, such as metal, wood, plastic, or the like, depending on the durability required and the items to be held. As shown, the pallets **20** can have four sides **22***a-d*, although other configurations of three or more sides can be used. Additionally, the vertical pieces **26** need not be specifically at the corners of the sides **22***a-d*.

[0020] The corner pieces **26** are structural in nature and, therefore, can be constructed in a manner to support a significant amount of weight. In fact, the weight of items on the pallet's surface **24** and from other pallets **20** stacked above transfers to the corner pieces **26**, which can stably support the load. The corner pieces **26** in one particular implementation can be hollow square tubing composed of metal and can be 2-inches wide. The receptacle **28**, then, of the corner piece **26** can be the open, hollow ends of the tubing used. Of course, the pieces **26** can be cylindrical, solid, or other shape.

[0021] The pallet **20** can be rectangular, square, triangular, round, oval, or any other shape. The current configuration shown is rectangular. In overall size, one configuration of the rectangular pallet **20** can be 17-in. high, 36-in. wide along the short sides **22***a-b*, and 44-in. along the long sides **22***c-d*. The bottom ends of the corner pieces **26** can extend about 3-in. below the lower edge of the sides **22***a-d*, while the top end and toe **30** can extend about 2-in. above the upper end of the sides **22***a-d*. Of course, other sizes can be used depending on the items to be held with the pallet **20**.

[0022] As also shown, the bottom end **25** of the pallets **20** has a rack surface **24** for placing and holding items thereon. The rack surface **24** depicted here is latticed metal mesh, but

another other suitable surfaces can be used, such as a flat surface, sheet metal, lateral slats, bars, etc.

[0023] The sides **22***a-d* of the pallet **20** may also have surfaces or sidewalls **23**. For example, FIG. **2**A shows a long side **22***c-d* of a stackable pallet **22**. The side **22***c-d* has a sidewall **23** constructed by cross members or slats **23***a-b* on upper and lower edges of a metal mesh **23***c*. Any number of other constructions can be used for the sidewall **23**. The benefit of using the mesh **23***c* is that the items held on the pallet's rack surface **24** can be seen through the mesh **23***c*. The slats **23***a-b* and mesh **23***c* connect between adjoining corner pieces **26** to form the sidewall **23** on the side **22***c-d* of the pallet **20**. The slats **23***a-b* can be L-shaped bars that form a bottom edge to support the rack surface **24** and that form a side edge to help hold items on the rack surface **24**.

[0024] As shown in FIG. **2**B, a short side **22***a-b* of the stackable pallet **20** shows how the rack surface **24** may be supported underneath by one or more crossbeams **27** that extend between lower slats **23***b*. The need, size, and number of crossbeams **27** depends on how much support is needed for the items to be held on the pallet **20**. The crossbeam **27** can be a 2-in. by 3-in. hollow beam composed of metal or the like.

[0025] As mentioned above, each corner piece **26** of the disclosed pallets **20** has a toe **30** disposed on a top end thereof. Although it is not strictly necessary that each corner piece **26** has a toe **30**, it is preferred that they do for adequate support. As shown in FIG. **3**A, the toe **30** can be a nesting cap having edges **32** that surround an extended central portion **34**. As shown in FIG. **3**B, the edges **32** attached by welding or the like to the top end of the corner pieces **26** so that the extended central portion **34** extends beyond the top end. The extended portion **34** can be square in shape and can be about 1-in. wide for use with corner pieces **26** that are 2-in. square tubing.

[0026] As will be appreciated, various other types of toes can be used. Moreover, instead of having the toe **30** for the top connector at the top end and having the receptacle **28** for the bottom connector at the bottom end of the corner pieces **26**, the reverse arrangement could be used as shown in FIG. **2**C. As such, reference to top and bottom here and in the claims is merely meant to be illustrative for the purposes of understanding.

[0027] As noted previously, the stackable pallets **20** can be stacked one on top of another for the purposes of storage, transport, and use. A particular arrangement of stackable pallets **20** for the system **10** illustrated in FIG. **4** has a stand **40** on which the stackable pallets **20** can stack. The stand **40** is similar to the stackable pallets **20** having a top end **41**, a bottom end **45**, and sides **42**. Vertical corner pieces or supports **46** are connected to one another at intersections of the sides **42** of the stand **40**, and each corner piece **46** has a top connector or toe **48** disposed at its top end.

