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54 **Multi-functional foldable tool/box/carriage/lounge assembly.**

57 It is a new tool box structure, which comprises an outer box that consists of several rigid boards, and an inner box for storing objects. The boards in the outer box are linked together by means of several L-shaped elements in a foldable manner. When the outer box is unfolded and spread into a flat surface, a flat board is formed to be used as a lounge for a person to rest or to lie on under a car to repair the same. Upon the lounge being folded up, a tool box is formed to store tools and a pillow. The both sides of the box are furnished with rings and strap for carrying convenience. The bottom of the box is mounted with castors for pulling convenience.

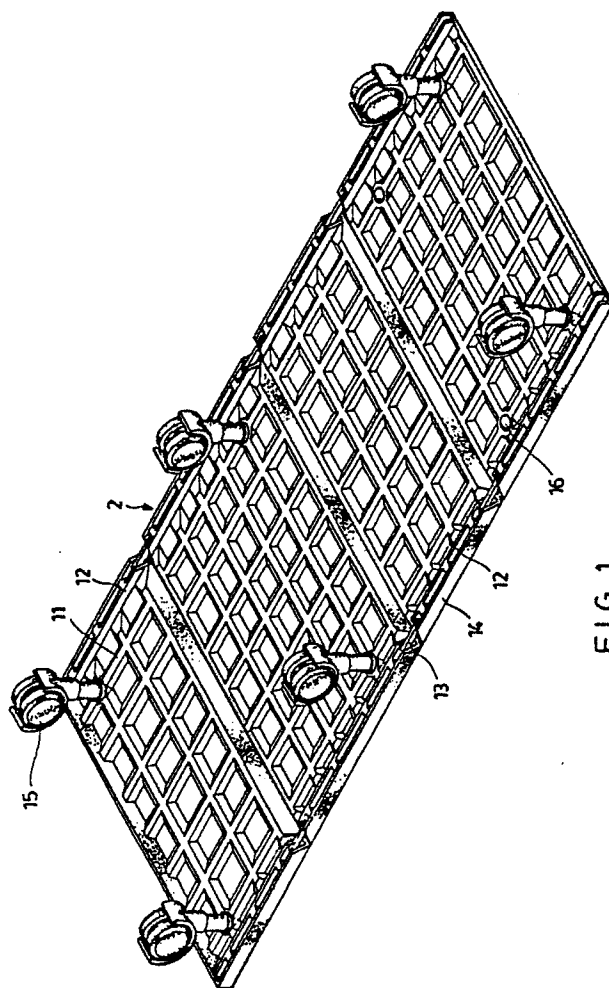


FIG. 1

MULTI-FUNCTIONAL FOLDABLE TOOL BOX/CARRIAGE/LOUNGE ASSEMBLY

This invention relates to tool box, particularly a multi-functional foldable tool box, carriage and lounge assembly.

To people who are living in increasingly narrow space, all activities are limited under such an environment; and making efficient use of space in a limited space is relatively important in the current product development.

There are kinds of tool boxes in the market which are simply made of plates with only a single function. They are large, heavy and not convenient for carriage. They are not foldable, either. Therefore, they cannot satisfy requirements of the modern people.

The present invention relates to an innovative tool box, especially referring to a multi-functional tool-box/carriage/lounge assembly.

The major objective of the present invention is to provide a multi-functional tool box that minimize space requirement in using or storing. It is composed of a foldable case body and an inner box to contain tools and/or other articles therein. The case body can be folded to enclose the inner box to form a complete tool box.

Another objective of the present invention is to provide a lounge by spreading of the case body for performing service under chassis or low and narrow space.

Another objective of the present invention is to provide a tool box which can be used as chair or working chair as well.

Another objective of the present invention is to provide a tool box with castors to ease moving and operation with minimum effort.

An embodiment of this invention is described by way of example, with reference to the drawings in which :

Another objective of the present invention is to provide a tool box of which the upper layer of the inner box is provided with a pole which, contacting the cover, being pushed downward on released back upward when the cover is closed or open, controls the inward and outward movement of the drawer of the inner box which tools and a pillow may be stored in or taken out from.

Fig. 1 is a perspective view of a back of a lounge from a case box according to the present invention;

Fig. 2 is a perspective view of the lounge spread from a case body according to the present invention;

Fig. 3 is a perspective view of an inner box of one embodiment according to the present invention;

Fig. 3-1 is a cross-sectional view of a portion of the box shown in Fig. 3 according to the present invention ;

Fig. 3-2 is a cross-sectional view of another portion of the box shown in Fig. 3 according to the present invention;

Fig. 4 is a perspective view showing a lounge folded up into a box according to the present invention;

Fig. 5 is a perspective view showing the outlook of a box after being assembled according to the present invention;

Fig. 6 is an illustrative view showing one application of the embodiment according to the present invention;

Fig. 7 is a perspective view of the back of another embodiment of the present invention being unfolded into a lounge;

Fig. 7-1 is a perspective view showing a castor and one mounting device of the lounge as shown in Fig. 7 according to the present invention.

