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(54) **WORK BENCH**

WERKBANK

TABLE DE TRAVAIL

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(56) References cited:
CN-A- 102 019 613
CN-U- 203 266 622
CN-Y- 2 383 412
US-A1- 2002 179 181
US-A1- 2008 245 441
US-A1- 2011 232 805
US-A1- 2011 232 805

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Description

OBJECT OF THE INVENTION

[0001] The invention, as it appears in the title of this specification, refers to a worktable, which presents a series of novelty advantages and characteristics, that will be described in detail below, that mean a significant innovation in the current state of the art.

[0002] This invention consists therefore in a worktable specially applicable to facilitate cutting large-sized porcelain articles without discarding other types of materials, being for that aim structurally designed with different boards in hinged connection to a basic board, which are arranged supported on cushioning elements accompanying all the time the segment of the piece to be cut, avoiding undesirable breakages.

FIELD OF APPLICATION OF THE INVENTION

[0003] The field of application of this invention is within the sector of the industry engaged in manufacturing worktables, in particular focused in the area of the tables for cutting flat pieces to work with large-sized porcelain materials or the like

BACKGROUND OF THE INVENTION

[0004] As it is known, the flat pieces of porcelain material as well as also others of other materials such as glass, ceramic, or others, use to be cut with a cutting tool that produces a mark or notch on the surface of the piece and thereafter slightly hitting or pressing the segment to be cut, normally placing it on the edge of the worktable to eventually breaking the piece just by the line that has been marked by the cutting machine.

[0005] However, this operation, specially when it is dealt with large-sized pieces, for example of 3000 x 1500 cm, is a very delicate and risky operation, because if the break of the segment does not occur accurately on the marked line, the full piece may be damaged and anyway, risks could be run that the segment to be cut is broken when hitting it or when it falls down with the subsequent economic cost for waste of material and the subsequent risk of injuries for the user.

[0006] The objective of this invention therefore is to develop a worktable that allows to facilitate the described operation and make sure to achieve a perfect cut of the pieces just by the notch the tool will mark, in every and each case, avoiding any suffering of the segments cut, by means of a system of cushioned movable boards that accompany the said segments all the time.

[0007] US2011232805 discloses a carpentry work station that comprises several boards that can be lowered in order to redefine the working surface, mainly so it can be transported and stored in a folded position.

[0008] As reference to the current state of the art, it shall be pointed out that, although different models and types of worktables are known in the market, applicable to different uses, some of them designed like the one herein to cut pieces, at least this applicant is not aware of any showing technical and structural characteristics similar to those shown by the table of the invention.

DESCRIPTION OF THE INVENTION

[0009] The table proposed by the invention, is therefore configured as a significant novelty, within its field of application, because by implementing it, the above mentioned objectives are satisfactorily achieved, the characterizing details making it possible and distinguishing it from the already known are conveniently appearing in the final claims attached to this specification.

[0010] What the invention proposes is a worktable the essential aim of which is to provide an easy and safe system for cutting pieces of porcelain or of other similar materials, in particular in order that, after the cutting machine produces the notch marking the breaking line, to procure accompaniment to the segment to be cut supported all the time and throughout it on a cushioned supporting surface while pressure is applied on it to achieve the material breaking exactly by the said line.

[0011] For this, the worktable of the invention is essentially configured from a base board supported on fixed legs, that can preferably be height-regulable to situate the table at the required height and a series of supporting boards , at least one joined coplanar to the base board in a hinged and cushioned way, so that, when pressure is applied on them, they have the capability to be downwards folded to a certain extent, tending to return to their horizontal position thanks to the said cushioning means.

[0012] Thus, the said supporting boards are used to place the pieces with the cutting line on their point of hinged connection to the base board and with the part of the segment to be split or broken arranged on them, while the rest of the piece rests on the base board. And when the piece is placed in the said position, a pressure can be exercised on the part of the segment to be cut being assured that the said pressure is correctly distributed as the full piece is supported on a surface accompanying the segment.

[0013] It shall be pointed out that, although one or several supporting boards can be coupled to the base board, in different options, in a preferred embodiment of the invention, a first supporting board is coupled to the base board on one of its sides, a second supporting board in another of its sides, concretely on the side adjacent to the one being coupled to the first supporting board, and a third supporting board that, instead of being coupled to the base board, is coupled between the first and the second supporting boards, the said hinged connection being selectively with one or the other, by incorporating a link rod linking them to each other, providing thus the possibility to extend the surface of the table that constitutes a fixed board or a moving board and thus adapting it to the different needs.

[0014] On their hand, the cushioning means providing that the accompaniment of the supporting boards and their return to their initial position, in the preferred embodiment of the invention, are formed by spring-loaded legs, which in addition are provided with fastening means to avoid or not, as required, their use as a cushioning element. Thus, the said legs are incorporated, at least, one under the different supporting boards and, depending whether they have to be used or not, they are left unfastened in order that the spring they incorporate acts or they are fastened in order they do not act and serve as fixed legs.