[0028] During use, the stackable pallets **20** can stack one on top of the other on the stand **40**. In particular, the receptacle **28** of each corner piece **26** on the bottom one of the stackable pallets **20** receives or fits on the toe **48** of a corresponding one of the corner pieces **46** on the stand **40**. Then, additional stackable pallets **20** can stack thereon as described previously. Finally, the entire stack can be moved about on a floor using casters **44**, wheels, or the like disposed on the bottom end **45** of the stand **40**, preferably at the corner pieces **46**.

[0029] Previous embodiments of the stackable pallets **20** have had sidewalls enclosing all the sides **22***a-d* of the pallet **20**. This is not strictly necessary because other embodiments of pallets **20** may have fewer closed sidewalls. In FIG. **5**A, for example, the stackable pallet **20** has three sides **22***b-d* enclosed with sidewalls **23**, but has one open side **22***a* allowing items to be inserted and removed from the rack surface **24** through that opened side **22***a*. In another example of FIG. **5**B, a stackable pallet **20** has four open sides **22***a-d*.

[0030] In still other embodiments, one or more sidewalls **23** may be removable or may be openable on a side **22** of the pallet **20**. In one example shown in FIG. **5**C, a sidewall **23** can be affixed by hinges **50**, fasteners, or the like to one of the sides **22***a-d* of the pallet **20** in FIG. **5**A. In another example shown in FIG. **5**D, a sidewall **23** can have end tubes **52** that slide on adjacent corner pieces **26** to form a removable sidewall **23** on a side **22***a-d* of the pallet **20** in FIG. **5**B. These and other configurations are possible.

[0031] As shown in FIG. **6**, the various types of stackable pallets **20** can be stacked one on top of the other as before and can be used on a stand **40**. In FIG. **6**, for example, the system **10** has a bottom most pallet **20**A with four enclosed sides stacked on the stand **40**. The next stacked pallet **20**B has one open side, and the top pallet **20**C has all four open sides. Moreover, the embodiment of the top pallet **20**C depicted in FIG. **6** has two rack surfaces **24** disposed between the corner pieces **26**. These and other configurations of pallets **20** can be stacked in any desirable order on the stand **40**.

[0032] Filling and emptying the stacked pallets **20** in FIGS. **4** and **6** can be performed as expected, depending on whether a given pallet **20** has open sides or not or has to be filled or emptied when another pallet is not stacked on top of it. When it is desired to move the stacked pallets **20** by lifting it on a truck, shelf, or the like with a forklift or other device, the forks can fit under the bottom end of the lower most pallet **20** to lift all of the pallets **20** while leaving the stand **40** in place. The stacked pallets **20** can be tied together with tie rods disposed longitudinally thereabout to hold the stack together if desired.

[0033] In addition, the various stacked pallets **20** can be locked together and can be locked to the stand **40** using any of a number of locking mechanisms or fasteners. As shown in FIG. **7**A, for example, one locking mechanism **60** for the stackable pallets **20** can use a c-clamp **62**, clip, or the like that fits in cross-holes in the corner pieces **26** between stacked pallets **40**. Fasteners **64**, such as butterfly nuts or the like, can then thread onto the free ends of the c-clamp **62** to affix the two corner pieces **26** together. A similar mechanism can be used on one or more of the other corner pieces **26** between the stacked pallets **20**.

[0034] As shown in FIG. **7**B, another locking mechanism **70** for the stackable pallets **20** can use a bolt **72** that fits in cross-holes in the corner piece **26** at the receptacle **28** and that fits in a cross-hole **31** in the toe **30** between stacked pallets **40**. Here in FIG. **7**B, the toe **30** is depicted as an extended bar, but other shapes can be used. A fastener **64**, such as butterfly nuts or the like, can then thread onto the free end of the bolt **72** to affix the toe **30** inside the receptacle **28**. A similar mechanism can be used on one or more of the other corner pieces **26** between the stacked pallets **20**.

[0035] When one or more of the corner pieces **26** of stacked pallets **20** are affixed together with the locking mechanisms **60** and **70** in the manner described, the stack of pallets **20** can have improved stability. Although not shown, locking mechanisms such as the c-clamp device **60** and bolt device **70** of FIGS. **7**A-**7**B can be used at the junction of the stand's corner pieces **46** and those corner pieces **26** of the pallet **20** stacked thereon.

