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(54) **BODDY DOLLIE**

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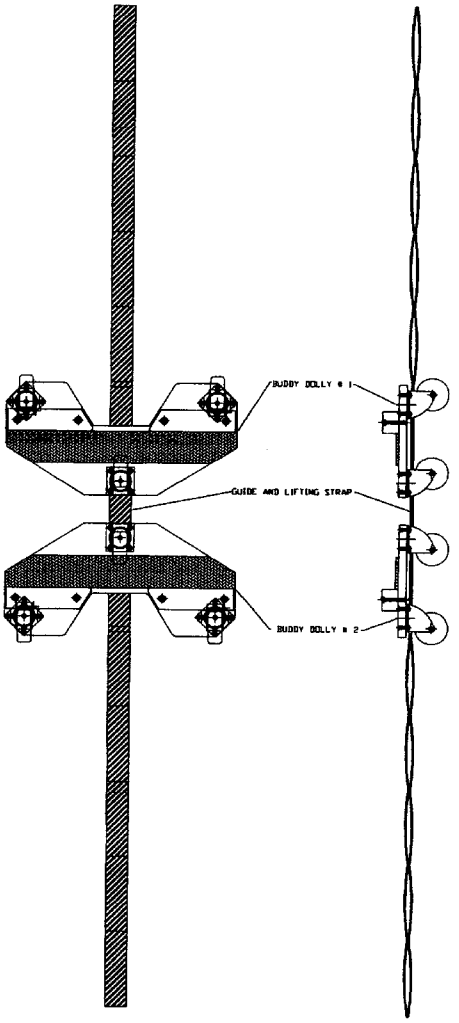
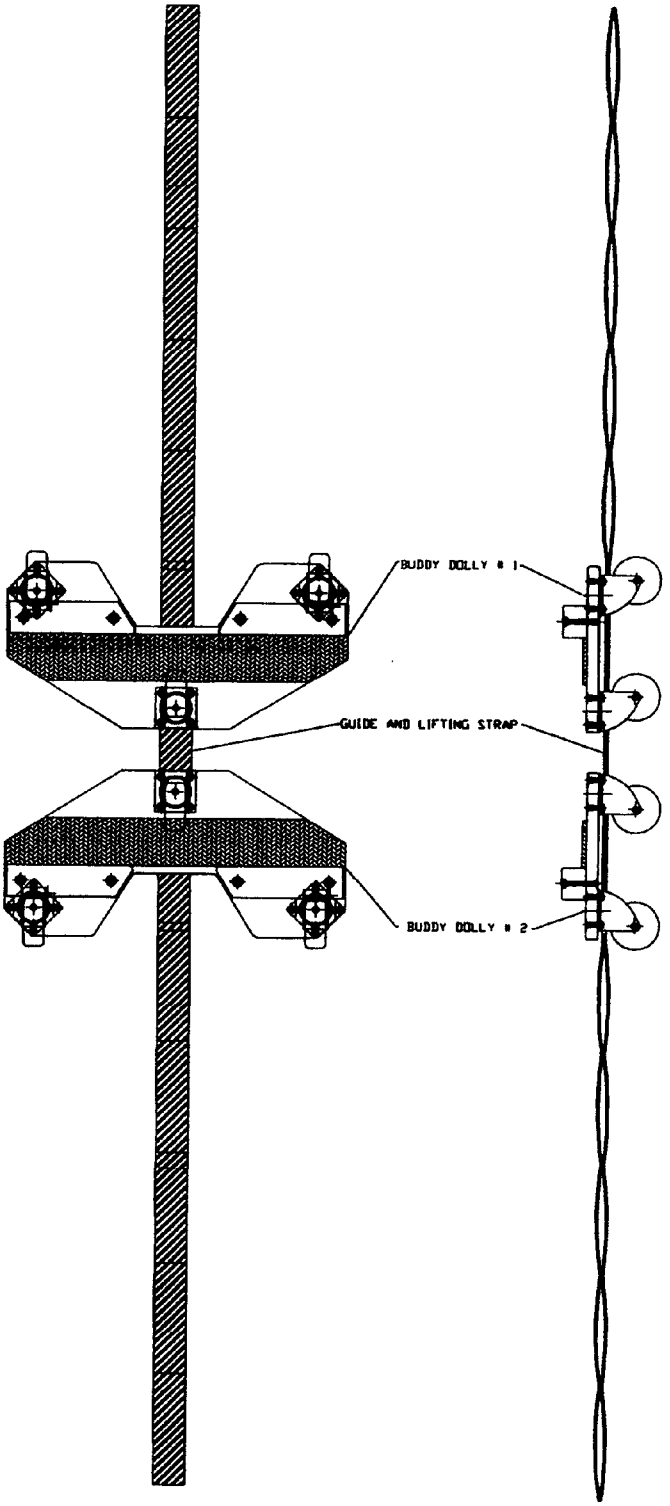
(57) **ABSTRACT**

