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(54) **STACKABLE, FOLDING MULTI-UNIT WASHSTAND**

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LAVABO MULTIPLE DEPLIANT ET EMPILABLE

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## Description

### OBJECT OF THE INVENTION

[0001] The object of the present invention is to provide for a multiunit washstand, which is capable to render services to several people simultaneously, which can be installed quickly and easily, which can be foldable and stackable and can be aligned with other multiunit washstands of the invention and furthermore shows a good appearance which does not wear out as time passes.

[0002] As a consequence of the objectives listed above a time-winning situation is created with respect to the mounting / dismounting of the washstands and the storage and transport of reduced volume, and the possibility to render the service to a number of users which is as big as needed, as this number will depend on the quantity of the aligned units.

### BACKGROUND OF THE INVENTION

[0003] In general, in all those places being selected for events wherein there are massive gatherings of persons like military maneuvers, camp-outs, outdoor concerts, and patronal feasts of towns or of capital city suburbs, there are no sanitary installations enough to give the services to the attending public. A fundamental part of the mentioned services is that related to personal hygiene, dishes washing or kitchen belongings rinsing/ washing, that for it to be provided, equipment is needed to be installed in the place of the event, as well as a water supply and the collection of the residual water. The objective to provide a multiple washstand that is installable in points such as the aforementioned ones have been stated in different patents.

[0004] The spanish application UO262513(Avelino Martinez) titled "Mountable multiple autonomous washstand" claims of an autonomous multiple washstand characterized by a water deposit situated on a tripod, whose fastening device is a frame which at the same time is the support of the equipped washbasins. The water falls from said container by means of hoses and taps (faucets), whereby the set-up/dismantling is carried out through a mechano-type assemblage by means of drive-pins, pattern screws, eyelets, southern cones, magnets and L shaped supports.

[0005] The Patent US3069694 of M.E. McCormack titled "Portable dismountable multiple washstand" claims of a portable foldable dismountable washstand that is basically composed of a rectangular shaped horizontal structure, which forms every two by two a series of squares in which several semi-spherically shaped independent washstands are supported. The washstands are mounted incorporated on said squares and a piping is mounted on the longitudinal axis of the frame, which serves the taps that are installed in each washstand. The equipment is also composed of several legs over which the frame is mounted.

[0006] In the aforementioned patents, there exists a problem of slow mounting procedure, that requires specific manuals both for its correct start as much as for its dismantling and storage. Although some of its parts are stackable, like the deposit and the washstands, in pyramidal form in the spanish patent, and the washstands in a semi-spherical form in the USA patent, not the whole equipment is. Therefore, it is desirable to have an equipment that provides for an easier setting up and dismantling and a more efficient storage and transportation.

[0007] What is aspired for is a structure that avoids the aforementioned problems, integrating all the necessary devices into one unit, that way avoiding manuals for set-ups/dismantling and providing a quick installation and a piling up and complete transporting of all the devices that it is composed of.

[0008] The basic idea of the actual invention is to obtain an equipment that is unfolded instead of being assembled by mounting, being its handling so elementary that instructions are not needed. The deployment of the equipment is executed in just a few seconds, since the placing of screws or nuts/bolts is not necessary, which is obtained because there is no part that is not integrated in the equipment, which moreover provides the advantage of not having to lose parts or elements of the ensemble.

[0009] To get the service functioning all that is needed is to connect the water supply and the drainage to the multiple washstand of the actual invention. Depending on where the event is taking place, the water supply can be taken from the local water network itself or from a water-tank truck, and the means of drainage can be as simple as gutters or hoses that take the water to a drain or, better yet, to tank trucks that suction the residual water to leave the environment totally clean.

[0010] Mass events wherein the invention has an application are of limited duration and with a floor use not exclusive for such an event, therefore, a very important objective of the invention is the rapid and easiness to maneuver in the installation/dismounting of mentioned washstands. On the other hand, said washstands must be stored when not in use, or transported aptly from its storage place to the place where it will be used, and so another important objective of the invention is for it to occupy a reduced space during the storage and transport phases.

[0011] The aforementioned characteristics of speed and easiness to maneuver in the installation/dismantling of the washstand, as of the space used during the storage and transport phases, is obtained with the stackable storable multiunit washstand of the invention.

### DESCRIPTION OF THE INVENTION

[0012] The invented fold-out storable multiple washstand is composed of, as principal elements, a basin or bucket, a water supplier, four foldable legs for the sustaining of the basin and four foldable legs for the sustain-

ing of the water supplier.

**[0013]** The basin or bucket is provided with the necessary means for the union of said basin with the four foldable legs in it's sides for the sustaining of the basin, which stay stuck when they have been totally unfolded. Also, the basin is provided in its top surface with four handrails with guides over which each one of the inferior ends of every one of the foldable legs for sustenance of the water supplier can slide, which besides joining said basin with said supplier, allows the setting of the said water supplier open for service or in the piling position. In the vicinity of the lateral ends, the bucket or basin is provided with two holes, provided with vertical cylinders, which are located in the central and lowest area of the basin, which serve as a drainage. Lastly, the basin is also provided with a central hole which serves as a pathway for the hose that supplies water and has to be joined to the water supplier.

**[0014]** The water supplier is provided at its sides with the necessary means for the union of said water supplier with the top ends of the four foldable legs of the sustenance of the water supplier, and also with an access with a threaded sleeve joint that serves as a union with the water supply hose, from this part on providing for a set of pipes for which the water connects with several lateral holes in which the faucets that are managed by the users are installed.