Fig. 1 is a perspective view of the back of an embodiment of the present invention in the form of a lounge unfolded into from an outer box 1 (see Fig.5) which is composed of a plurality of rigid plates 11 . Each plate has a plurality of steel angles 12 attached to its side. Said plates 11 are connected in series by means of one or more connecting pieces 13 at each joint of the two adjacent angles 12 to form a lounge on which a repairman may lie down and do some repair job underneath a car. Fig. 1-1 is a magnified perspective view of one portion of Fig. 1, showing one said connecting piece 13 and the joint thereabout. Each said angles 12 is made to have a length in conformity with either the length or the width of the relevant plate 11. Two opposite sides 14 of the said plates 11 are folded up so that to said sides 14 the said angles 12 may be fixed. One pinhole 121, 122 is provided to each end of the angle 12 for the pin 131 provided at the two ends of the connecting piece 13 to rotate and slide so that with said connecting pieces the plates may be connected and folded. Moreover, to facilitate the operation of the said lounge 2, a plurality of mounting holes 16 are provided to the plates at their sides for quick mounting of the casters 15. And, to maximize the rigidity against outer pressure, it is preferable that six or more than six casters be adopted. Fig. 2 is a perspective view of one embodiment of the present invention spread up from an outer box into a lounge. Being composed of plates 11 , the said lounge 2 has a flat surface and plurality of mounting holes 16 at the bottom where said casters 15 may be fixed to while the tool box 4 (see

Fig.5) containing the said lounge 2 and the inner box 3 (see Fig.4) is used. And, one locking device 17 is between the 2 mounting holes 16 and a hasp 42 is provided to one plate serving as cover 41 of the outer box 1 of the said tool box 4 (see Fig.5) so that by means of the said locking device 17 and the hasp 42 the said cover 41 may be secured to the said tool box 4. A pillow 5 may be placed on one side of the lounge 2 to make said lounge 2 comfortable to lie on. Fig. 3 is a complete perspective view of one embodiment of the present invention. Fig. 3-1 and 3-2 are plane/cross-sectional views of 2 portions of Fig. 3. The inner box 3 is actually a hollow body walled by a number of rigid plates. A plate 31 is used to divide the said box into an upper layer and a lower layer. In the lower layer one or more than one drawer 32 is provided for accommodation of assorted tools, and for baffling said tools as well as for better rigidity. A pole 33 is provided thereat in the upper layer of the said inner box 3. The upward and downward movement of said pole may cause the out-sliding and opening of the said drawer 32 in the lower layer. The pole 33 is pushed downward by the contacting piece 35 attached to the cover 34 of the inner box 3 when the said cover 34 is closed. A self-locking device 36 is provided to the cover 34 to ensure security of the box. Said self-locking device is composed of a latch 361 and a spring 362. Also by means of the bevel provided to the said self-locking device 36. The said device 36 may be self-locked when the cover 34 is closed. Two rings 38 are provided to the two opposite sides of the inner box 3 for connecting the snap-hook 61 on the belt 6 (see Fig.5) by means of which the said box may be used as a carriage.

Referring to Figs.4, 5 and 6, the easy-to-mount castors 15 may be rapidly mounted to the mounting holes 16 on the outer box. With the castors mounted on, the box may be easily moved when pulled with the belt 6.

Fig. 7 shows a perspective view of the back of another embodiment of the present invention in the form of a lounge. Fig.7-1 is a perspective view showing a caster and one mounting device of the lounge in Fig. 7. The outer box 1 as shown in Fig. 5 is composed of a plurality of rigid plates 11' each of which has a plurality of L-shaped steel angle 18 attached to its side edges. Plates with said steel angle 18 mounted on its sides are put together in series to form a lounge 2' by means of a number of connecting piece 13 connecting the said L-shape steel angles at their joints.

For easy operation of the said lounge 2', a number of T-shaped grooves 19 are provided at the edges of the said plates 11' for accommodation at casters 15' which are easy to mount to or detach from the said grooves 19. Said T-shaped grooves

19 have their one end closed so that the said casters mounted thereto may be quickly and firmly secured. Said T-shaped grooves 19 are covered to protection covers to prevent any possible enjury of human body cuased by it during the operation. Also, long grooves 21 are also provided to the front side of the said plates 11' for the mounting of the casters 15' when the lounge is transformed into a tool box 4.

Claims

1. A tool box assembly comprising :

-a case body composed of a plurality of rigid plates connected in series by means of angle steels provided at each joint, incorporated with castors installed in T-slots protected by protection covers, convertible to a lounge for service under chassis by spreading of the plates;

-an inner box in the form of a hollow body divided by a plate into one upper layer and one lower layer; to said lower layer one or more than one drawer being provided for storing assorted tools;

-one pole being provided to the said upper layer, said pole which connects a contact piece fixed to the cover provided to the said case body may be pushed downward by the cover when the cover is pushed downward and also be released by means of a spring provided to itself so that the lower drawer connected to the said pole may slide open and close ;

-two rings being provided to two opposite sides of the said box and by means of said rings a belt with two snap-hooks at its ends may be used to carry the said box.