[0015] According to another significant characteristic of the invention, the supporting boards are coupled quickly and easy removable to the rims of the base board of the table, by using tongue and groove connecting hinges, so that the full assembly can be easily coupled and allows a way for dismounting the table for its transport and transfer, the legs being also preferably dismountable, as well those fixed of the base board as those cushioned of the supporting boards.

[0016] In a variant of embodiment, the boards can be replaced by a series of strips in a parallel arrangement offering as a whole a surface on which the material to be cut is supported.

[0017] Last, and in an already known way, the surface shows one or several lengthwise and/or crosswise slots to insert buffer stops to position the pieces or the cutting machine.

[0018] Therefore, the main advantages the table of the invention provides are:

- The horizontal folding system of the supporting boards to facilitate cutting the large-sized porcelain pieces that make a virtually perfect 90-degree cut, as the segment to be cut never lacks the support of the table.

- The cushioned legs to facilitate folding the supporting boards that tends to return to their position after they have been used.

- The multiple assistances to the work such as the slots for the locking toes for the ceramic piece, the supporting boards being converted into extensions of the fixed base board on its sides to allow different positions of the large-sized piece etc.

- The sizes of each of the boards to be used in different combinations. As well lengthwise as crosswise.

- The handling of the table, fully dismountable in a few seconds to facilitate its transport to any work place.

- The support for the cutting machine of different brands existing in the market, to facilitate the work when cutting- separating the material.

[0019] The disclosed worktable consists, therefore, of an innovating structure having characteristics unknown up to date for the purpose to which it is designed, reasons that, jointly with its practical utility, provide it with sufficient ground to obtain the privilege of exclusivity applied for.

DESCRIPTION OF THE DRAWINGS

[0020] To complement the description that is being carried out and in order to assist to best understand the characteristics of the invention, a set of drawings is attached to this specification as an integral part thereof in which, with illustration and not limiting purpose, the following has been represented:

Figure number 1.- It shows a top plan view of an example of embodiment of the worktable, object of the invention, and the arrangement of the different boards that it includes being apparent;

Figures number 2 and 3. - They show each, top plan and side elevation views, respectively, of the base board with fixed legs pertaining to the table, according to the invention;

Figures number 4 and 5.- They show each, top plan and side profile views, respectively, of a first supporting board pertaining to the table, according to the example of the figure 1;

Figure number 6.- They shows a side elevation view of the first supporting board appearing in Figures 4 and 5, represented in this case with the cushioned leg incorporated at its lower part;

Figures number 7, 8 and 9.- They show each, in side profile, the top plan and side elevation views, respectively, of a second supporting board pertaining to the table of the invention, according to the example of the figure 1, the figure 9 showing the elevation view of two cushioned legs it incorporates;

Figures number 10, 11 and 12.- They newly show each, the top plan, side profile and side elevation views, respectively, of the third supporting board pertaining to the table of the invention, according to the example of the figure 1, the figure 12 showing the elevation view of the cushioned leg it incorporates;

Figure number 13. - It shows a section view of one of the cushioned legs of the invention, according to the example represented in the figure 1;

Figure number 14.- It shows an elevation view of an example of buffer stop to fasten the position of the plates and the tool serving to fasten it in the slots of the table provided to that effect;

Figure number 15.- It shows an elevation view of a rod serving to lock in order to join to each other the second and third supporting boards of the table, according to the example of the figure 1; and

Figures number 16, 17, 18 and 19. - They show different plan and elevation views, of the female and male parts of the hinges joining the supporting boards to the base board of the table, according to the example of the figure 1. Concretely the figure 16 and the figure 18, respectively, show the plan and elevation views of the female part of the hinge, and the Figures 17 and 19, respectively, the plan and elevation views of the male part.

PREFERRED EMBODIMENT OF THE INVENTION

[0021] At the sight of the said figures, and according to the numbering adopted, an example of a preferred but not limiting embodiment can be seen in them, of the worktable of the invention, which comprises the parts and elements that are indicated and described in detail thereafter.

[0022] Thus, as it can be seen in the figure 1, the table (1) in question, is essentially configured by a base board (2) having a rectangular plan supported on fixed legs (3), preferably four legs, or that can be height-regulable, to which in an innovating way is coupled, at least, a first supporting board (4) that is joined laterally to one of the sides of the said base board (2) hinged and cushioned, that means, so that it has the capability to be downwards folded to a certain extent, when applying pressure on the said supporting board (4) tending to return to its horizontal position and coplanar to the base board (2) when such pressure is no longer exercised, for which an hinged connection through hinges (5, 6) and cushioning means (7) is contemplated.

[0023] Preferably, in addition, a second supporting board (4') is coupled to the base board (2) in another of its sides, concretely in the side adjacent to that the first supporting board (4) is coupled, in both cases with the same hinged connection system and cushioned by means of hinges (5, 6) and cushioning means (7), and there also exists a third supporting board (4") that is coupled to the first and to the second supporting boards (4, 4') also by means of hinges (5, 6) and cushioning means, but including a linking part (8) that, preferably consisting of a rod, allows its hinging or movement in conjunction with one or the other, selectively.