**[0015]** In the case that a multiple of washstands as described is needed, some could be added on through contact between the extreme faces of the basins that way forming a continuous longitudinal installation of the length necessary.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

**[0016]** For a better understanding of the actual invention, a practical embodiment thereof is described on the basics of the attached Figures, wherein:

Fig.1 - Shows an elevation schematic view and profile of the invented multiple washstand with the water supplier and the unfolded sustaining legs of the basin.

Fig.2 - Shows a top schematic view of the multiple washstand of Fig.1 with the folded water supplier.

Fig.3 - Shows a top schematic view and profile of the multiple washstand of Fig.1 with the folded sustaining legs of the basin.

Fig.4 - Shows a top view of the basin or bucket

Fig.5 - Shows a section in accordance with Plan A-A of fig.4.

Fig.6 - Shows a partial top view of the water supplier and its' union with the basin or bucket.

Fig.7 - Shows a partial top view of one of the sustaining legs of the basin or bucket and the union with the same.

Fig.8 - Shows a profile view of the piling of the four multiple washstands of the preferred embodiment of the invention.

Fig.9- Shows a schematic top view of the multiple washstand of Fig.1 in which a platform of mirrors is added as a complement.

Fig.10 - Shows the steps to be taken to assemble the parts of the sustenance of the platform of mirrors with the water supplier.

Fig.11 Shows a section view in accordance with plan B-B of figure 9, of the sustaining parts over which the platform of mirrors that complement the multiple washstand is set on.

### **PREFERRED EMBODIMENT OF THE INVENTION**

**[0017]** Figs.1-3 shows a preferred embodiment of the invented foldable stackable multiple washstand that is composed of a basin or bucket(1), a water supplier(2), four foldable legs(3) of the basin sustenance(1) and four foldable legs(4) for the sustenance of the water supplier (2).

**[0018]** The basin or bucket(1), as can be noted in Figs. 4-5 is formed by the union of two longitudinal profiles(11), two transversal profiles(12) and a plate body(13) of boat keel shape welded on to them. In the longitudinal profiles (11) several primary joining means in joint shape(14,14') is provided with the sustaining legs(3) of the basin(1), and in the top surface of the body(13),(see Fig.5) the joining and screwing means with the water supplier(2) is provided, with mentioned means constituted by a first hand railing(17), a sliding guide(15) and a prime bar(16). In the basin or bucket(1) the drainage(18) is supplied, through which the residual water goes out, and the hole of the hose path(19) through which a hose that supplies the water to the water supplier(2) passes.

**[0019]** The water supplier(2) has a straight parallelo-pipedic rectangular shape in whose base a water access (21) in provided by means of a threaded female socket. From this water access(21), through a conventional plumbing system that is located in the inner hollow of the rectangle, water is distributed until each one of the eight faucets/taps(22) that are distributed by four and four in the longitudinal faces of the mentioned supplier(2). Also provided in the longitudinal sides is a secondary joint means connected(23) with the sustaining legs(4) of the water supplier(2).

**[0020]** The fold-out legs(3) of the sustenance of the basin(1) are comprised of the retention crossbar(31) and positioning crossbar(32). The retention crossbar(31) turns over the joint(14) of the first joining means and has incorporated a second handrail(33) and a second bar (34). The positioning crossbar(32) turns on the joint(14') of the first joining means and has incorporated in the opposite end of the turning axis of the mentioned joint a drive pin(35), which slides on the slots(36) that are formed between the second handrail(33)and the second bar(34). The spreading out of the foldable legs(3)of the basin sustenance(1) is executed by letting them drop; contrary to this, two combined movements are needed for the mentioned legs to be folded which are done in the

following order: first, one has to slightly lift the lateral formed by the transversal profile(12) and second, by unhooking the drive pin(35) that will then run through the slots(36) allowing the retention crossbar(31) and the positioning crossbar(32) to turn until reaching a horizontal position. This way of folding is useful so that unwanted folding/bending is avoided, for example due to hits/bumps.

**[0021]** The sustaining legs(4) of the water supplier(2) turn on the second means of jointed unions(23) located in the water supplier(2) and incorporates a driving pin (41) in the opposite end of the joint that slides through by the slots that make up the first handrail(17) and the first bar(16) with the help of the sliding guides (15), which is made of plastic and avoids the grazing between metal parts.

**[0022]** As can be seen in Fig.8, in a column of piled-up washstands, with exception of the washstand located in the top, the occupied space at height level of each washstand is the same for all of them and inferior for the one occupying an already folded washstand. In the preferred embodiment of the invention this length is practically of 95mm for each unit so, connecting two european pallets(50) in a way that form a rectangle between the two, over which supporting the washstands and fitting in the washstand located in the lower part with several cubes(51) will enable the transport of up to 25 units, therefore provided with 200 faucets would occupy a height of approximately 2,5m in its transport or storage.

**[0023]** The material used in all the components, excluding the plumbing pipes, is of high quality stainless steel, which gives the equipment a good appearance that does not deteriorate as time passes.

**[0024]** Additionally, by means of a simple set-up, the washstand may be equipped with other useful devices like mirrors, towel-rails, soap dishes, etc. To do this, two support devices(60) are fastened onto the water supplier (2) over which a longitudinal platform for mirrors(61) preferably made of plastic is fitted into, which in a transversal section has a general "A" shape and that extends on each longitudinal side presenting two sides that have four mirrors(62) integrated on each side.

**[0025]** Each supporting device(60) has an open polygonal shape on the lower part, on which several claws(63) are provided that are set into the water supplier(2) and are secured by the lock(64) that pivots on an axis(65) and remains hooked by means of a latch(66). Once both supporting devices(60) are set in, only the mirror platform (61) is left to adjust, which is fitted in by pressing on the two supports(60).