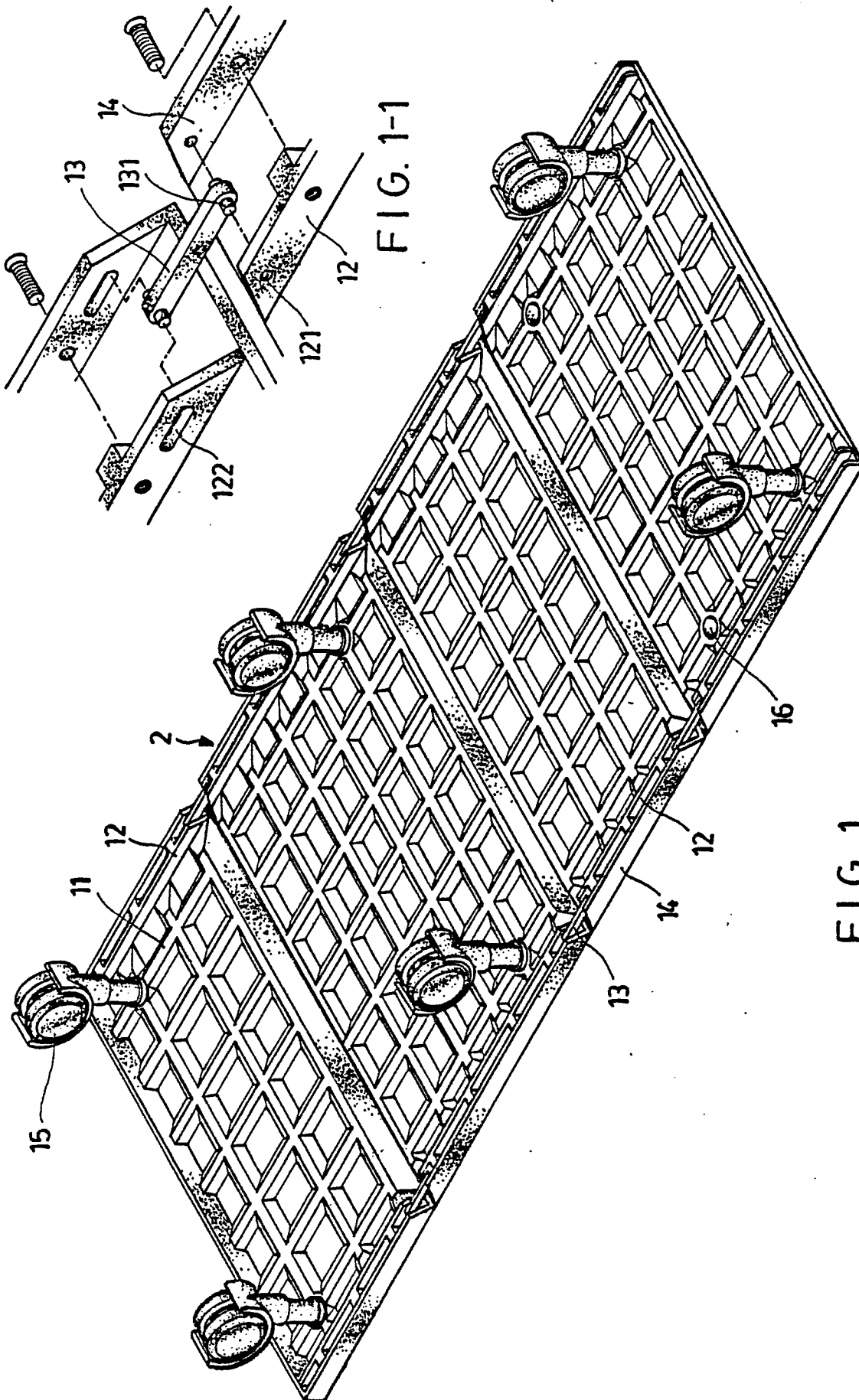


FIG. 1-1

FIG. 1