[0024] Thus, such link rod (8), visible in the figure 15 and designed to be inserted in holes (9) provided to that effect in coinciding points of the rims of the structure of the supporting boards that remain facing each other, as it can be seen in the Figures 7 and 11, allows, depending if it is placed between the first supporting board (4) and the third supporting board (4"), or between the second supporting board (4') and the third supporting board (4"), to extend the surface of the supporting board that is hinged with the base board (2) and with the other supporting board, on one side or the other thereof as required.

[0025] In the figure 1 the full table of the said preferred option of embodiment can be seen, with the base board (2) and the three supporting boards (4, 4', 4"), the points of hinged connection where the folds of the said supporting boards are produced been represented by means of a dashed line and their downwards tilting, by means of arrows, the two possibilities it offers been shown as well by one side as by the other, that means, as well lengthwise as crosswise, as required.

[0026] And in the Figures 2 to 12, the different base (2) and supporting (4, 4' 4") boards can be seen, in different views to allow to appreciate all their characteristics.

[0027] As represented in Figures 6, 9, 12 and 13, the cushioning means (7) that determine the supporting boards (4, 4', 4") tending to return to their horizontal position, coplanar to the base board (2), preferably consist of cushioned legs that, formed by two independent stretches (10) house a spring (11) within them, fastened to a support (12) which, in addition, are provided with fastening means (13) to avoid the movement of the said spring (11), for example a pin (13) that locks both stretches (10) of the leg.

[0028] On their hand, the hinges (5, 6) that join in an hinged connection the supporting boards (4, 4' 4") to each other and to the base board (2) are preferably easily dismountable, and of tongue and groove coupling type, comprising, as shown in Figures 16 to 19, female pieces (5) formed by a flatbar with drilled holes (14), in order it is screwed on the board structure, and a window-shaped hollow (15) (figures 16 and 18), and male pieces (6) formed by another flatbar with drilled holes (14), for screwing it, and a hook-like curved protrusion (16), adapted to be imbedded in the window (15) of the female pieces (5) (figures 17 and 19), so that the said coupling and its dismounting result easy and quick.

[0029] Last, the surface of the base board (2) and of the supporting boards (4, 4', 4"), that is covered with a soft material, of rubber type or the like, has one or several slots (17) running crosswise and/or lengthwise from one end to another end thereof been, if applicable; coincident in position between one and other boards, which are designed to insert buffer stops (18) that, fixed by means of a suitable tightening tool (19), serve to position the pieces to be cut on the table and avoid any undesirable displacement thereof.

[0030] The nature of this invention being sufficiently described, as well as the way of implementing it , it is not deemed necessary to extend any longer the explanation in order that any person skilled in the art understands its scope and the advantages arising from it.

Claims

1. Worktable that, specially applicable to facilitate cut-

ting pieces of porcelain or other materials, and configured by a base board (2) of rectangular plan that is supported on fixed legs (3) or height-regulable legs, where at least, a first supporting board (4) is coupled to that base board (2) that is laterally hinged to one of its sides with capability to be downwards folded is **characterized in that** the hinged connection of the supporting board (4) with respect to the base board (2) has cushioning means (7) that allow that the supporting board (4) returns to its horizontal position and coplanar to the base board (2) when pressure is no longer exercised.

2. Worktable, according to the claim 1, **characterized in that,** in addition, a second supporting board (4') is coupled to the base board (2) in another of its sides, also by means of hinges (5, 6) and cushioning means (7).

3. Worktable, according to claim 2, **characterized in that** the second supporting board (4') is coupled to the base board (2) in the lateral side adjacent to which the first supporting board (4) is coupled and a third supporting board (4") appears that is coupled to the first and the second supporting boards (4, 4') also by means of hinges (5, 6) and cushioning means (7) and includes a linking part (8) that allows its hinging or movement in conjunction with one or the other, selectively.

4. Worktable, according to claim 3, **characterized in that** the linking part (8) is a rod adapted to be inserted in holes (9) provided to that effect in coinciding points of the rims of the structure of the supporting boards that remain facing each other

5. Worktable, according to any of claims 1 to 4, **characterized in that** the cushioning means (7) consist of cushioned legs housing a spring (11).

6. Worktable, according to claim 5, **characterized in that** the legs comprise two independent stretches (10) housing within them the spring (11) fastened on a support (12).

7. Worktable, according to any of the claims 5 or 6, **characterized in that** the cushioned legs have fastening means (13) to avoid the movement of the spring (11).

8. Worktable, according to any of the claims 1 to 5, **characterized in that** the hinges (5, 6) are dismountable.

9. Worktable, according to claim 8, **characterized in that** the hinges (5, 6) are of the tongue and groove coupling type.