**[0026]** In alternative embodiments of the actual invention, the dimensions and shapes can be changed, just as the manufacturing process and of course, the material used also can. And so, in these alternative embodiments, the fold-out stackable multiple washstand can be totally or partially made with materials that have sufficient toughness to be able to comply with all the characteristics of the preferred aforementioned embodiment. Taking into

account economic objectives of cost reduction, said materials could be of: mid-quality stainless steel, mixes of plastic and resins, high-density polyethylene HDPE or low density LDPE, polypropylenes, polyamides, ABS acrylics or PMMA, PCE polycarbonates, HIPS styrenes, and polyesters. Mentioned materials can be appropriately made by manufacturing processes based on: thermo-shaping, rotational moulding, manual laminating of open-moulding and injection.

**[0027]** It is evident that the invention herein described and accompanied by a preferred embodiment can be object to variations obvious to experts in the art as far as forms, dimensions and materials are concerned, which, must not be seen as a modification of the field of invention and of the claims that are listed as follows;

## Claims

1. Stackable, folding multiunit washstand of the portable type which comprises:
  - a basin or bucket (1)
  - a water supplier (2)
  - four foldable legs (3) for sustaining said basin (1); and
  - four foldable legs (4) for sustaining said water supplier (2),
 wherein the mounting of said stackable folding multiunit washstand is carried out by deployment of the whole assemblage without the need of using a tool, whereby a bundling of said washstands may be folded integrally for storage and transport thereof without using tools and may be stacked up to a height.
2. Stackable, folding multiunit washstand according to claim 1, wherein said basin or bucket (1) is formed by the union of two longitudinal profiles (11), two transversal profiles (12) and a plate body (13), whereby in said longitudinal profiles (11) are provided first union means in the shape of joints (14,14') with said sustaining legs (3) of said basin (1), furthermore being provided in the superior surface of said plate body (13), some attachment and interlocking means with said water supplier (2), wherein said attachment and interlocking means are comprised of a primer handrail (17), a sliding guide (15) and a primer bar(16), whereby furthermore in said basin or said bucket (1) some drainages (18) through which the residual water goes out, and a hole of the hose path(19) through which a hose that supplies the water to the water supplier(2) passes.
3. Stackable, folding multiunit washstand according to claim 1, wherein in said water supplier (2) a water access (21) is provided, which once connected to a conventional plumbing system distributes the water

into a bundling of faucets (22) located in the longitudinal faces of said water supplier (2), thereby providing in said longitudinal faces of said supplier (2) for second jointed union means (23) with said sustaining legs (4) of said water supplier (2).

4. Stackable, folding multiunit washstand according to claim 1, wherein said foldable sustaining legs (3) of the basin (1) are comprised of a retention crossbar (31) and a positioning crossbar(32), whereby said retention crossbar (31) turns over the said joint(14) of the first joining means, said retention crossbar (31) has incorporated a second handrail(33) and a second bar(34), said positioning crossbar(32) is able to turn on said joint(14') of the first joining means, and said positioning crossbar (32) has incorporated in its opposite end to said joint (14') of said joining means a drive pin(35) which slides on the slot(36) that is formed between said second handrail(33)and said second bar(34).
5. Stackable, folding multiunit washstand according to claim 1, wherein said sustaining legs (4) of said water supplier (2) turn over said second jointed union means (23) located in said water supplier (2), whereby each one of said sustaining legs (4) in the opposite end to said joint (23) shows a drive pin (41), which slides through a slot formed by said first the handrail (17) and said first bar (16), thereby causing said sliding with the help of said sliding guide (15), which avoids the grazing between metallic parts.
6. Stackable, folding multiunit washstand according to claim 1 wherein additionally, it is possible to assemble with the water supplier (2) some supporting elements (60), on which is coupled a longitudinal platform for the mounting of mirrors (61), which bears some mirrors (62) fitted thereon.
7. Stackable, folding multiunit washstand according to claim 1 wherein the usable materials are selected from high-quality stainless steel, mid-quality stainless steel, mixes of plastic and resins, high-density polyethylene HDPE or low density LDPE, polypropylenes, polyamides, ABS acrylics or PMMA, PCE polycarbonates, HIPS styrenes, and polyesters; and the manufacturing process for non-metallic materials is selected from; thermo-shaping, rotational moulding, manual laminating of open-moulding and injection.

#### Patentansprüche

1. Stapelbarer, aus mehreren Einheiten bestehender tragbarer Klappwaschtisch, enthaltend:
  - ein Bassin oder eine Wanne (1)

- einen Wasserspender (2)  
 - vier faltbare Beine (3) auf die sich besagte Wanne (1) stützt; und  
 - vier faltbare Beine (4) auf die sich besagter Wasserspender (2) stützt, **dadurch gekennzeichnet dass** die Montage des besagten faltbaren aus mehreren Einheiten bestehenden Waschbeckens mittels vollständiger Entfaltung des Waschtisches ohne der Notwendigkeit der Anwendung eines Werkzeugs durchgeführt wird, hingegen eine Bündelung besagter Waschbecken zu Lagerung und Transport ohne dazu Werkzeuge zu verwenden integral zusammengefasst und bis zu einer Höhe gestapelt werden kann.