[0036] The foregoing description of preferred and other embodiments is not intended to limit or restrict the scope or applicability of the inventive concepts conceived of by the Applicants. It will be appreciated with the benefit of the present disclosure that features described above in accordance with any embodiment or aspect of the disclosed subject matter can be utilized, either alone or in combination, with any other described feature, in any other embodiment or aspect of the disclosed subject matter.

[0037] In exchange for disclosing the inventive concepts contained herein, the Applicants desire all patent rights afforded by the appended claims. Therefore, it is intended that the appended claims include all modifications and alterations to the full extent that they come within the scope of the following claims or the equivalents thereof.

What is claimed is:

1. A pallet system for holding items, the system comprising:

a plurality of stackable pallets being stackable one on top of the other, the stackable pallets each having a top, a bottom, sides and vertical supports,

one or more of the vertical supports having a top connector disposed at the top of the stackable pallet and having a bottom connector disposed at the bottom of the stackable pallet,

the bottom connector on a top one of the stackable pallets adapted to engage the top connector of a corresponding one of the vertical supports on a bottom one of the stackable pallets.

2. The system of claim **1**, wherein each stackable pallet comprises at least one rack surface disposed across the stackable pallet.

3. The system of claim **2**, wherein at least one of the stackable pallets comprises a first of the at least one rack surfaces disposed above a second of the at least one rack surfaces.

4. The system of claim **1**, wherein a first of the stackable pallets comprises one or more sidewalls covering one or more of the sides of the first stackable pallet and connected across adjoining ones of the vertical supports.

5. The system of claim **4**, wherein at least one of the one or more sidewalls comprises hinges disposed on an edge of the at least one sidewall and connected to the bottom of the first stackable pallet.

6. The system of claim **4**, wherein at least one of the one or more sidewalls comprises edges removably connected to the adjoining ones of the vertical supports.

7. The system of claim **4**, wherein the first stackable pallet has three of the sidewalls covering three of four of the sides of the first stackable pallet.

8. The system of claim **1**, further comprising at least one lock removably affixing one of the vertical supports disposed at the top one of the stackable pallets to another of the vertical supports disposed at the bottom one of the stackable pallets.

9. The system of claim **1**, further comprising a stand on which the stackable pallets are stackable.

10. The system of claim **9**, wherein the stand comprises vertical supports connected to one another along sides of the stand, one or more of the vertical supports having a top connector disposed at a top of the stand, wherein each top connector on the one or more vertical supports is adapted to engage the bottom connector of a corresponding one of the vertical supports on the stackable pallet stacked on the stand.

11. The system of claim **9**, wherein the stand comprises casters disposed on a bottom of the stand.

12. The system of claim **1**, wherein the stackable pallets each have four of the sides and four of the vertical supports disposed at intersections of the four sides.

13. The system of claim **1**, wherein the top connector comprises a toe disposed on a top end of the vertical support.

14. The system of claim **13**, wherein the toe comprises a cap having edges attached to the top end of the vertical support, the cap having a central portion extending from the edges.

15. The system of claim of claim **13**, wherein the bottom connector comprises a receptacle disposed in a bottom end of the vertical support, the receptacle receiving the toe inserted therein.

16. A stackable pallet system for holding items, the system comprising:

a stand having a top, a bottom, sides, and first vertical supports, one or more of the first vertical supports having a top connector disposed at the top of the stand; and

a plurality of stackable pallets being stackable one on top of the other and on the stand, the stackable pallets each having a top, a bottom, sides, and second vertical supports, one or more of the second vertical supports having a top connector disposed at the top of the stackable pallet and having a bottom connector at the bottom of the stackable pallet,

the bottom connector on a top one of the stackable pallets adapted to engage the top connector either of the stand or a corresponding one of the second vertical supports on a bottom one of the stackable pallets.

17. The system of claim **16**, wherein the top connector comprises a toe disposed on a top end of the first or second vertical support; and wherein the bottom connector comprises a receptacle disposed in a bottom end of the second vertical support, the receptacle receiving the toe inserted therein.

18. The system of claim **17**, wherein the toe comprises a cap having edges attached to the top end of the vertical support, the cap having a central portion extending from the edges.

19. The system of claim **16**, further comprising at least one lock removably affixing stacked ones of the first or second vertical supports to one another.

20. The system of claim **16**, wherein the stand comprises casters disposed on a bottom of the stand.

* * * * *