10. Worktable, according to claim 9, **characterized in that** the hinges (5, 6) comprise female pieces (5) formed by a flatbar with drilled holes (14), to screw it on the board structure, and a window-shaped hollow (15) and male pieces (6) formed by another flatbar with drilled holes (14), for screwing it, and a hook-like curved protrusion (16), adapted to be imbedded in the window (15) of the female pieces (5)

11. Worktable, according to claim 3, **characterized in that** the surface of the base board (2) and of the supporting boards (4, 4', 4") have slots (17) running crosswise and/or lengthwise from one to another of its ends, designed to insert buffer stops (18) to position the pieces to be cut.

12. Worktable, according to any of claims 1 to 11, **characterized in that** the base board (2) is composed by a series of strips in a parallel arrangement

Patentansprüche

1. Arbeitstisch, der besonders anwendbar ist, um das Schneiden von Porzellan oder anderen Materialien zu ermöglichen, und der aus einer Grundplatte (2) mit rechteckigem Grundriss besteht, die auf festen Beinen (3) oder höhenregulierbaren Beinen gestützt wird, wobei mindestens eine erste Stützplatte (4) mit der Grundplatte (2) gekoppelt ist, die lateral an einer ihrer Seiten angelenkt und nach unten klappbar ist, **dadurch gekennzeichnet, dass** die Scharnierverbindung der Stützplatte (4) in Bezug auf die Grundplatte (2) Polstermittel (7) aufweist, die ermöglichen, dass die Stützplatte (4) in ihre horizontale Position zurückkehrt und zur Grundplatte (2) koplanar ist, wenn kein Druck mehr ausgeübt wird.

2. Arbeitstisch nach Anspruch 1, **dadurch gekennzeichnet, dass,** außerdem an einer anderen seiner Seiten eine zweite Stützplatte (4') mit der Grundplatte (2), ebenfalls über Scharniere (5, 6) und Polstermittel (7) gekoppelt ist.

3. Arbeitstisch nach Anspruch 2, **dadurch gekennzeichnet, dass** die zweite Stützplatte (4') mit der Grundplatte (2) in der lateralen Seite gekoppelt ist, benachbart zu der die erste Stützplatte (4) gekoppelt ist, und eine dritte Stützplatte (4") erscheint, die mit der ersten und der zweiten Stützplatte (4, 4') ebenfalls mittels Scharnieren (5, 6) und Dämpfungsmitteln (7) gekoppelt ist und ein Verbindungsteil (8) einschließt, das wahlweise ihre Anlenkung oder Bewegung in Verbindung mit dem einen oder dem anderen ermöglicht.

4. Arbeitstisch nach Anspruch 3, **dadurch gekennzeichnet, dass** das Verbindungsteil (8) eine Stange

ist, die ausgelegt ist, in Löcher (9) eingesetzt zu werden, die zu diesem Zweck an zusammenfallenden Punkten der Ränder der Struktur der Stützplatte bereitgestellt sind, die einander zugewandt bleiben.

5. Arbeitstisch nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** die Dämpfungsmittel (7) aus gepolsterten Beinen bestehen, die eine Feder (11) aufnehmen.

6. Arbeitstisch nach Anspruch 5, **dadurch gekennzeichnet, dass** die Beine zwei unabhängige Stränge (10) umfassen, in denen die Feder (11) aufgenommen ist, die an einer Stütze (12) befestigt ist.

7. Arbeitstisch nach einem der Ansprüche 5 oder 6, **dadurch gekennzeichnet, dass** die gepolsterten Beine Befestigungsmittel (13) aufweisen, um die Bewegung der Feder (11) zu vermeiden.

8. Arbeitstisch nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** die Scharniere (5, 6) zerlegbar sind.

9. Arbeitstisch nach Anspruch 8, **dadurch gekennzeichnet, dass** die Scharniere (5, 6) vom Nut-Feder-Verbindungstyp sind.

10. Arbeitstisch nach Anspruch 9, **dadurch gekennzeichnet, dass** die Scharniere (5, 6) nach Innengewindestücke (5), die durch einen Flachstab mit Bohrlöchern (14) gebildet sind, um ihn an eine Plattenstruktur zu schrauben, und eine fensterförmige Mulde (15) und Außengewindestücke (6), die durch einen weiteren Flachstab mit Bohrlöchern (14) gebildet sind, um ihn anzuschrauben, und einen hakenartig gekrümmten Vorsprung (16) umfassen, der ausgelegt ist, um in das Fenster (15) der Innengewindestücke (5) eingebettet zu werden.

11. Arbeitstisch nach Anspruch 3, **dadurch gekennzeichnet, dass** die Oberfläche der Grundplatte (2) und der Stützplatten (4, 4', 4") Schlitze (17) aufweisen, die von einem zu einem anderen ihrer Enden quer und/oder längs verlaufen und konzipiert sind, um Anschlagpuffer (18) einzusetzen, um die zu schneidenden Stücke zu positionieren.