Buddy Dolly is designed to move heavy objects such as furniture or appliances, and is made with two platforms and a guide/lifting strap. The two identical platforms are mirror-images of each other containing a strip of non-skid material, and two blocks each to prevent slippage that are balanced upon three, pivoting casters. The casters are secured to each platform which are placed under the legs or weight-bearing sides of heavy furniture or appliances. After each platform has been placed, the guide/lifting strap is threaded under the Dolly platforms, and is used to guide the object into the desired position or placement, control movement without use of a handle, and is used to lift the object by holding the strap through the wrist holes. The Buddy Dolly allows for multidirectional movement and can be turned 90 degrees in tight, narrow spaces.

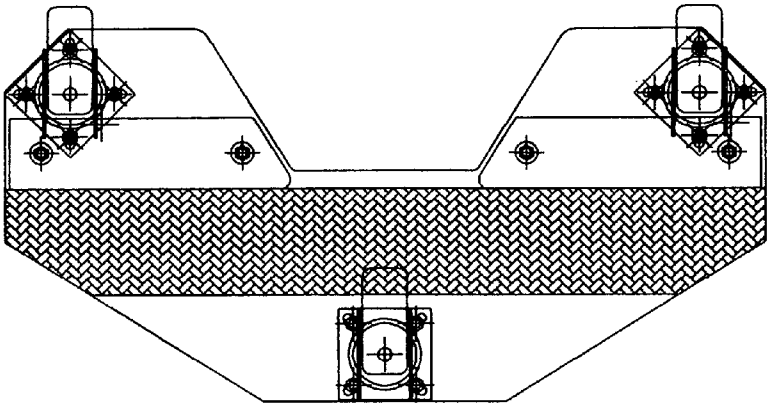
COMPOSITE DRAWING OF
BUDDY DOLLY SYSTEM



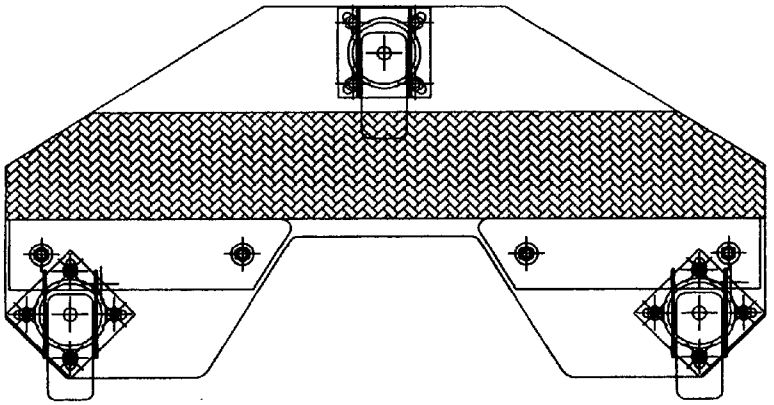
DRAWING # 1 - COMPOSITE DRAWING OF BUDDY DOLLY SYSTEM

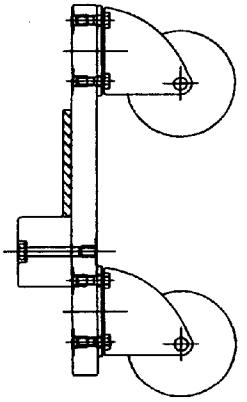


DRAWING #2 - FINAL DOLLY ASSEMBLY

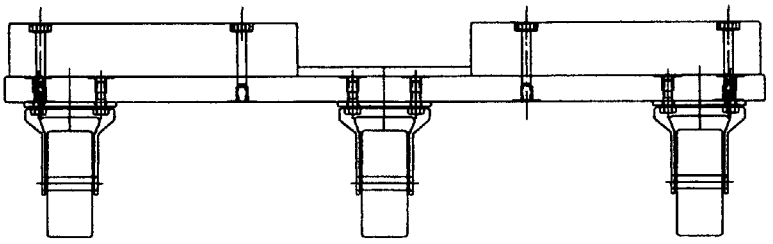


TOP VIEW OF DOLLIES





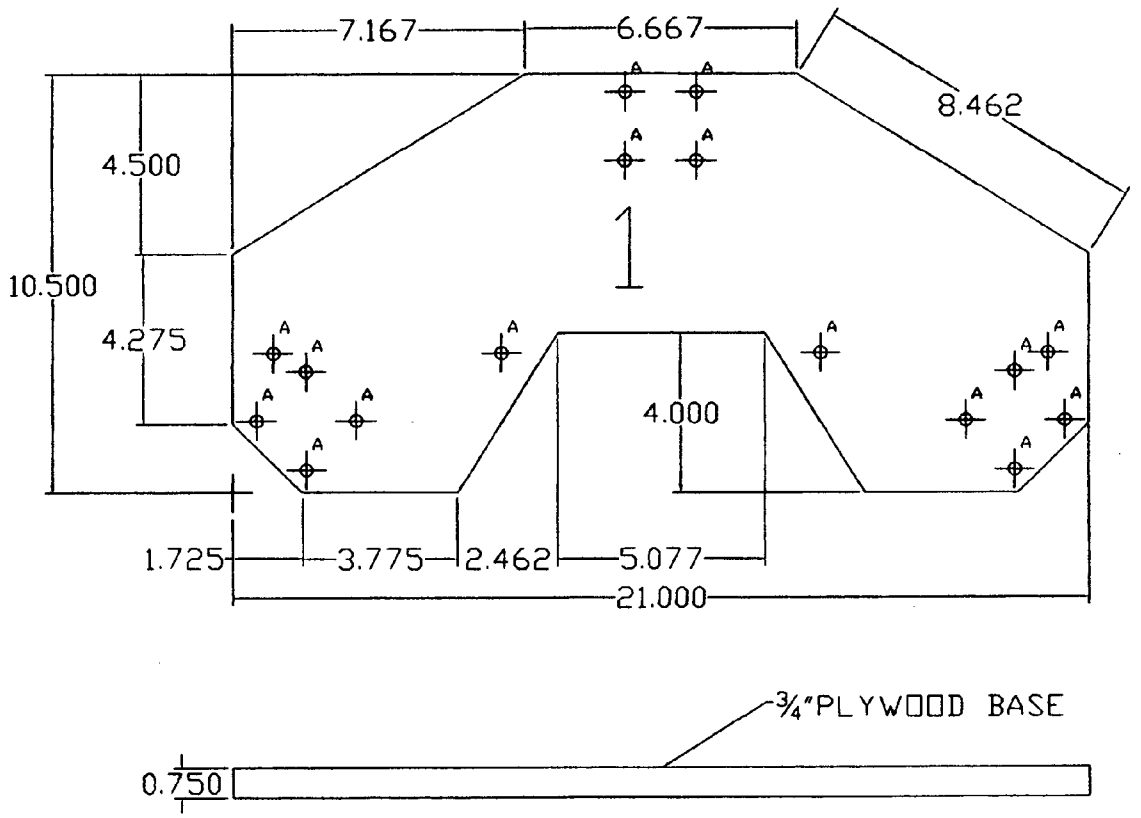
RIGHT SIDE VIEW



BACK SIDE VIEW

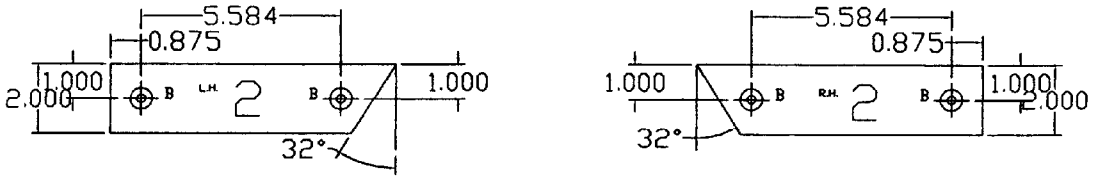
DRAWING # 3 BASE PLATE

A = 5/16" DIA. THRU HOLE 16 PLACES

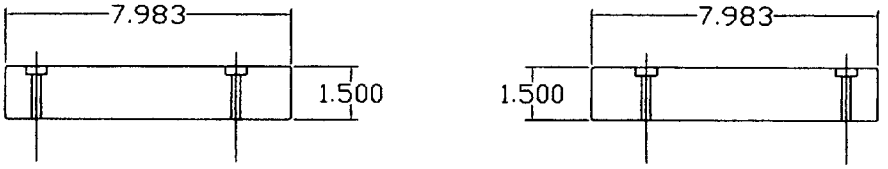


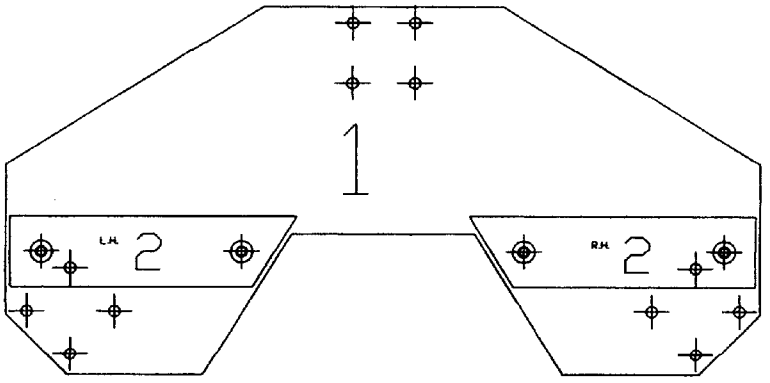
DRAWING # 4 STOP BLOCK DETAIL AND ASSEMBLY ON BASE

B = DRILL 17/64" THRU & C'BORE 5/8" DIA. X 5/16" DEEP

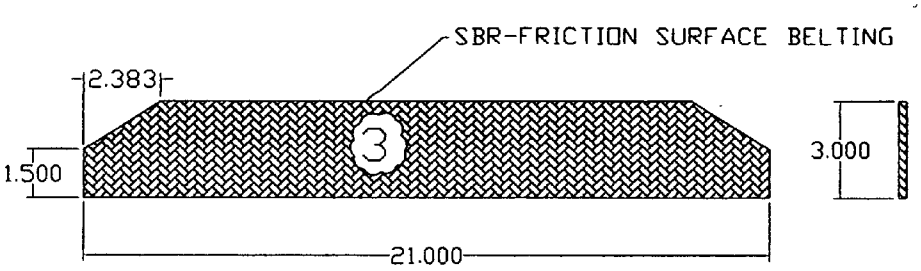


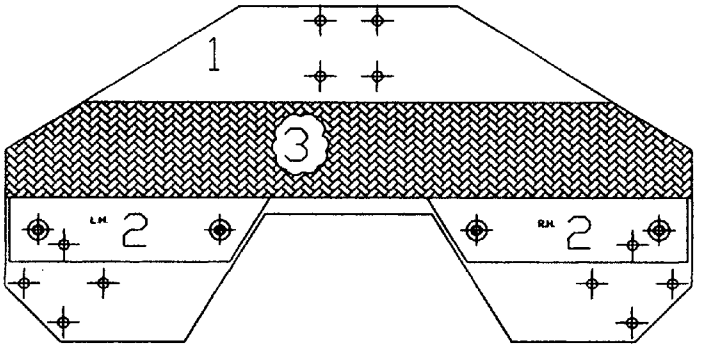
PINE WOOD STOP BLOCKS





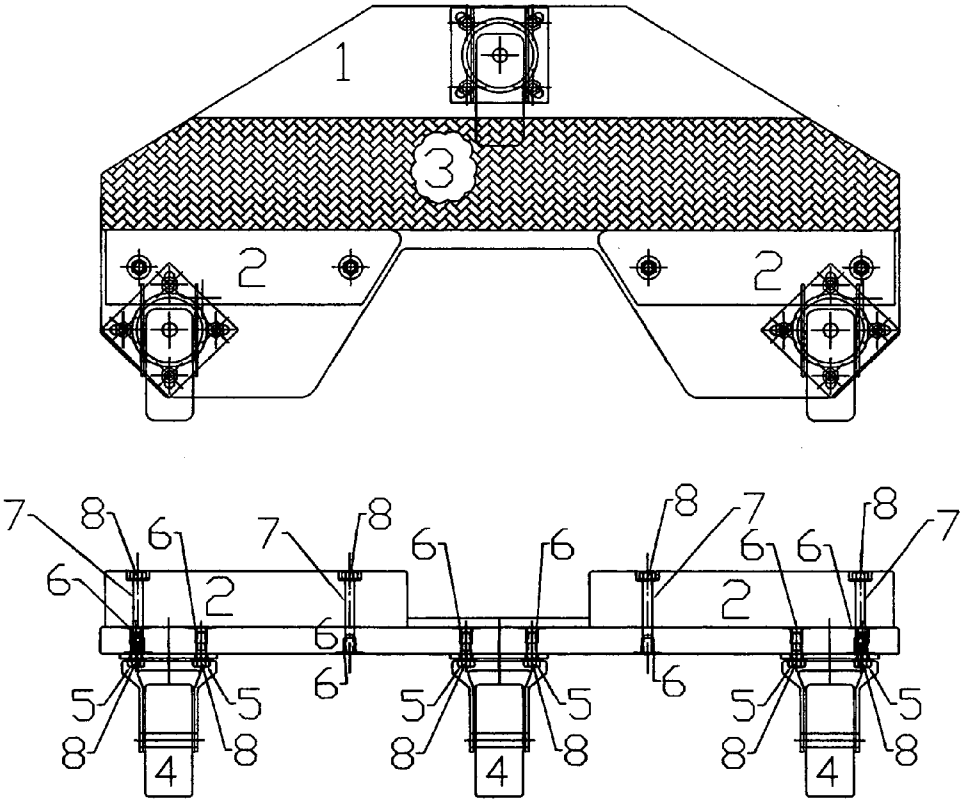