2. Stapelbarer aus mehreren Einheiten bestehender tragbarer Klappwaschtisch nach Anspruch 1, **dadurch gekennzeichnet dass** besagtes Waschbecken oder Wanne (1) durch Verbindung von zwei Längsprofilen (11), zwei Querprofilen (12) und einen Tellerkörper (13) gebildet wird, wobei in besagten Längsprofilen erste gelenkförmige Verbindungselemente (14,14') mit besagten Füßen (3) besagter Wanne (1) vorgesehen sind, weiterhin bestückt in der Oberseite besagten Tellerkörpers (13) mit einigen Haft- und Verriegelungsmitteln, wobei besagte Haft- und Verriegelungsmittel aus einer ersten aHandführung (17), einer Schiebeführung (15) und einem ersten Stab (16), bestehen wobei weiterhin in besagtem Becken oder Wanne (1) einige Bohrungen angebracht sind durch welche das Restwasser hindurchläuft, und ein Loch der Schlauchführung (19), durch den ein Schlauch, der den Wasserversorger (2) mit Wasser versorgt, übergeht.
3. Stapelbarer aus mehreren Einheiten bestehender tragbarer Klappwaschtisch nach Anspruch 1, **dadurch gekennzeichnet dass** in besagtem Wasserspender (2) eine Wasserzuführung (21) vorgesehen ist, die einmal an einer konventionellen Rohrleitung angeschlossen, das Wasser zu einer Anzahl Wasserhähne (22) hin verteilt, die sich in beiden Längsseiten des besagten Wasserspenders (2) befinden, wobei in diesen Längsseiten zweite gelenkartige Verbindungselemente (23) mit den besagten Stützbeinen (4) besagten Wasserversorgers (2) versehen sind.
4. Stapelbarer aus mehreren Einheiten bestehender tragbarer Klappwaschtisch nach Anspruch 1, **dadurch gekennzeichnet dass** die faltbaren Beine (3) des Beckens (1) aus einem Längsträger (31) und einer Fixierstange (32) bestehen, wobei besagter Längsträger(31) über besagtes Gelenk von genannten ersten Verbindungsmitteln drehbar ist, besagter Längsträger (31) eine zweite Handführung (33), ein zweiter Stab (34), wobei besagte Fixierstange (32)

um besagtes Gelenk (14') besagten Verbindungsmitteln drehbar ist, und besagte Fixierstange (32) an ihrem besagtem Gelenk (14') dieser ersten Verbindungsmittel entgegengesetzten Ende über ein Bolzen (36) der durch eine zwischen besagter zweiter Handführung (33) und besagtem zweiten Stab (34) gebildete Rille hindurchschlüpft.

5. Stapelbarer aus mehreren Einheiten bestehender tragbarer Klappwaschtisch nach Anspruch 1, **dadurch charakterisiert dass** besagte Haltebeine (4) des besagten Wasserversorgers (2) um besagte zweiten gelenkartigen Verbindungsmittel (23) drehbar sind, wobei jede einzelne dieser Haltebeine (4) an dem besagtem Gelenk (23) gegenüberliegenden Ende einen Zapfen (41) aufweist, der sich durch einen aus besagter ersten Handführung (17) und besagter ersten Stange (16) geformten Schlitz schieben lässt, wobei diese Verschiebung mit Hilfe besagter Gleitführung (15) geschieht, wodurch die Reibung zwischen beiden metallischen Teilen verhindert wird.
6. Stapelbarer aus mehreren Einheiten bestehender tragbarer Klappwaschtisch nach Anspruch 1, **dadurch charakterisiert, dass** es zusätzlich möglich ist, einige Stützelemente (60) mit dem Wasserversorger (2) zusammenzubauen, auf die eine längliche Montageplatte (61) einrastet, welche eingebaute Spiegel trägt.
7. Stapelbarer aus mehreren Einheiten bestehender tragbarer Klappwaschtisch nach Anspruch 1, **dadurch charakterisiert, dass** die Nutzmaterialien aus hochwertigem Edelstahl, mittelwertigem Edelstahl, Mischungen aus Kunststoffen- und Harzen, Polyethylene hoher Dichte (HDPE) oder niedriger Dichte (LDPE), Polypropylene, Polyamide ABS- oder PMMA-Acryle, PCE-Polycarbonate. HIPS Styrole und Polyestern ausgewählt werden, und der Herstellungsprozess für nichtmetallische Werkstoffe aus Thermo-Shaping, Rotationsformen, Open-Handlaminierverfahren und Spritzguss ausgewählt wird.

## Revendications

1. Lavabo multiple dépliant et empilable de type portable, comprenant:
  - Un bassin ou un seau (1)
  - Un fournisseur d'eau (2)
  - Quatre jambes pliables (3) de soutien du dit bassin (1), et
  - Quatre jambes pliables (4) de soutien dudit fournisseur d'eau (2),**caractérisé en ce que** le montage dudit lavabo

multiple dépliant et empilable est effectuée par le déploiement de tout l'ensemble sans qu'il soit nécessaire d'utiliser un outil, peuvent être pliés intégralement sans utiliser d'outils, pour leur stockage et leur transport, et plusieurs de ces lavabos pouvant être empilés jusqu'à une hauteur.

