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(54) **IMPROVEMENTS IN AUXILIARY STAIRS FOR PEOPLE WITH REDUCED MOBILITY**

(57) The object of this invention is aimed at making easier for people with reduced mobility to go upstairs or downstairs. In order to reduce the height of the steps of a stairs previously manufactured, an integral assembly is inserted in one of its laterals working as auxiliary steps, adjustable in height, with less width than the width of the original steps over which the ensemble is placed, following the pattern described in the upper figure.

The user of such stairs previously manufactured can use the present invention in an auxiliary way, putting one foot or two feet over the ensemble before moving towards a new step. This way the effort necessary to climb the step of the stairs on which it is placed is reduced, as well as the height up to which the feet have to go, being especially useful for aged people or people with articular problems.

The improvements on the auxiliary stairs for people with reduced mobility mainly focus on the folding mechanism of the stairs. To this purpose, the possibility of folding the steps has been taken into account, in order to get a better exploitation of the space.

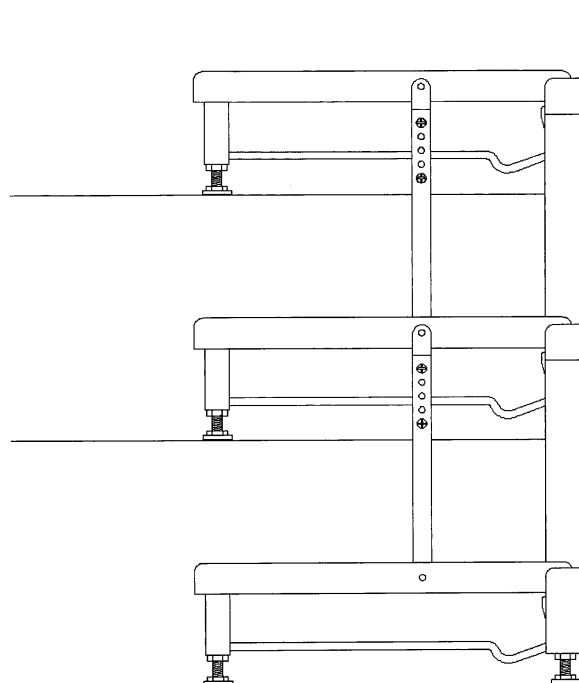


Figure 1.13

Description

[0001] Improvements introduced in the auxiliary stairs for people with reduced mobility, folding and with an adjustment system, depending on a section of fixed stairs on which it is supported.

Object of the invention.

[0002] The present invention aims at the registration of improvements in auxiliary stairs for people with reduced mobility adding prominent innovations and advantages in order to improve the adaptation to people with reduced motor skills.

Background.

[0003] In the field of building it is usual to find all kinds of adaptations to improve the quality of life of people with mobility problems, with a legislation that rules all sorts of new buildings with this purpose.

[0004] The main problem is in particular houses or buildings constructed prior to the entry in force of the legislation above-mentioned. Therefore, these buildings can show an endless amount of adaptability problems. Both unworkable elevators and narrow passages of stairs are part of the problems a person with mobility problems can face every day.

[0005] The improvements in the auxiliary stairs for people with reduced mobility object of this application help to sort out the problems above-mentioned, providing, therefore, a fundamental improvement in the quality of life of people that can fend for themselves. Yet, they have enough limitation so as to mean an effort a series of routine gestures for most of us.

[0006] The system as a whole is appropriate to be used on passages with narrow steps or places on which its usage is more unusual, even to help the cleaning of the areas covered by the mechanism once it is folded.

[0007] As background we quote the main patent P201431422, which claims a system to make easier walking through sections of stairs, especially useful in cases of people with articular problems. The system claimed by such patent made possible that the space between steps would be reduced to a half with the consequent reduction of the effort needed to walk over them.