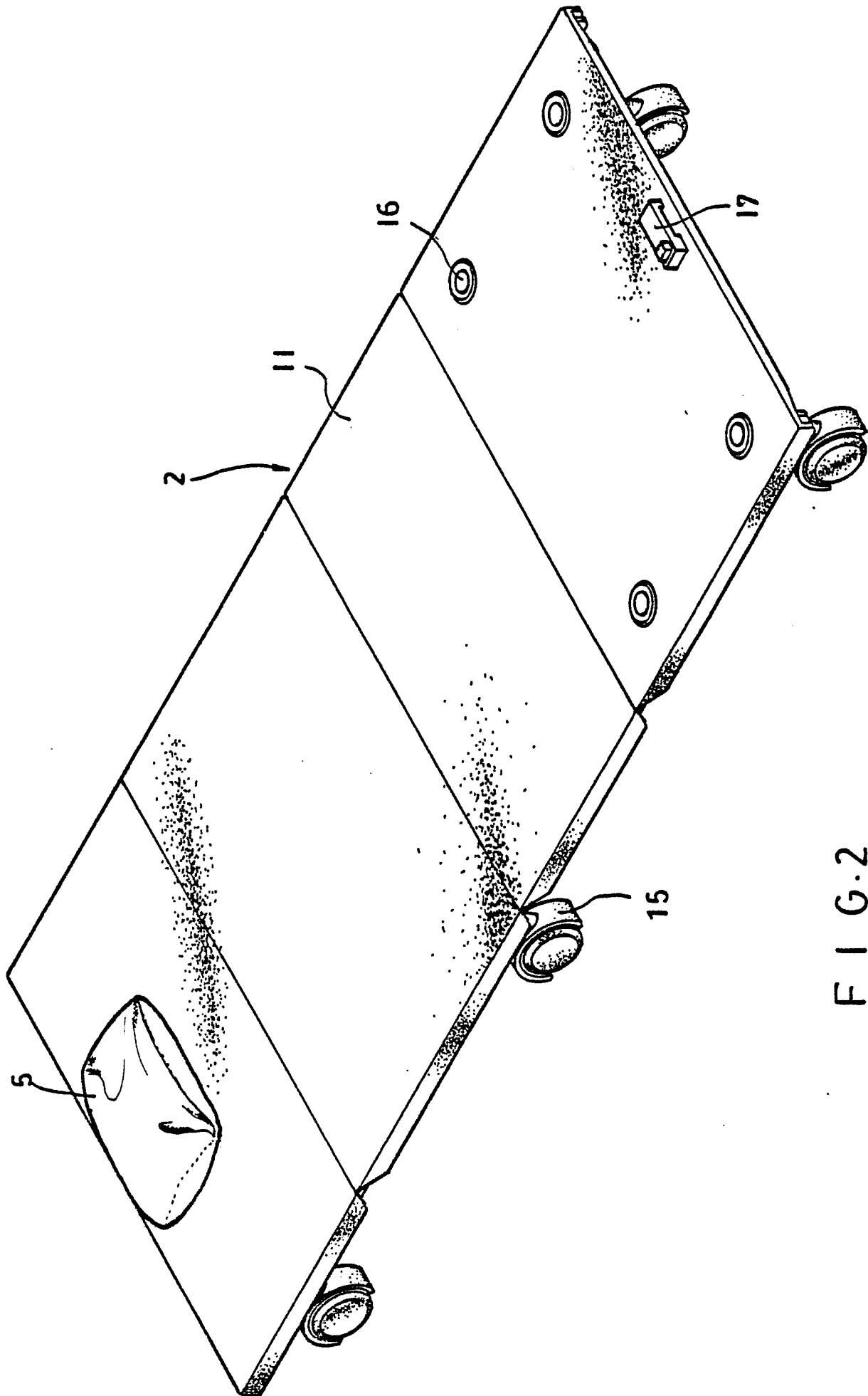


FIG. 2

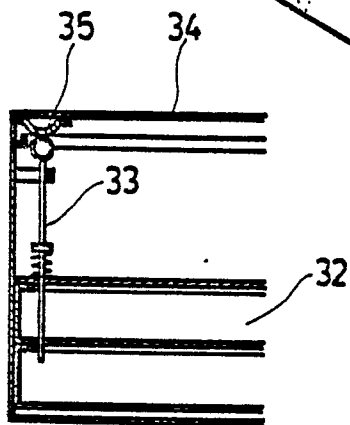