2. Lavabo multiple dépliant et empilable de type portable, selon la revendication 1, **caractérisé en ce que** ledit bassin ou seau (1) est formé par l'union de deux profils longitudinaux (11), deux profils transversaux (12) et un corps de plaque (13), en fournissant dans ces profils longitudinaux (11) des premiers moyens de liaison en forme de joint (14, 14') avec lesdites jambes (3) de soutien dudit seau (1), en ayant prévu par ailleurs dans la surface supérieure dudit corps de plaque (13) quelques attachements et des moyens de verrouillage avec ledit fournisseur d'eau (2), lesdites moyens de raccordement et de verrouillage étant constituées par un premier main-courante (17), un guide de coulissement (15) et une première barre (16), en ayant prévue en outre dans ledit bassin ou seau (1) certains drainages (18) à travers lesquelles sort l'eau résiduelle sort, et un trou de passage de tuyau (19) à travers lequel passe un tuyau qui fournit l'eau au fournisseur d'eau (2).
3. Lavabo multiple dépliant et empilable de type portable selon la revendication 1, **caractérisé en ce que** dans dit fournisseur d'eau (2) un accès à l'eau (21) est fourni, qui, une fois relié à un système de plomberie, distribue l'eau dans un groupement de robinets (22) situés dans les côtes longitudinales dudit fournisseur d'eau (2), en fournissant à ces faces longitudinales des seconds moyens de liaison articulée (23) avec lesdites jambes (4) de soutien dudit fournisseur d'eau (2).
4. Lavabo multiple dépliant et empilable de type portable selon la revendication 1, **caractérisé en ce que** lesdites jambes (3) de soutien du bassin (1) sont constituées d'une barre de rétention (31) et une barre transversale de positionnement (32), ladite barre de rétention (31) tournant sur ladite joint (14) des premiers moyens de liaison, ladite barre de rétention (31) comprenant une deuxième main courante (33) et une deuxième tige (34), ladite barre de positionnement (32) étant capable de tourner sur ledit joint (14') des premiers moyens de liaison, et dit barre de positionnement (32) a intégrée dans son extrémité opposée à ladite joint (14') desdites premiers moyens de liaison, une goupille (35) qui coulisse dans une fente (36) qui est formée entre ladite deuxième main courante (33) et ladite deuxième barre (34).
5. Lavabo multiple dépliant et empilable de type portable

selon la revendication 1, **caractérisé en ce que** les-  
dites jambes (4) de soutien du bassin dudit fournis-  
seur d'eau (2) tournent sur lesdits deuxièmes  
moyens de liaison articulée (23) situés dans ledit  
fournisseur d'eau (2), dans lesquels chacune des 5  
jambes (4) de soutien montre dans l'extrémité op-  
posée à ladite liaison articulée (23) une goupille (41)  
qui se glisse dans une fente formée par ladite pre-  
mière main courante (17) et ladite première barre  
(16), ledit coulisement se produisant avec l'aide de 10  
ladite guide coulissante (15), ce qui évite le frotte-  
ment entre les pièces métalliques.

6. Lavabo multiple dépliant et empilable de type portatif  
selon la revendication 1, **caractérisé en ce que** en 15  
outre, il est possible d'assembler avec le fournisseur  
d'eau (2) certains éléments de support (60), sur les-  
quels il est couplé une plate-forme longitudinale pour  
le montage de miroirs (61), qui porte des miroirs (62)  
encastrés. 20

7. Lavabo multiple dépliant et empilable de type portatif  
selon la revendication 1, **caractérisé en ce que** les  
matériaux utilisables sont choisis à partir d'acier  
inoxydable de haute qualité, acier inoxydable de 25  
qualité moyenne, des mélanges de plastiques et de  
résines, PEHD polyéthylène haute densité ou PEBD  
faible densité, les polypropylènes, polyamides ,  
acryliques ABS ou PMMA, PCE polycarbonates, des 30  
styrènes HIPS, et des polyesters, et le processus de  
fabrication pour les matériaux non-métalliques est  
sélectionné parmi le thermo-formage, le moulage  
par rotation, mode de stratification ouverte et de  
moulage d'injection. 35

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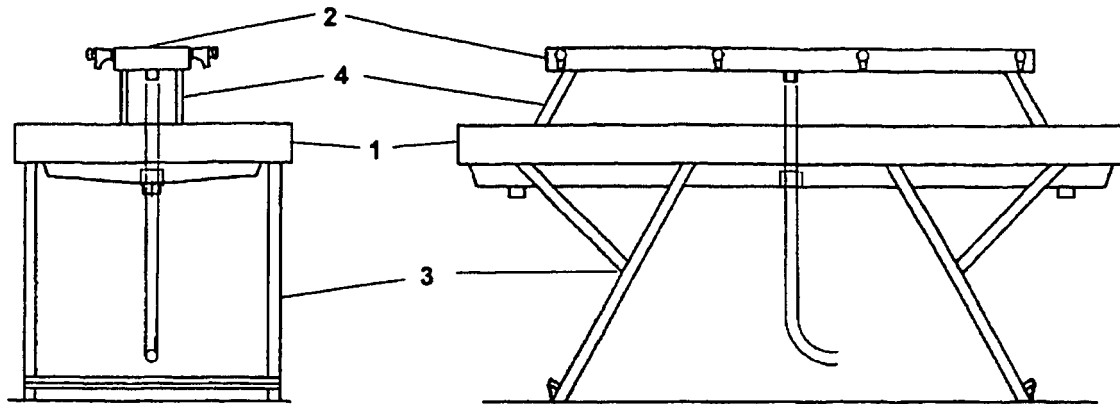