DRAWING # 5 - SKID PAD DETAIL AND INSTALLED ON BASE PLATE WITH STOP BLOCKS



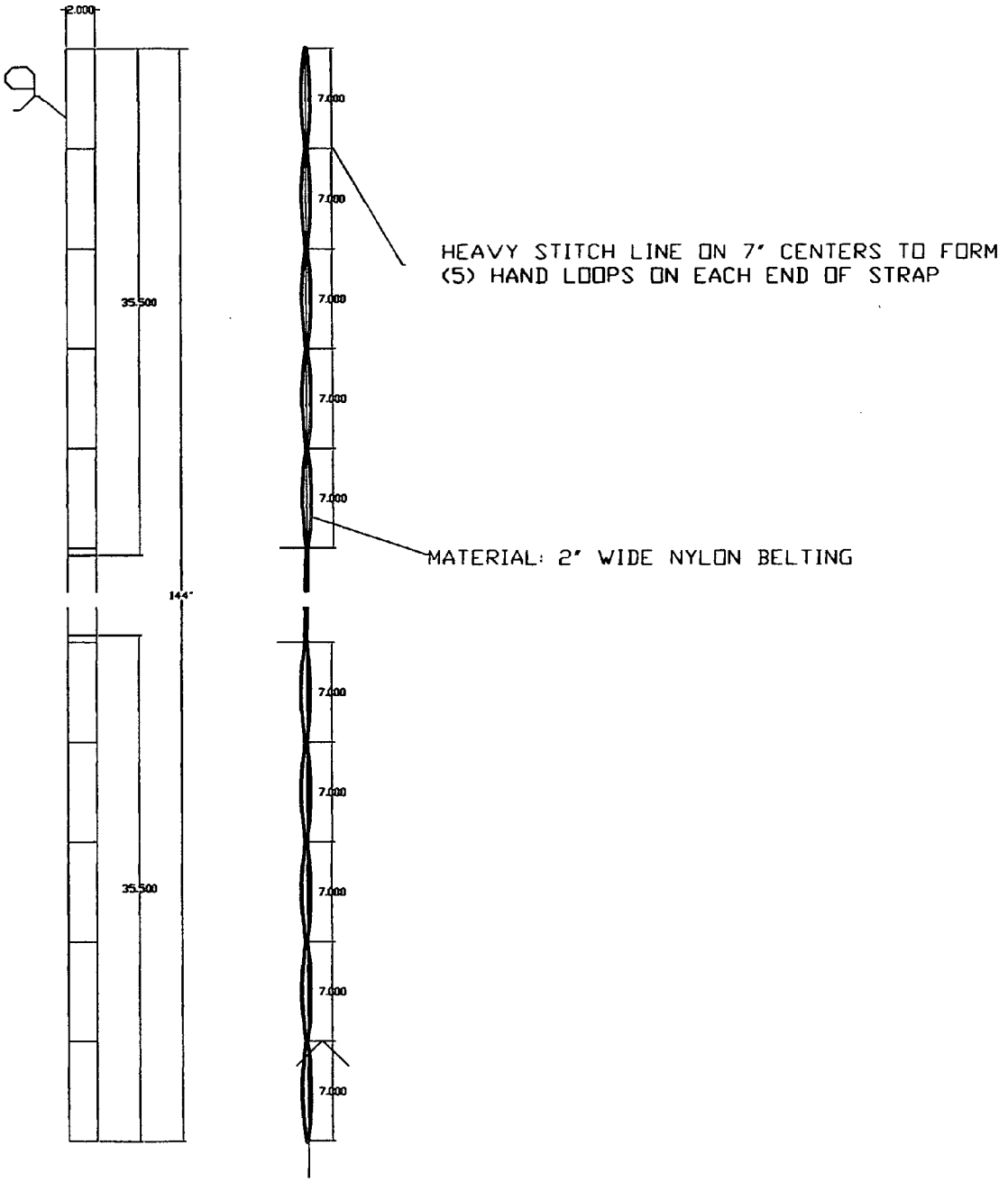


DRAWING #6 - DETAIL COMPONENT ASSEMBLY DRAWING WITH CASTERS INSTALLED

#1-¾"PLYWOOD BASE
#2-PINE WOOD STOP BLOCKS(2 REQ'D.)
#3-SKID PAD
#4-3" SWIVEL CASTERS (3 REQ'D.)
#5-1/4-20 X ¾"HEX HEAD BOLT.(12 REQ'D.)
#6-I/4-20 X 5/16"BARBED TEE NUT.(16 REQ'D.)
#7-1/4-20 X 2" HEX HEAD BOLT.(4 REQ'D.)
#8-¼"I.D. FLAT WASHER.(16 REQ'D.)



DRAWING # 7 - GUIDE & LIFTING STRAP DETAIL



BODDY DOLLIE

CROSS-REFERENCED TO RELATED MATERIALS

[0001] Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not Applicable

REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISK APPENDIX

[0003] Not Applicable

BACKGROUND OF THIS INVENTION

[0004] The moving industry has been hindered by inherent dangers of injury to workmen and destruction of property by lifting and maneuvering heavy pieces of