[0008] The original patent was focused on making access easier for everybody, with a system easy to manufacture and assembly. Yet, some circumstances may arise for the system not to be always placed, mainly in four situations:

- Places where the steps of the stairs on which the object of the patent is placed are not wide enough for a person without their motor skills reduced to be able to walk through without being bothered by the system.
- Places where the person or people who need the

invention do not circulate regularly.

- Places adapted to be used both for people with reduced motor skills and for any other kind of person (in particular houses to be rented in vacation).
- Places on which make easier cleaning the stairs on which the invention is placed.

[0009] As we can see in the examples, there are enough possibilities in which the original invention can be benefited by the improvements introduced in this invention, improvements that would justify a bigger complexity and costs of production.

Description of the invention.

[0010] The invention consists of a section of auxiliary self-supporting and folding steps which, placed over stairs already built, reduce the height of the steps to climb. Such steps are less wide than the steps of the stairs on which they are placed for the user to put his feet on the step of the previously built stairs in order to, next, put one foot or both feet over the step corresponding to the improvements described in this patent and thus successively until the whole section of steps is climbed. Thus, reducing the height between the steps, it is possible to reduce the effort required to climb them.

[0011] Another feature of the improvements is that it is a self-supporting system and adjustable in height and length in each and every step, so that it is not necessary either to modify or to damage the original stairs section, even though the seize of its steps is irregular.

[0012] In the same way, the system can be folded and unfolded at will depending on the necessities of the user.

[0013] The auxiliary stairs is fixed over an existing stairs and covers a lower width, with the aim that the user can walk alternatively over the original stairs and the improvements object of the present application. The steps are made up of a fixed base - tread - and a set of pieces that work as risers and supports. The bases that make each tread of the auxiliary stairs are fixed by means of screws linked to some frames over which the legs are affixed, adjustable in height. One of the frames above-mentioned remains immobile on the floor while the piece working as tread revolves around it, at the same time the pieces working as frame of the opposite place revolves around the opposite side to the tread. In order to secure the strength of the ensemble, both frames are joined by means of a linkage of connection, keeping always the same distance between of its points and achieving this way the same angle for both pieces, when the system is both folded and unfolded.

[0014] Likewise the ensemble is provided with a system to connect the treads of all the steps, so that none of the steps is left mistakenly in a different position than the others.

[0015] To complement the present description and with the aim of providing a better understanding of the features of the improvement, we add as part of the de-

scription, a set of plans in whose drawings, in an explanatory and non-limiting way, the most significant details of the invention are represented.

Brief description of the drawings.

[0016]

Figure 1: Lateral plan of the assembly

Figure 1.1: First piece of the ensemble of fixed legs (beginning). It corresponds to the piece 1 of the profile plane of the assembly.

Figure 1.2: Second piece of the ensemble of fixed legs (intermediate). It corresponds to the pieces 2 of the profile plane of the assembly.

Figure 1.3: Third piece of the ensemble of fixed legs (intermediate). It corresponds to the pieces 3 of the profile plane of the assembly.

Figure 1.4: Fourth piece of the ensemble of fixed legs (final part). It corresponds to the piece 4 of the profile plane of the assembly.

Figure 1.5: Base piece of the step, corresponding to the piece 5 of the plan. It corresponds to the pieces 5 of the profile plane of the assembly.

Figure 1.6: Mobile frame to which the external legs are attached. It corresponds to the pieces 6 of the profile plane of the assembly.

Figure 1.7: Anchoring piece of the connecting linkage between the external and internal legs. It corresponds to the pieces 7 of the profile plane of the assembly.

Figure 1.8: Connecting linkage. It corresponds to the pieces 8 of the profile plane of the assembly.

Figure 1.9: Detail of the leg. It corresponds to the pieces 9 of the profile plane of the assembly.

Figure 1.10: Fifth piece of the ensemble of fixed legs (common). It corresponds to the pieces 10 of the profile plane of the assembly.

Figures 1.11 and 1.12: Pieces of connection between bases and steps. They correspond to the pieces 11 and 12 of the profile plane of the assembly.