FIG. 1

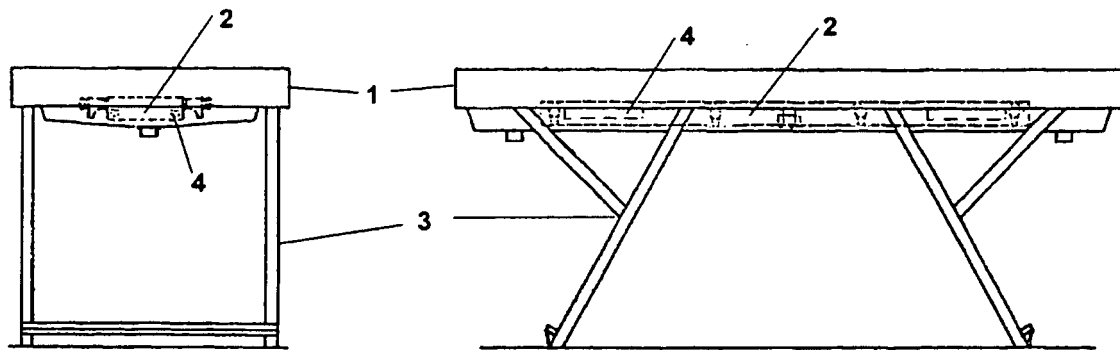


FIG. 2

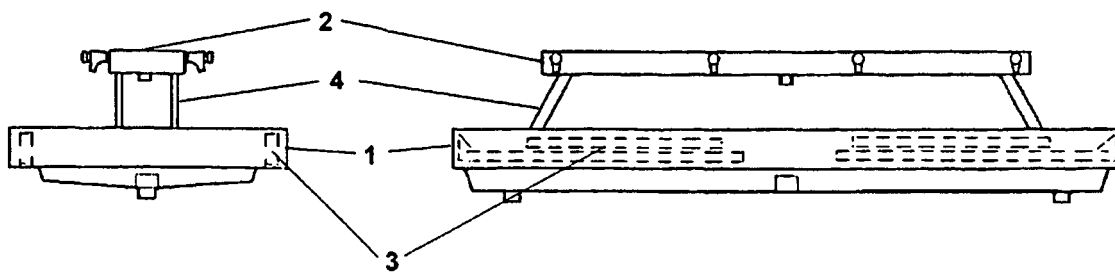


FIG. 3

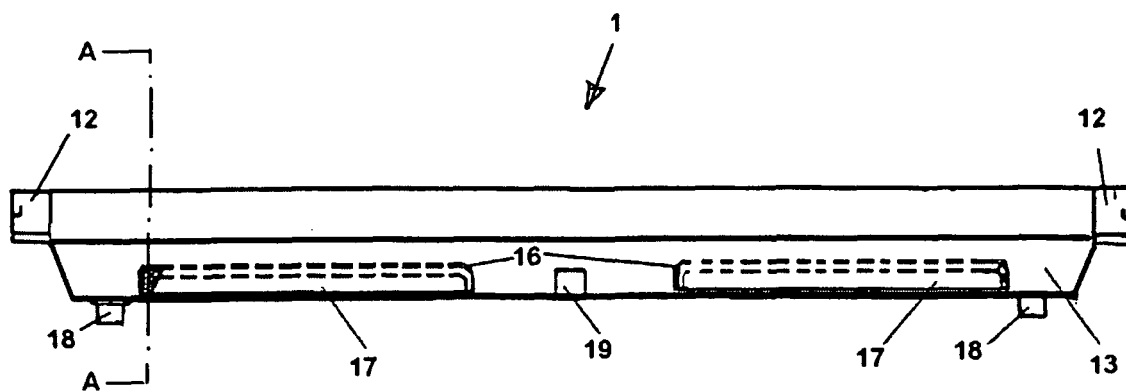


FIG. 4

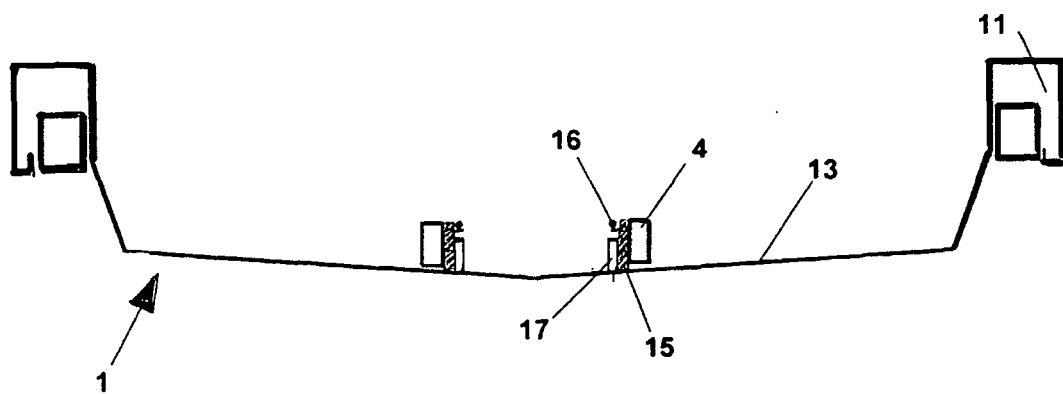


FIG. 5