12. Arbeitstisch nach einem der Ansprüche 1 bis 11, **dadurch gekennzeichnet, dass** die Grundplatte (2) aus einer Reihe von Streifen in einer parallelen Anordnung zusammengesetzt ist.

Revendications

1. Établi, spécialement applicable pour faciliter une découpe de pièces en porcelaine ou autres matériaux, et configuré par une plaque de base (2) de plan rectangulaire qui est supportée sur des jambes fixes (3) ou des jambes réglables en hauteur, où au moins, une première plaque de support (4) est couplée à la plaque de base (2) qui est latéralement articulée à l'un de ses côtés ayant la capacité d'être pliée vers le bas est **caractérisé en ce que** la connexion articulée de la plaque de support (4) par rapport à la plaque de base (2) a des moyens d'amortissement (7) qui permettent à la plaque de support (4) de revenir dans sa position horizontale et coplanaire contre la plaque de base (2) lorsqu'une pression n'est plus exercée.

2. Établi, selon la revendication 1, **caractérisé en ce que,** en outre, une deuxième plaque de support (4') est couplée à la plaque de base (2) sur un autre de ses côtés, également au moyen d'articulations (5, 6) et de moyens d'amortissement (7).

3. Établi, selon la revendication 2, **caractérisé en ce que** la deuxième plaque de support (4') est couplée à la plaque de base (2) sur le côté latéral adjacent auquel la première plaque de support (4) est couplée et une troisième plaque de support (4") apparaît qui est couplée à la première et à la deuxième plaques de support (4, 4') également au moyen d'articulations (5, 6) et de moyens d'amortissement (7) et inclut une partie de liaison (8) qui permet son articulation ou mouvement en conjonction avec l'un ou l'autre, sélectivement.

4. Établi, selon la revendication 3, **caractérisé en ce que** la partie de liaison (8) est une tige adaptée pour être insérée dans des trous (9) prévus à cet effet à des points qui coïncident avec les rebords de la structure des plaques de support qui continuent de se faire face.

5. Établi, selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** les moyens d'amortissement (7) sont constitués de jambes amorties abritant un ressort (11).

6. Établi, selon la revendication 5, **caractérisé en ce que** les jambes comprennent deux portions indépendantes (10) abritant à l'intérieur de celles-ci le ressort (11) serré sur un support (12).

7. Établi, selon l'une quelconque des revendications 5 ou 6, **caractérisé en ce que** les jambes amorties ont des moyens de serrage (13) pour empêcher le mouvement du ressort (11).

8. Établi, selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** les articulations (5, 6) sont démontables.

9. Établi, selon la revendication 8, **caractérisé en ce que** les articulations (5, 6) sont du type à couplage par languette et rainure.

10. Établi, selon la revendication 9, **caractérisé en ce que** les articulations (5, 6) comprennent des pièces femelles (5) formées par un plat avec des trous percés (14), à visser sur la structure de plaque, et un évidement en forme de fenêtre (15) et des pièces mâles (6) formées par un autre plat avec des trous percés (14), pour les visser, et une saillie courbée de type crochet (16), adaptée pour être enchâssée dans la fenêtre (15) des pièces femelles (5).

11. Établi, selon la revendication 3, **caractérisé en ce que** la surface de la plaque de base (2) et des plaques de support (4, 4', 4") ont des fentes (17) passant transversalement et/ou en longueur de l'une à l'autre de ses extrémités, conçues pour insérer des butées de sécurité (18) pour positionner les pièces à découper.

12. Établi, selon l'une quelconque des revendications 1 à 11, **caractérisé en ce que** la plaque de base (2) est composée d'une série de bandes dans un agencement parallèle.