Figure 1.13: elevated view of the whole assembly simulating the steps unfolded.

Description of a preferred embodiment.

[0017] In view of the figures detailed and the planes submitted, we can see a preferred embodiment even though non limitative of the invention, which consists of a folding auxiliary stairs.

[0018] In figure 1 we can see a profile plane of the auxiliary stairs already built. Figure 1 shows a lateral view of the whole assembly, as a summary, where the system would be already folded.

[0019] The pieces 5 work as the tread of the stairs. Each piece 5 is made up of a piece, with the shape of a tray, folded by its four sides to provide stiffness to the piece. It contains holes on its sides on which pieces 8, 19, 11 and 12 of the profile plane would be fixed with screws.

[0020] Pieces 1, 2, 3 and 4 are profiles in "L", with different shapes and provided with holes. Such profiles work as first support - lateral legs - on which the pieces 5 lay in the case of the first, final or intermediate steps. This ensemble of pieces will always remain immobile and it is joined together by means of the pieces 10.

[0021] Piece 1 is the first of the pieces that comprise the structure of the fixed legs, in its initial step.

[0022] Piece 2 is the second of the pieces that comprise the structure of the fixed legs, being common to all the steps, except for the last one.

[0023] Piece 3 is in charge of assembling the subsets of steps between each other. It joins the pieces 2 of all the steps of the ensemble except for the first one. Likewise it works as base for the piece 10, in all the steps except for the first one where this piece would be replaced by the piece 1.

[0024] Piece 4 is the equivalent to piece 2 and it would be used in the closing step.

[0025] In order to achieve the adequate adjustment in length, pieces 1, 2, 3 and 4 are provided by a set of slanted holes which, going together by means of screws, adapt themselves to the different lengths on which the ensemble can be anchored. In order to achieve an adjustment in height the former pieces are provided with a set of slanted holes which, going together by means of screws, manage to increase or reduce the height of the ensemble.

[0026] The pieces 5 swing over the pieces 10 with the aim of achieving the folding or unfolding of the system.

[0027] The pieces 6 correspond to the other support on which piece 5 is placed and make the frame over which the external legs of the ensemble are screwed. Such pieces are articulated in the same way as the former. Thus the system is fully folded when the piece number 5 makes an angle of 90 grades over the horizontal or fully extended when the angle of 90 grades is between them.

[0028] The piece 9 is made up of some connection linkages between the pieces 10 and the piece 6. With this piece we achieve an automatic folding and unfolding of the piece 6 and the right position of it, avoiding a bad position that might compromise the stability of the en-

semble.

[0029] Pieces 8 are joined to pieces 10 by means of pieces 7, which are some shells fixed to the ensemble of pieces 1, 2 and 10, 3, 2 and 10 or 3, 4 and 10 depending on the initial step, intermediate steps or the closing step.

[0030] Pieces 9 are rubber industrial legs. They are adjustable in height to achieve an adjustment margin wider and more precise and they have a rubber base to avoid noises and adapt the structure to both different heights and places where the building on which they are placed is not in perfect state - irregular surface - .

[0031] Being modular it can be used for sections from one to infinite stairs, by just adding new intermediate units.

[0032] According to other aspect of the invention, the flat surface or tread (5) of each step the stairs is made up of can have ant slippery elements (not represented).

[0033] The fasten and assembly way are as follows:

a. Initial step. It is screwed on its lateral side to the tread of the piece corresponding to the immovable base on which the ensemble swings, made by the combination of pieces 1, 2 and 10. Two rubber legs will be placed on the holes prepared for that, one in the piece 1 and the other one in the piece 2.

On the opposite lateral, the piece 5 is screwed to the piece 5. The other two supporting legs are screwed on the holes prepared in the ends of this piece.