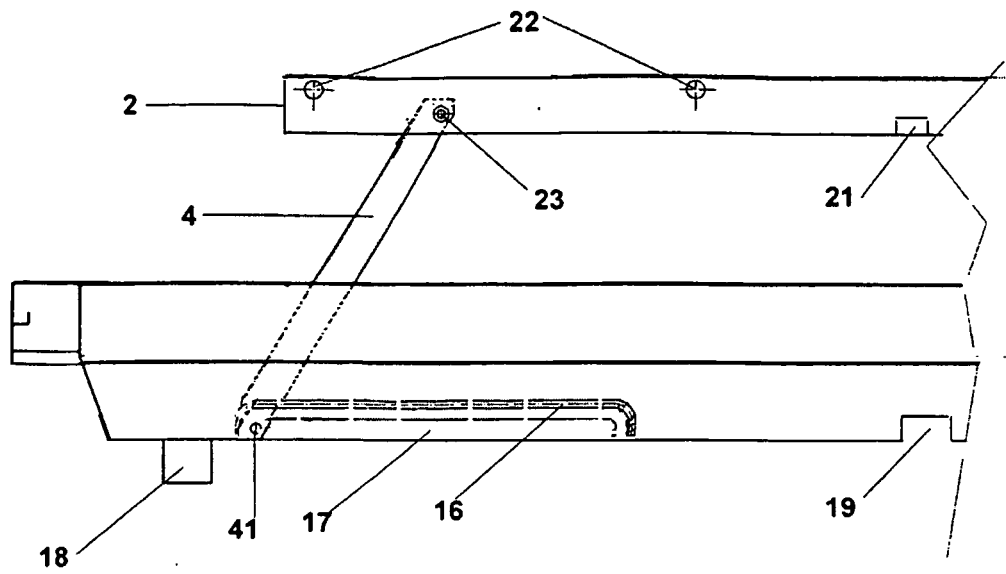


FIG. 6

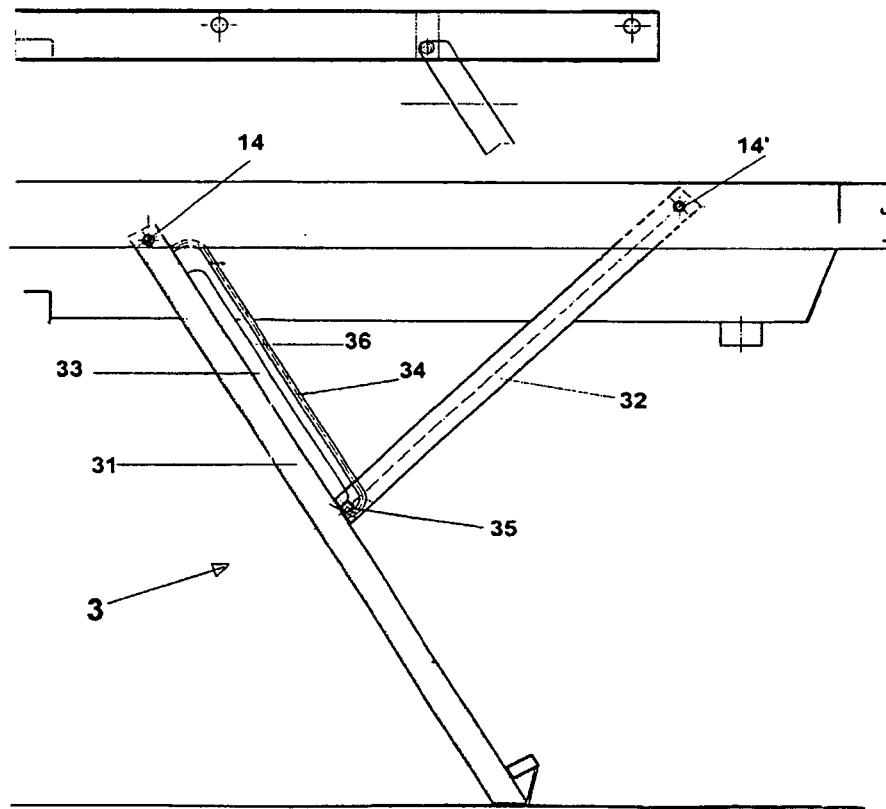


FIG. 7

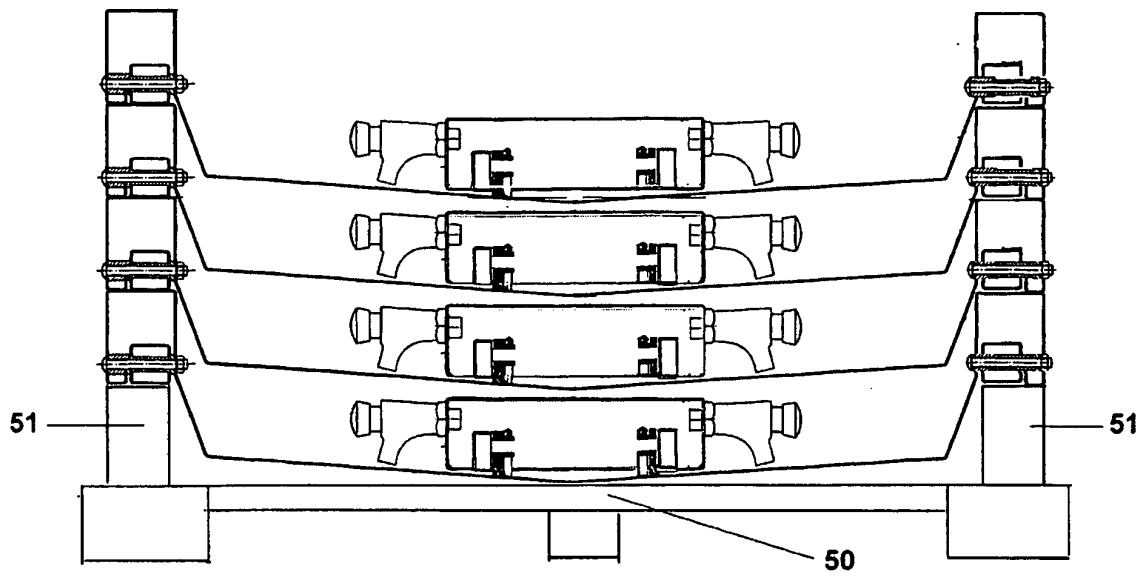


FIG. 8

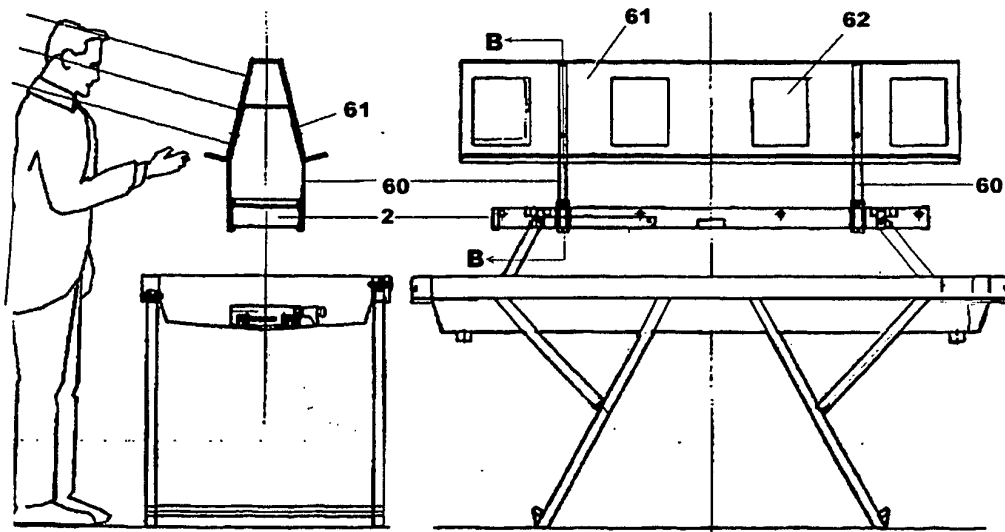


FIG. 9