furniture or appliances in homes, offices and industrial workplaces. Many devices currently used to move objects are unusable when the object must be lifted over or around obstacles such as steps or stairs. The invention submitted here, The Buddy Dolly not only maneuvers in tight spaces such as hallways and around other furniture or equipment, it may also be lifted to go down stairs or over steps without changing from the moving position. The unique usage of the guide and lifting strap enables two movers to simultaneously tighten the strap to lift one side of the object or the other, and then loosen to resume movement.

BRIEF SUMMARY OF THE INVENTION

[0005] The dollie of the present invention titled the "Buddy Dolly, is designed to allow two people to move, guide and lift heavy objects, maneuvering them around narrow hallways and to make 90 degree turns. The Buddy Dolly consists of two identical wooden platforms shaped in a truncated pyramid, that are 21 inches in length. The platforms are supported by three, three-inch pivoting casters, secured by various bolts as specified in drawing **6**. Each platform has a strip of non-skid material across the platform and a wooden stopping block. The Buddy Dolly's movement is controlled by a "guide and lifting strap" that is 17.91 feet in length. The strap is stitched on 7 inch centers to form five hand loops that are on each end. Each mover threads their hand, and wrist through one of the loops to guide or lift the heavy object.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0006] **FIG. 1** (Drawing #**1**) Composite Drawing of the Buddy Dolly and the lift and guide strap

[0007] **FIG. 2** (Drawing #**2**) Final Assembly Top Down and side views of the Buddy Dolly