Being fixed by means of screws the whole ensemble, the linkage (piece 8) will be placed. For that the lateral that will remain still will be screwed to a piece 7 and a piece 10 through the holes provided with that aim, and the connection linkage will be connected on one side to the piece 7 and on the other side to the cover placed on the piece 6, all by means of screws.

b. Intermediate step. In the case of two steps ensembles this stage will not be taken into account and we will go directly to the next one.

The base of this step where the user will put his feet, as well as in all the steps of the ensemble, will be **figure 1.5**. Such step is built by means of joining together such piece and the pieces corresponding to the figure 1.3, the figure 1.2 and the figure 1.10, on their inner side, and joining together the piece corresponding to the figure 1.5 to the piece corresponding to the figure 1.6. They way to join the **figure 5** and the rest of the figures will be, like in all the cases, by means of screws and their corresponding nuts, allowing enough space between the pieces that require so for the ensemble to swing. With the aim of adapting to possible irregularities in the stairs on which this invention will be placed, the set of **figures 1.1, 1.2, 1.3, 1.4 and 1.10** is provided with grooves in their last side and this way making possible to adapt the ensemble in length.

The adjustment in height of the ensemble is given by the combination of the holes presented in both

pieces corresponding to the figures 1.2 and 1.3.

We can repeat this step as many times as necessary up to reach the penultimate step of the stairs we need to climb. In this point go mote to the stage 3.

c. Last step. The front side of it is similar to the one detailed in the previous point. The figures 1.3 and 1.4, corresponding to the pieces that work as frame over which the rubber legs are screwed, are joined by means of screws to the piece corresponding to the figure number 1.10, which will be joined by means of screws to the two holes provided in the piece corresponding to the figure 1.5.

On the opposite side, the same as in all the other cases, a piece corresponding to the figure 6 will be screwed.

We repeat the stage to connect the linkage and, once the whole ensemble of steps is made, we connect the pieces that work as base of each of them (figure 5) between each other through a combination of the two pieces corresponding to the figures 1.11 and 1.12. Both pieces are provided with a combination of holes, in the case of the 1.12, next to a torn hole in the case of the 1.11, in order to achieve the adaptation to the different heights to which the steps can be adjusted.

[0034] The details, shapes, dimensions and other accessory elements, together with the materials used in the auxiliary steps for people with reduced mobility, can be conveniently replaced by others which are technically equivalent and move away from neither the essence of the invention nor the scope defined by the claims coming up next.

Claims

1. Improvements in an auxiliary stairs for people with reduced mobility, **characterized by** being placed jointly to a stairs already built and designed to make easier the traffic, by means of the building on one lateral of the stairs already built, of steps with less width to the width of the stairs on which they are placed, and that essentially is made up of a modular system of subsets comprising:

- A base manufactured by an iron piece, depending on the tread.
- The union of a "U" shaped piece, with a length sensibly bigger than the former piece, with two pieces overlapped in the shape of a flat bar over which such base is placed, manufactured of the same material, with at least one of the upper or lower ends of each of the pieces folded squarely, depending on the riser adjustable in height.
- A flat bar shaped piece on which its two external legs are fixed.
- A connection linkage between two ensembles

on which all the legs of the step are joined.

- Two joining flat bars between the bases of the consecutive steps.

- Legs adjustable in height supported over a horizontal surface, either the floor, or the treads of the fixed stairs. They are joined to the auxiliary vertical piece. 5

2. Improvements in an auxiliary stairs for people with reduced mobility, following claim 1 characterized because the base manufactured with an iron piece, depending on the tread is folded in its four ends, and the two vertical and overlapped pieces in the shape of a flat bar have folds in at least one of their upper or lower end in order to facilitate the union to the bases and to the auxiliary piece. 10 15

3. Improvements in an auxiliary stairs for people with reduced mobility, following claim 1 characterized because the upper closing step contains in its bottom only one joining piece 4. 20

4. Improvements in an auxiliary stairs for people with reduced mobility, following claim 1 characterized because the piece that works as tread swings over the ensemble made up by the fixed legs and the pieces working as external legs swings the same way over the pieces working as tread to achieve a folding system. 25 30