FIG. 1

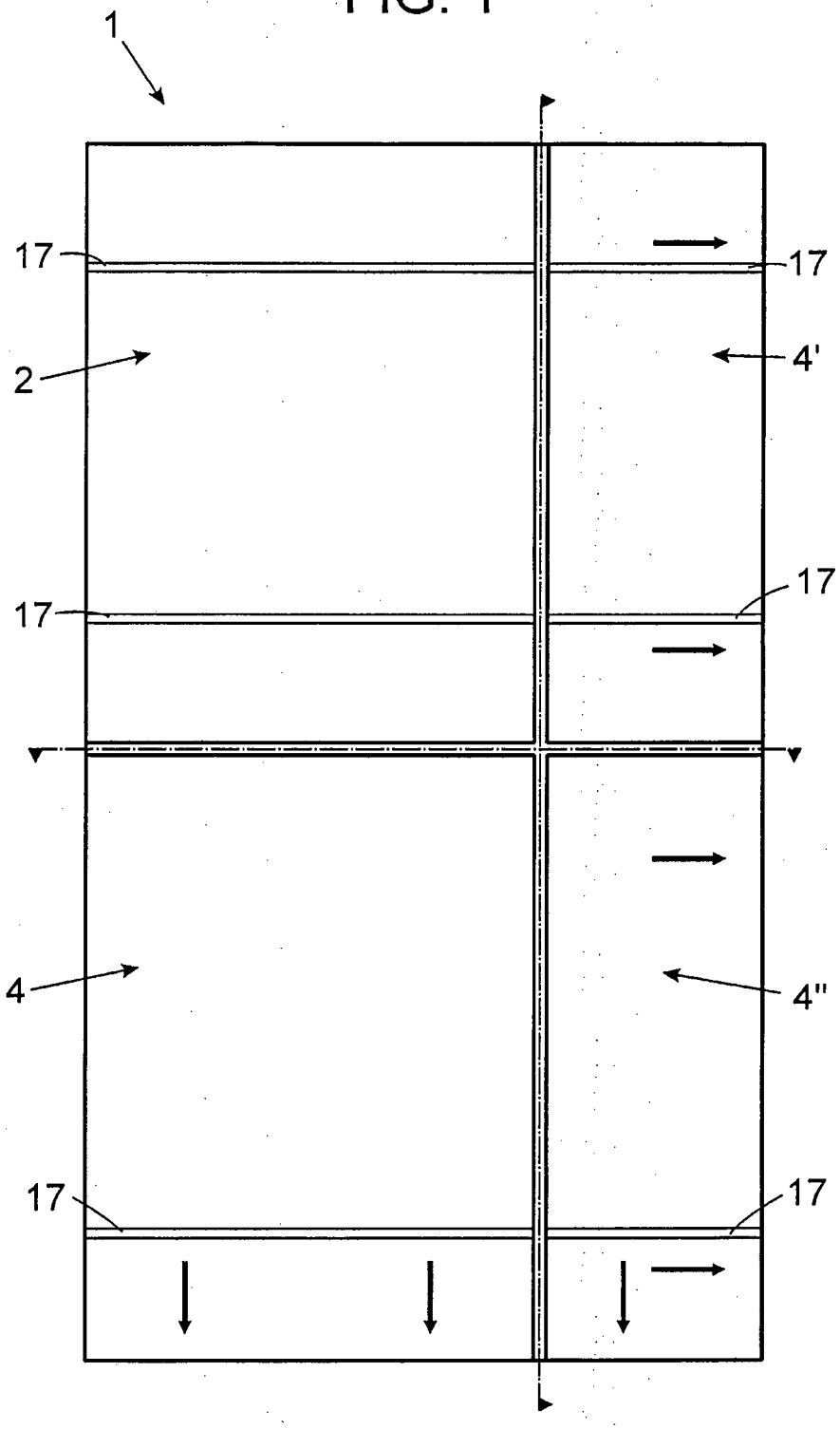


FIG. 2

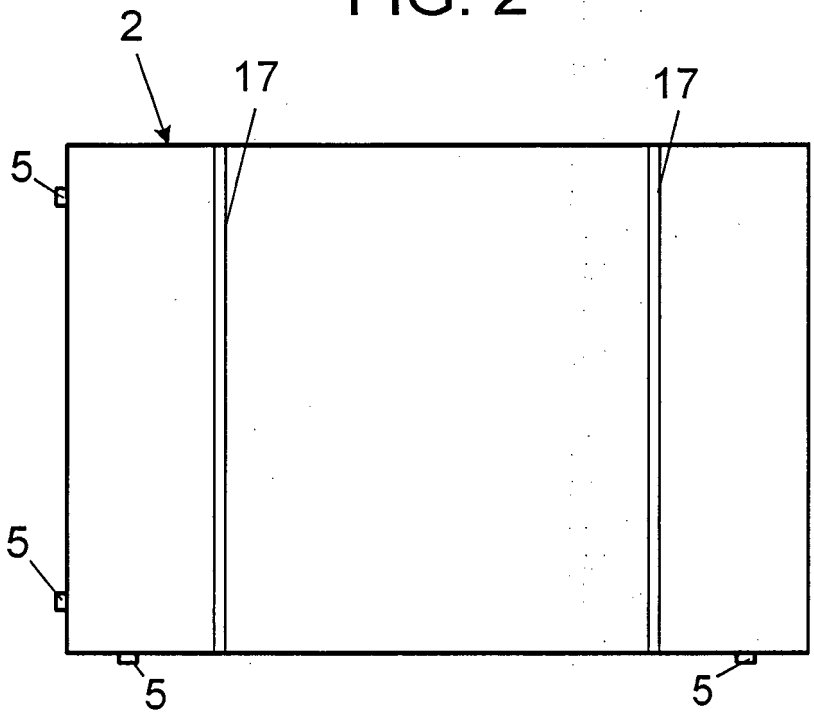


FIG. 3

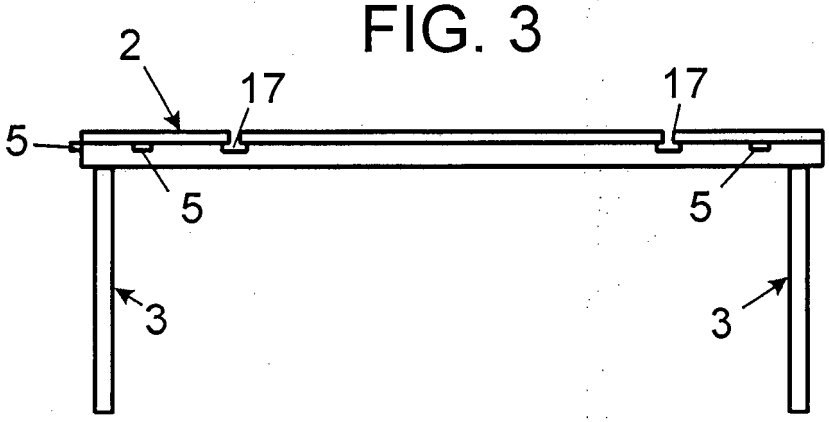


FIG. 4

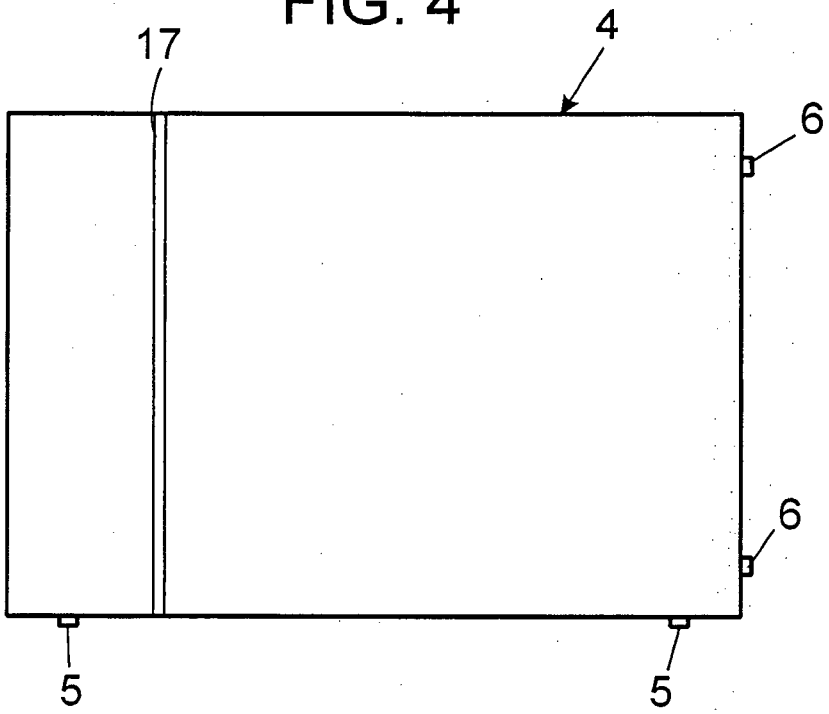


FIG. 5

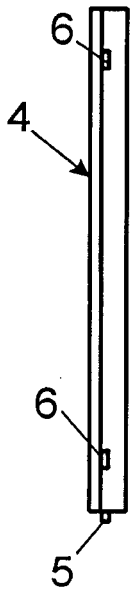


FIG. 6

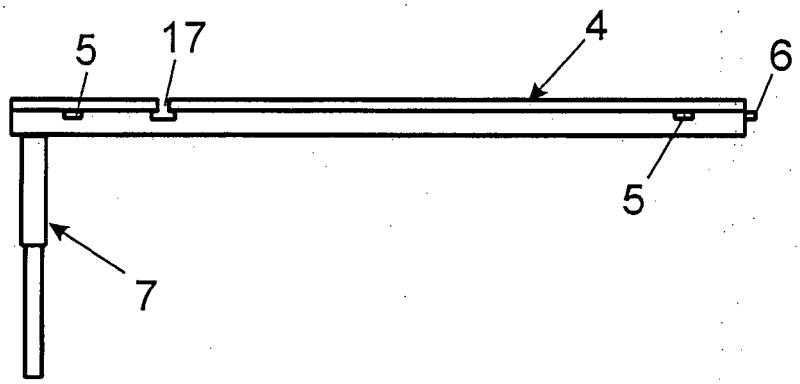


FIG. 7

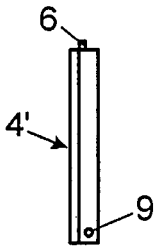


FIG. 8