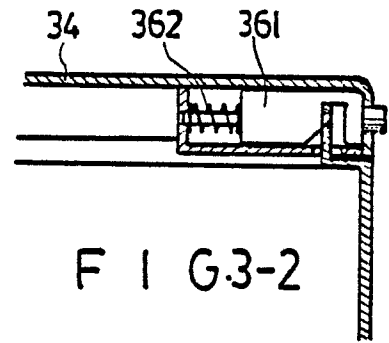
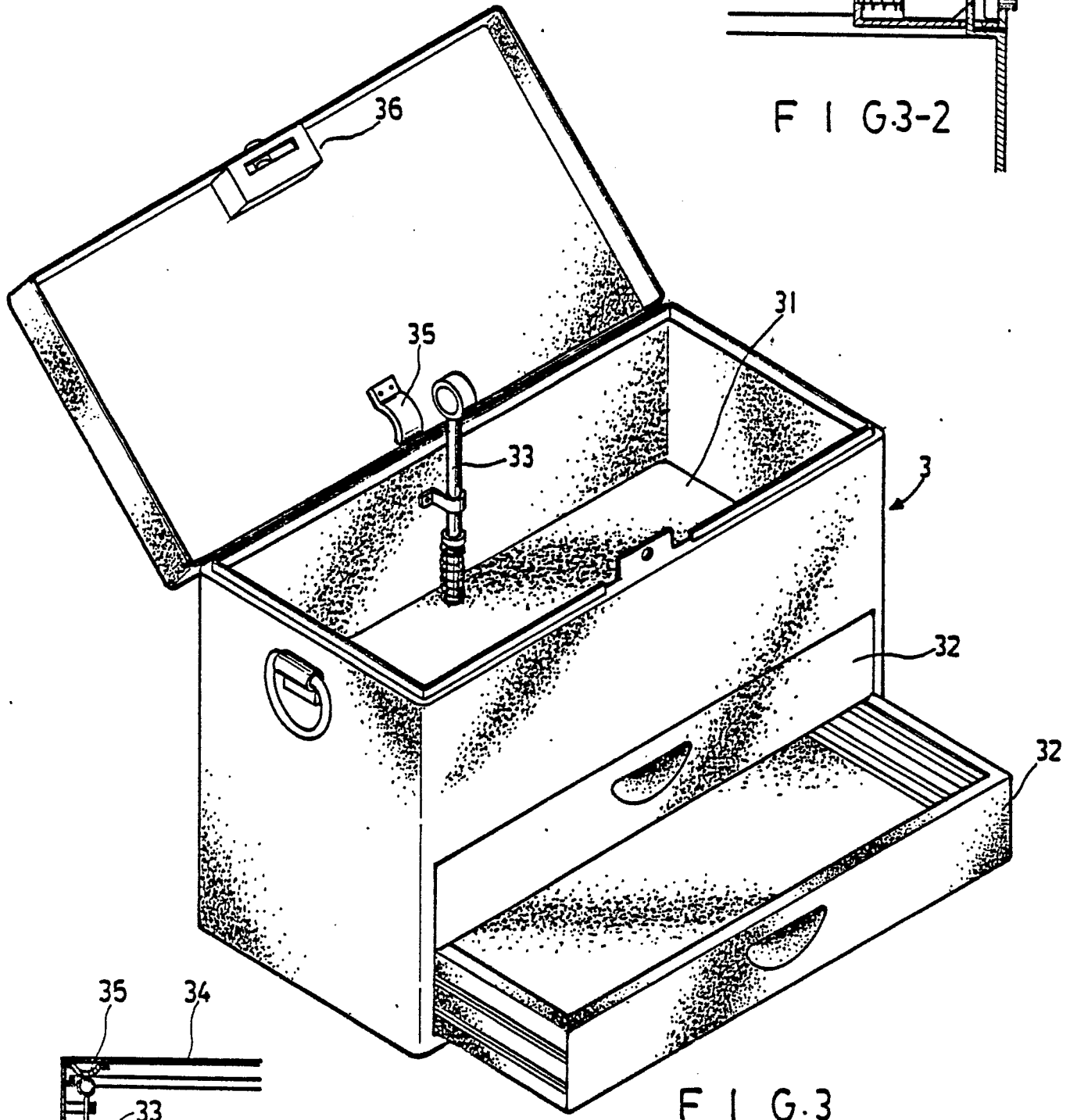