5. Improvements in an auxiliary stairs for people with reduced mobility, following claim 1 characterized because the adjustment in height is performed through a series of vertical holes that make a combination of vertical and overlapped pieces so that the holes of both flat bars coincide to the desired height and are fixed by screws or any other adequate means. 35 40

6. Improvements in an auxiliary stairs for people with reduced mobility, following claim 1 characterized because the adjustment extension of the ensemble is achieved by means of some oblong holes on the pieces corresponding to the bases over which the rest of the swings. 45 50

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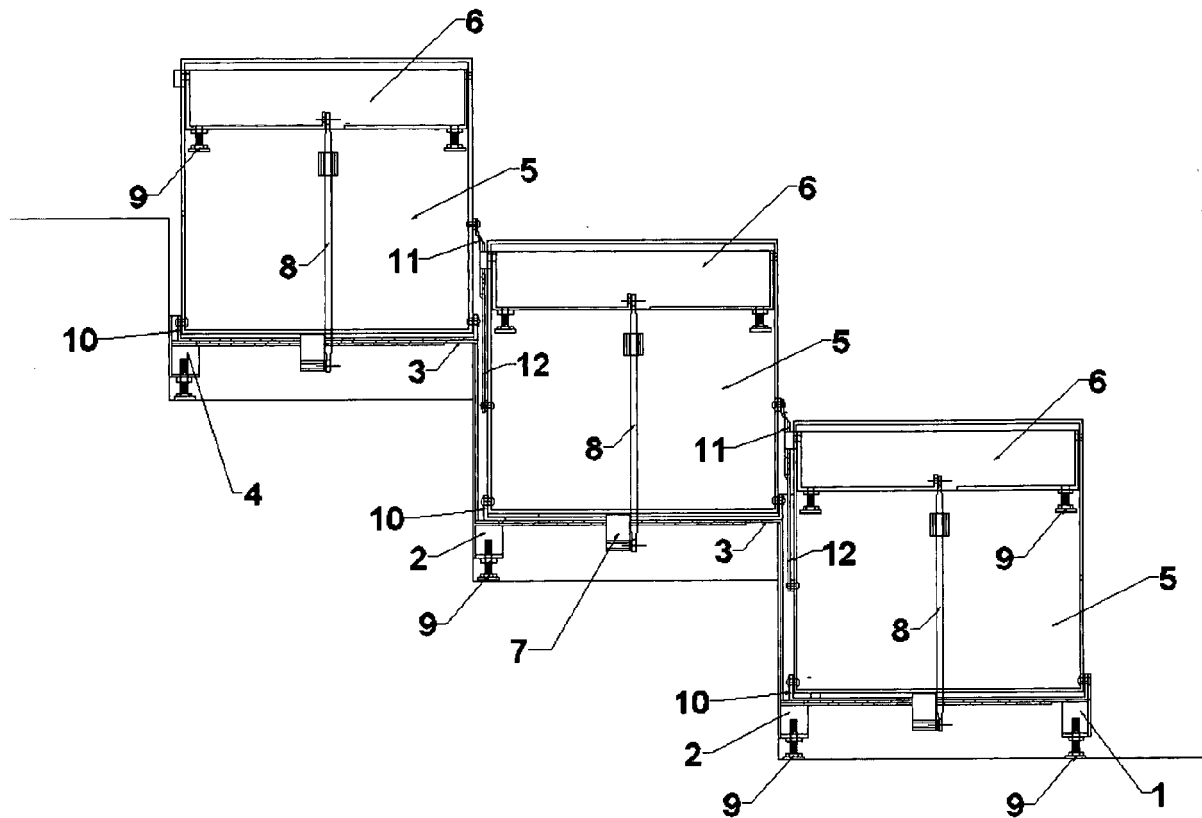