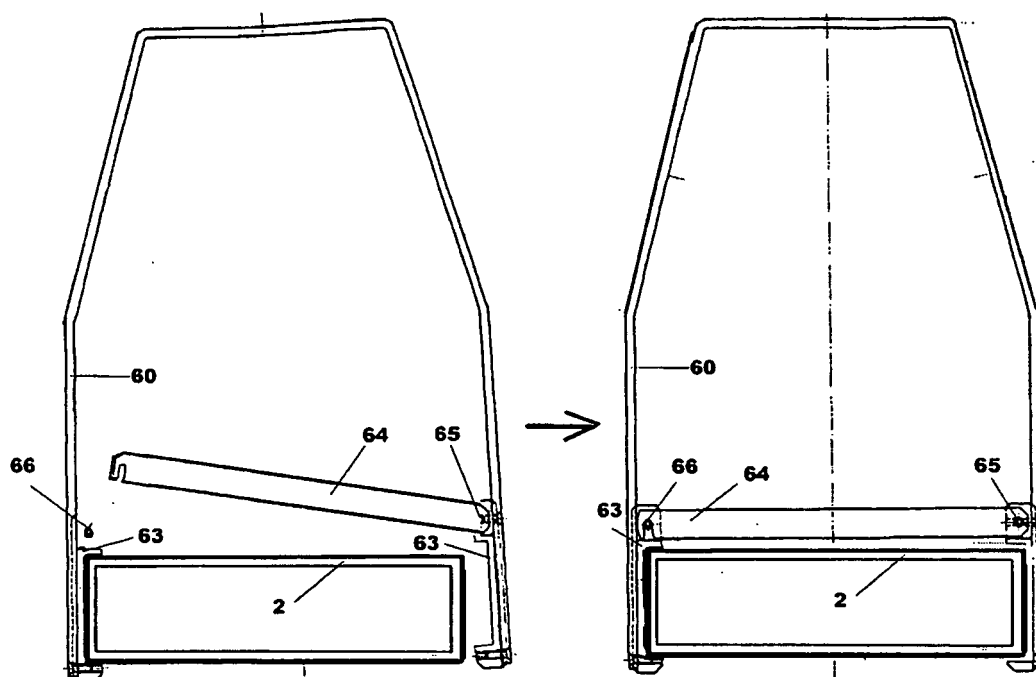


FIG. 10

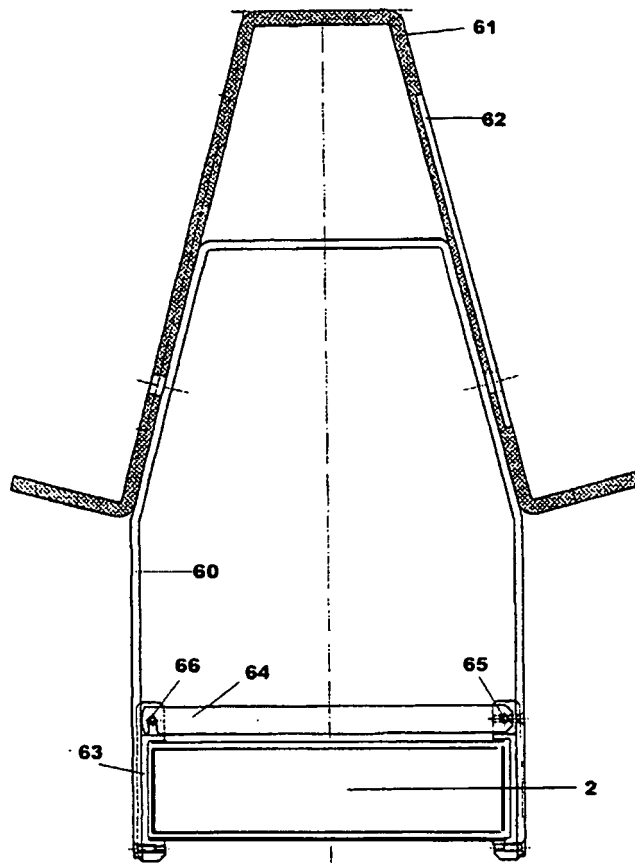


FIG. 11

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

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