[0008] **FIG. 3** (Drawing #**3**) Base Plate [1] Top down detail and side view

[0009] **FIG. 4** (Drawing #**4**) Stop Block [2] Detail and placement upon the Base Plate [1]

[0010] **FIG. 5** (Drawing #**5**) Skid Pad [3] Detail and placement on Base Plate [1]

[0011] **FIG. 6** (Drawing #**6**) Components [4-8] Assembly Detail with Casters [4] Installed, Top Down and Side views

[0012] **FIG. 7** (Drawing #**7**) Guide and Lift Strap [9] Detail

DETAILED DESCRIPTION OF THE INVENTION

[0013] **FIG. 2** The invention consists of a platform placed upon casters which pivot, and a non-skid material and stop blocks placed on the platform to prevent slippage of the objects as they are moved or lifted. **FIG. 3** the Base Plate [**1**] is a platform made from ¾ inch plywood base and is drilled with sixteen holes (A) that are 5/16 inches in diameter. In **FIG. 4** the Base Plate [**1**] is further developed with Stop Blocks [**2**] which are drilled with two holes (B), that are 17/64 inch each in depth. They are counter-bored to ⅝ inch in diameter to 5/16 inches in depth. The Stop Blocks [**2**] are made of pine and will be secured to the Base Plate [**1**] in final assembly (**FIG. 6**). **FIG. 5** shows the detail of the Skid Pad [**3**] which is made of non-skid, SBR-Friction surface belting. The Skid Pad [**3**] is secured to the Base Plate [**1**] by steeples, applied with a steeple gun. **FIG. 6** shows the final assembly of the Buddy Dolly as follows: The Stop Blocks [**2**] are secured to the Base Plate [**1**] from the top to bottom, using a ¼-20×2 inch Hex Head Bolt [**7**] in each hole, that is threaded through a ¼ inch flat washer [**8**] and fastened by a ¼-20×5/16 inch Barbed Tee Nut [**6**]. The Skid Pad [**3**] is secured to the Base Plate [**1**] by using steeple gun. The three inch swiveling casters [**4**] are secured to the Base Plate [**1**] from the bottom to the top, by inserting the ¼-20×¾ Hex Head bolt [**5**] through a ¼ inch flat washer [**8**] and fastened on top by ¼-20×5/16 inch Barbed Tee Nut [**6**]. **FIG. 7** shows the construction of the Lift and Guide Strap [**9**], which is sewn on 7 inch centers to create hand and wrist loops used to guide and lift furniture or other heavy objects.

Invention Description

The Buddy Dollie

The Buddy Dollie is a piece of equipment designed to be used to move heavy objects such as furniture, and appliances.

[0014] The Buddy Dollie is made of three pieces; a pair of wooden supports on rollers (see Attachment #**1**) and a moving strap (see Attachment #**2**) that are designed to work together to easily support the weighted object and to move and maneuver sharp turns in hallways, and lifting the object up or down steps.

[0015] Each wooden support has three rollers that can turn 360 degrees, a rubber pad to prevent slippage and a block to properly place the object. The Buddy Dollie is used with two people who tilt the object forward while one support is placed under one side, then tilted the opposite direction while the other support is placed. Once both supports are placed under the object, the strap is threaded under each support, with each mover holding one end of the strap through a loop on each end, (See picture #**1**)

[0016] Movement of the heavy object is accomplished by each person rolling their support side in the direction of the movement, using the strap to (**1**) guide the movement, or (**2**) lift the object over or down from an obstacle, lifting simul-

taneously on the strap. Maneuvering small hallways, stairs or making narrow turns is possible due to the rollers being able to turn in any direction.

The Buddy Dollie could be used by any entity that must move heavy objects or furniture such as moving services, appliance dealers, furniture businesses etc.

1. (canceled)

2. (canceled)

3. A method for solving a finite element model corresponding to a system in which there is a multi-phase fluid flow comprising:

generating a finite element matrix corresponding to the finite element model, wherein the finite element matrix contains a plurality of coefficients;

adjusting the coefficients to obtain the finite element matrix in which on-diagonal matrix entries are non-negative and off-diagonal matrix entries are non-positive, wherein adjusting the coefficients comprises weighting nodes of each mesh element according to a direction of fluid flow across the mesh element, wherein weighting the nodes of each mesh element according to a direction of fluid flow across the mesh element comprises determining the direction of fluid flow across the mesh element and weighting each node more heavily if the node is upstream from the other nodes of the mesh element and less heavily if the node is downstream from the other nodes of the mesh element; and

generating a solution for the finite element model using the finite element matrix using finite element techniques.