Figure 1

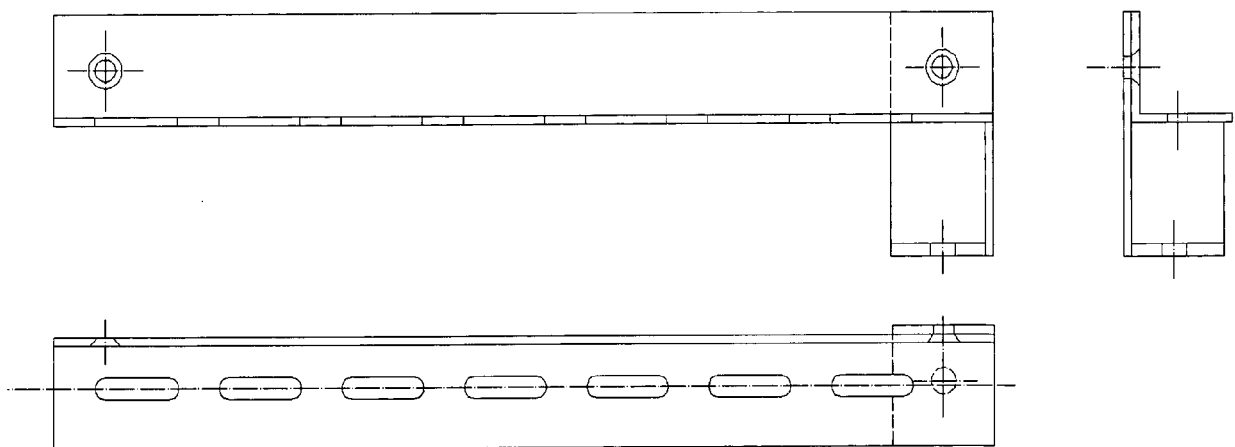


Figure 1.1

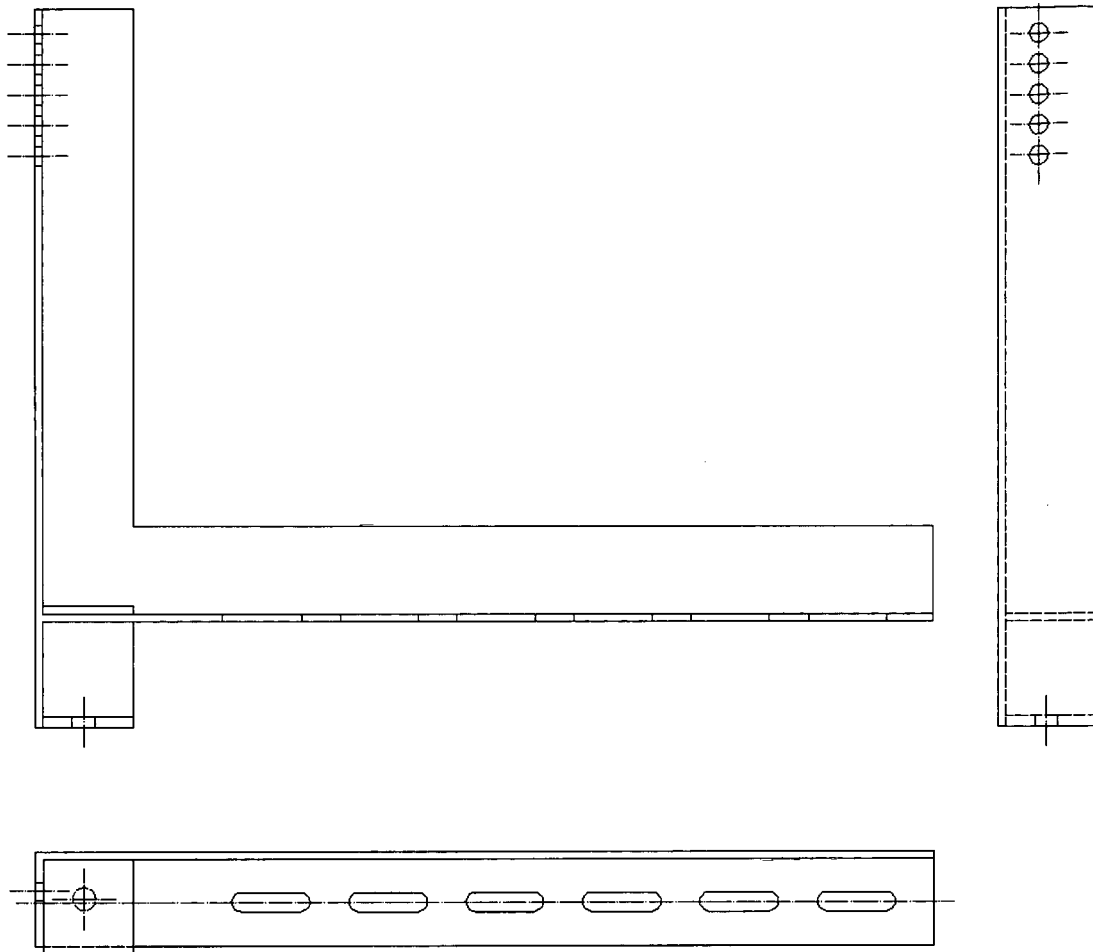