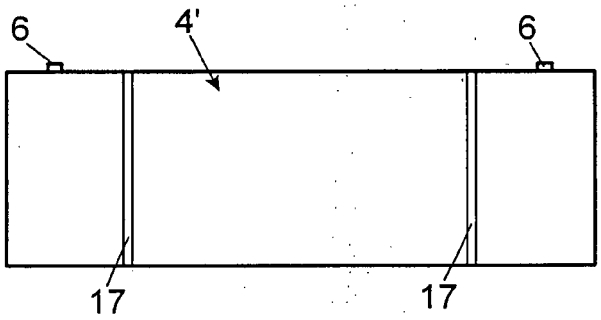


FIG. 9

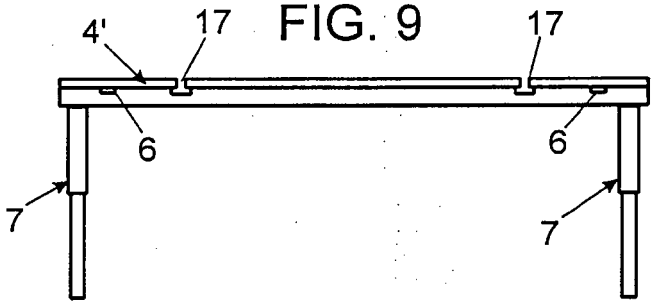


FIG. 10

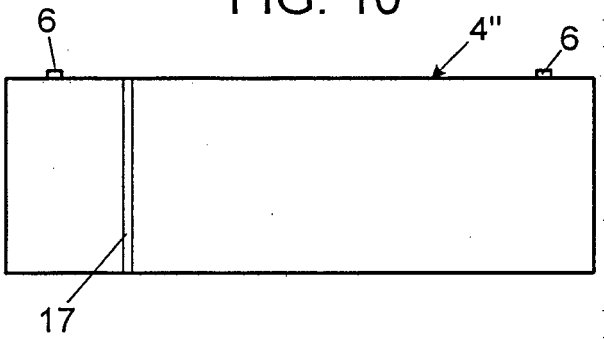


FIG. 11

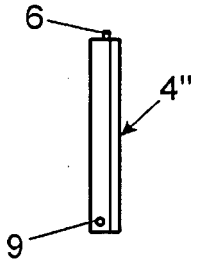


FIG. 12

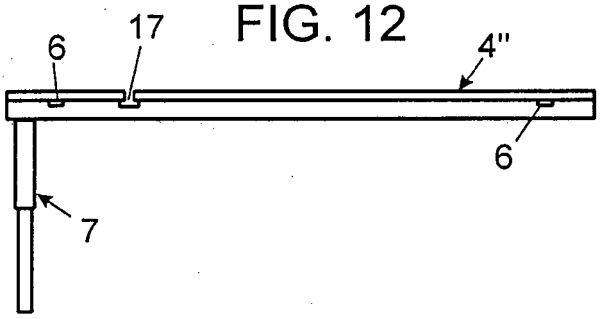


FIG. 13

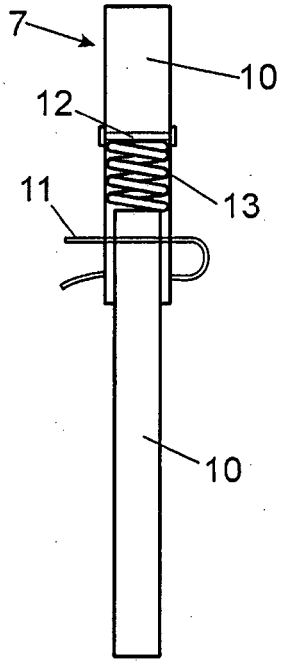


FIG. 14

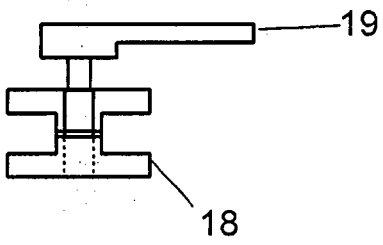


FIG. 15