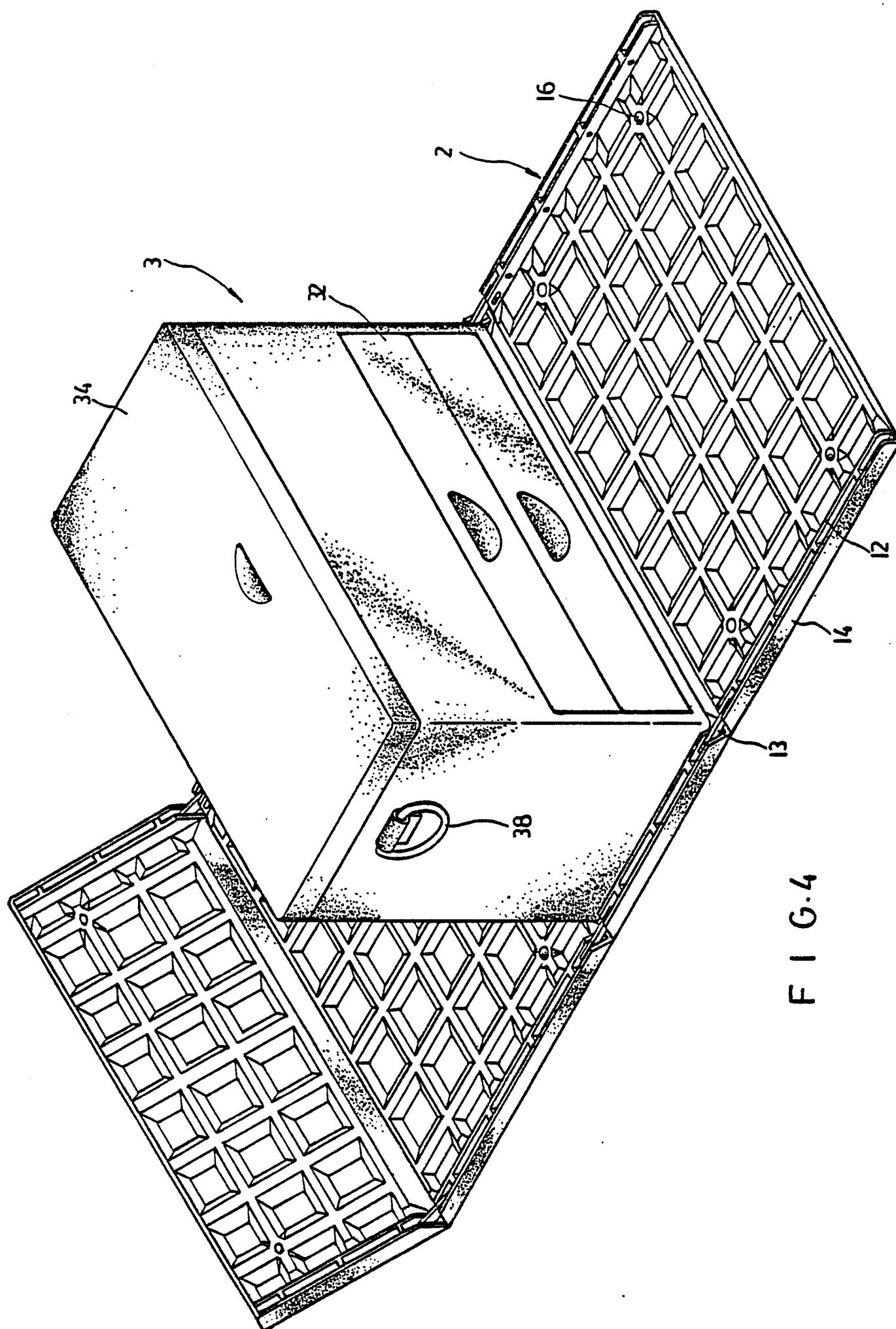
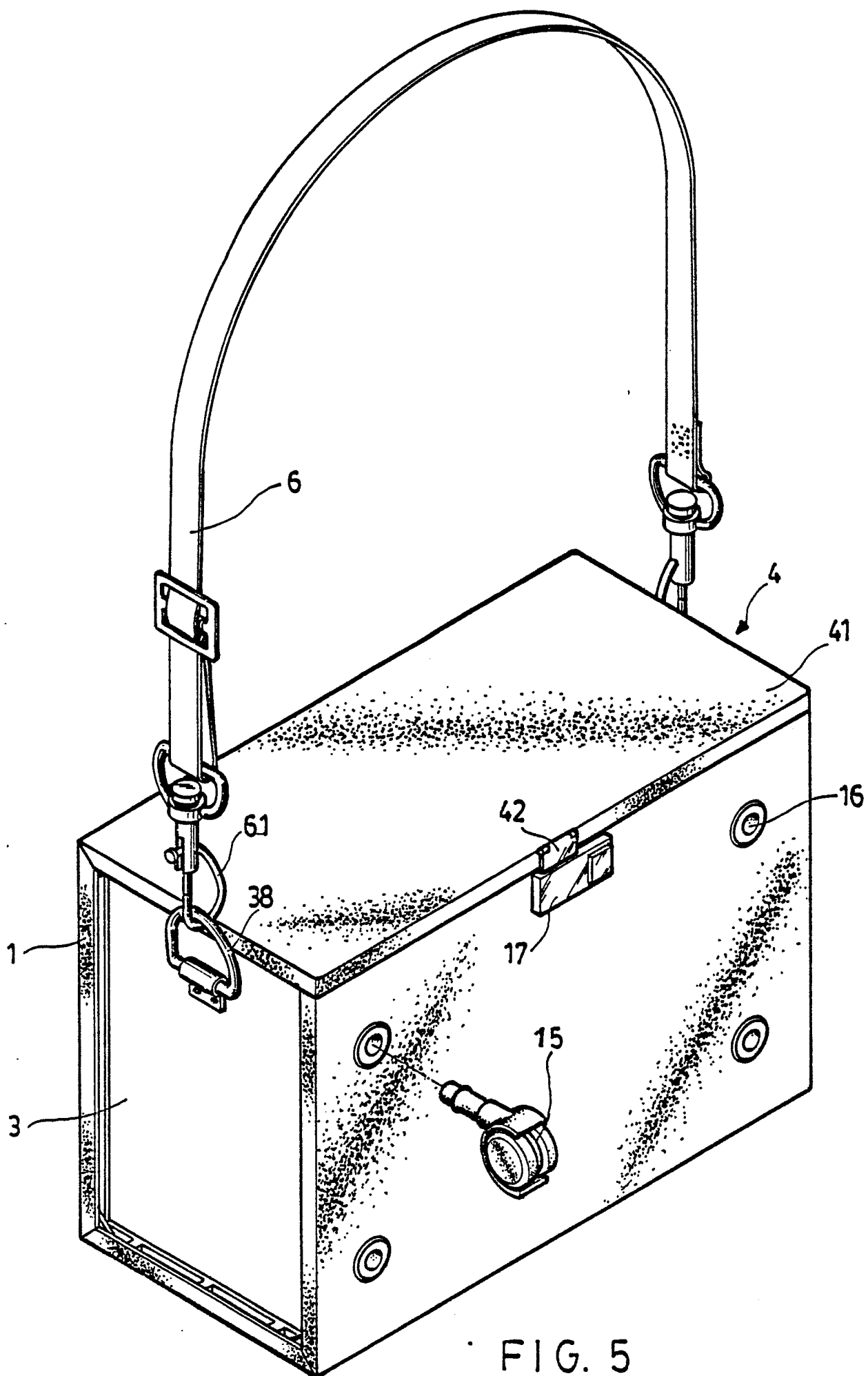