4. The method of claim 3 wherein each node is weighted more heavily if a greater portion of the mesh element is downstream from the node than from other nodes of the mesh element and less heavily if a smaller portion of the mesh element is downstream from the node than from other nodes of the mesh element.

5. The method of claim 3 wherein the finite element matrix corresponds to a system in which there are at least two fluid phases.

6. The method of claim 3 wherein the finite element matrix corresponds to a system in which there are three or more fluid phases.

7. The method of claim 3 wherein the finite element matrix corresponds to a four-dimensional finite element model.

8. The method of claim 3 wherein the system corresponds to an oil reservoir.

9. The method of claim 3 wherein the finite element matrix is configured to produce a solution which is not physically unrealistic at any time.

10. The method of claim 3 wherein the finite element matrix is configured to produce a solution which is non-oscillating.

11. The method of claims **3** further comprising discretizing a model of the system to produce a finite element mesh and generating the matrix based on the finite element mesh.

12. (canceled)

13. (canceled)

14. (canceled)

15. A computer-readable medium which contains a plurality of instructions, wherein the instructions are configured to cause a computer to perform the method for solving a finite element model corresponding to a system in which there is a multi-phase fluid flow comprising:

generating a finite element matrix correspond to the model, wherein the finite element matrix contains a plurality of coefficients;

adjusting the coefficients to obtain the finite element matrix in which on-diagonal matrix entries are non-negative and off-diagonal matrix entries are non-positive, wherein adjusting the coefficients comprises weighting nodes of each mesh element according to a direction of fluid flow across the mesh element, wherein weighting the nodes of each mesh element according to a direction of fluid flow across the mesh element comprises determining the direction of fluid flow across the mesh element and weighting each node more heavily if the node is upstream from the other nodes of the mesh element and less heavily if the node is downstream from the nodes of the mesh element; and

generating a solution for the model using the finite element matrix using finite element techniques.

16. The computer-readable medium of claim 15 wherein each node is weighted more heavily if a greater portion of the mesh element is downstream from the node than from other nodes of the mesh element and less heavily if a smaller portion of the mesh element is downstream from the node than from other nodes of the mesh element.

17. The computer-readable medium of claim 15 wherein the finite element matrix corresponds to a system in which there are at least two fluid phases.

18. The computer-readable medium of claim 15 wherein the finite element matrix corresponds to a system in which there are three or more fluid phases.

19. The computer-readable medium of claim 15 wherein the finite element matrix corresponds to a four-dimensional finite element model.

20. The computer-readable medium of claim 15 wherein the system corresponds to an oil reservoir.

21. The computer-readable medium of claim 15 wherein the finite element matrix is configured to produce a solution which is not physically unrealistic at any time.

22. The computer-readable medium of claim 15 wherein the finite element matrix is configured to produce a solution which is non-oscillating.

23. The computer-readable medium of claim 15 wherein the method further comprises discretizing a model of the system to produce a finite element mesh and generating the finite element matrix based on the finite element mesh.

24. A method of predicting fluid flow in a fluid reservoir, the method comprising:

generating a mesh representation of the fluid reservoir having a plurality of mesh elements defined by a plurality of nodes, each of the plurality of mesh elements representative of a regional portion of the fluid reservoir,

generating a matrix-based representation of fluid flow comprising matrix elements associated with a mesh element; and

selectively weighting the matrix elements based on fluid flow direction in the regional portion of the fluid reservoir represented by the mesh element associated

with the matrix element by weighting each node of the mesh element more heavily if the node is upstream from the other nodes of the mesh element and less heavily if the node is downstream from the other nodes of the mesh element.

25. The method of claim 24, wherein the fluid reservoir is a hydrocarbon reservoir.

26. Newly added) The method of claim 24, wherein the matrix-based representation comprises a four-dimensional finite element representation.

27. The method of claim 24, wherein the matrix-based representation of fluid flow corresponds to a system in which there are at least two fluid phases.

28. The method of claim 24, wherein the matrix-based representation of fluid flow corresponds to a system in which there are tree or more fluid phases.

* * * * *