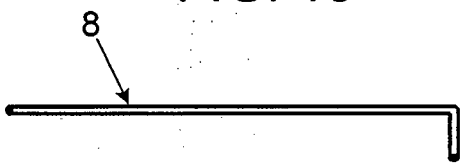


FIG. 16

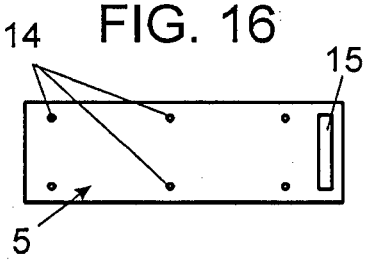


FIG. 17

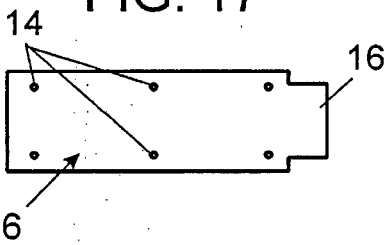


FIG. 18

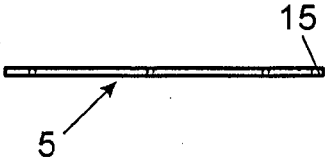
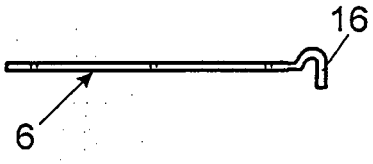


FIG. 19



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Patent documents cited in the description

- US 2011232805 A **[0007]**