FIG. 3-1



F I G. 4



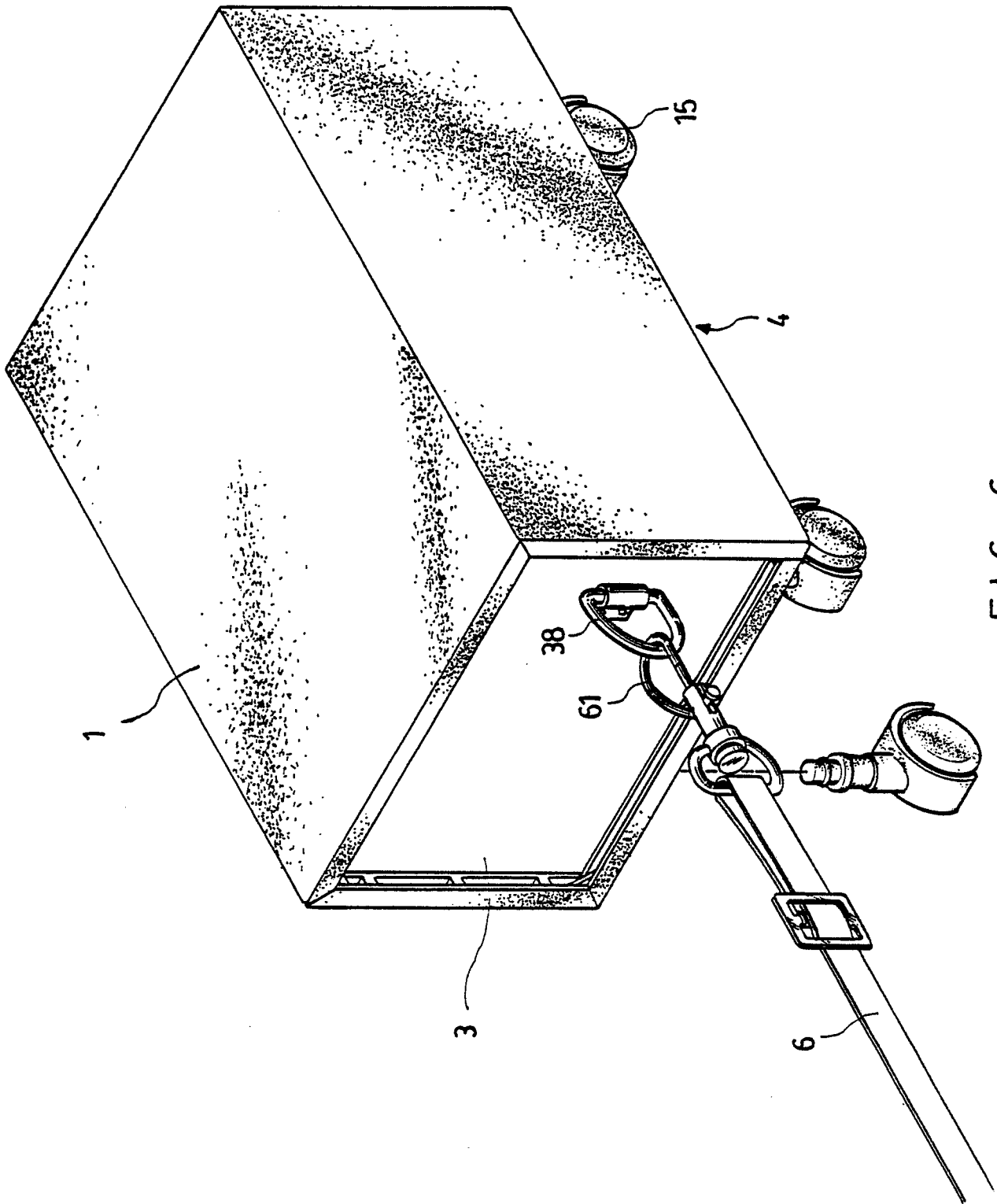


FIG. 6

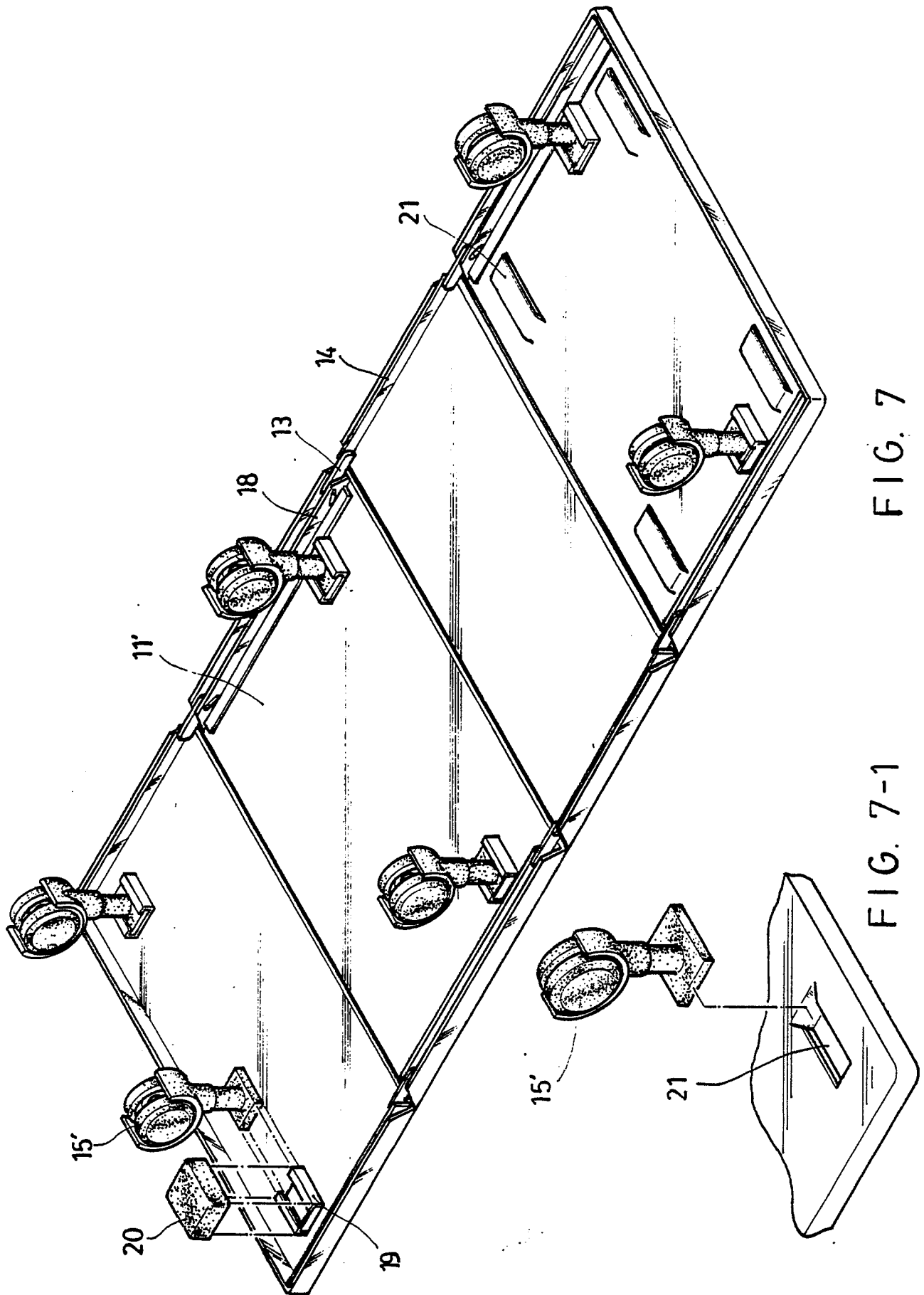


FIG. 7

FIG. 7-1



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DOCUMENTS CONSIDERED TO BE RELEVANT															
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)												
Y	DE-U-8 700 518 (CHEN) * Whole document * ---	UNIQUE	B 25 H 3/02 B 25 H 5/00												
Y	AU-B- 437 033 (POWELL) * Figure 1; page 4, line 19 - page 5, line 7; claim 1 * ---	UNIQUE													
A	US-A-2 671 709 (RADZYNER) * Figures 2,4; column 2, lines 7-34 * ---	UNIQUE													
A	US-A-4 580 799 (QUINONEZ) -----														
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)												
			B 25 H												
The present search report has been drawn up for all claims															
Place of search THE HAGUE		Date of completion of the search 18-11-1987	Examiner CARMICHAEL D.G.												
<table border="0"><tr><td>CATEGORY OF CITED DOCUMENTS</td><td></td></tr><tr><td>X : particularly relevant if taken alone</td><td>T : theory or principle underlying the invention</td></tr><tr><td>Y : particularly relevant if combined with another document of the same category</td><td>E : earlier patent document, but published on, or after the filing date</td></tr><tr><td>A : technological background</td><td>D : document cited in the application</td></tr><tr><td>O : non-written disclosure</td><td>L : document cited for other reasons</td></tr><tr><td>P : intermediate document</td><td>& : member of the same patent family, corresponding document</td></tr></table>				CATEGORY OF CITED DOCUMENTS		X : particularly relevant if taken alone	T : theory or principle underlying the invention	Y : particularly relevant if combined with another document of the same category	E : earlier patent document, but published on, or after the filing date	A : technological background	D : document cited in the application	O : non-written disclosure	L : document cited for other reasons	P : intermediate document	& : member of the same patent family, corresponding document
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