Figure 1.2

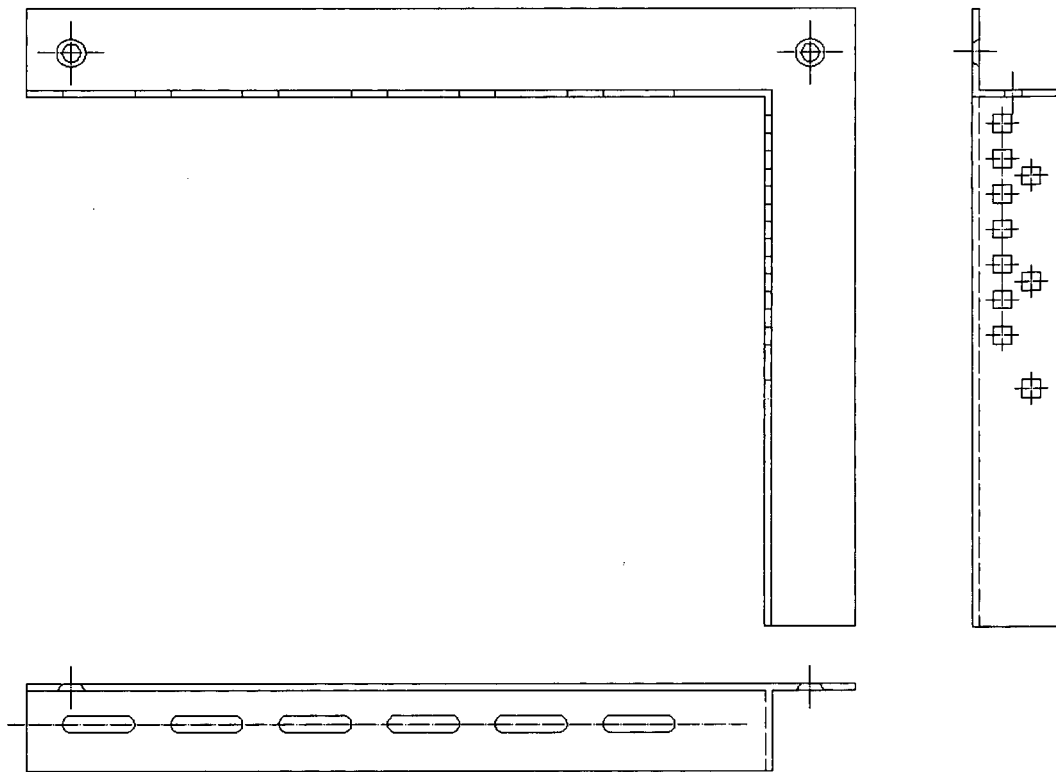


Figure 1.3

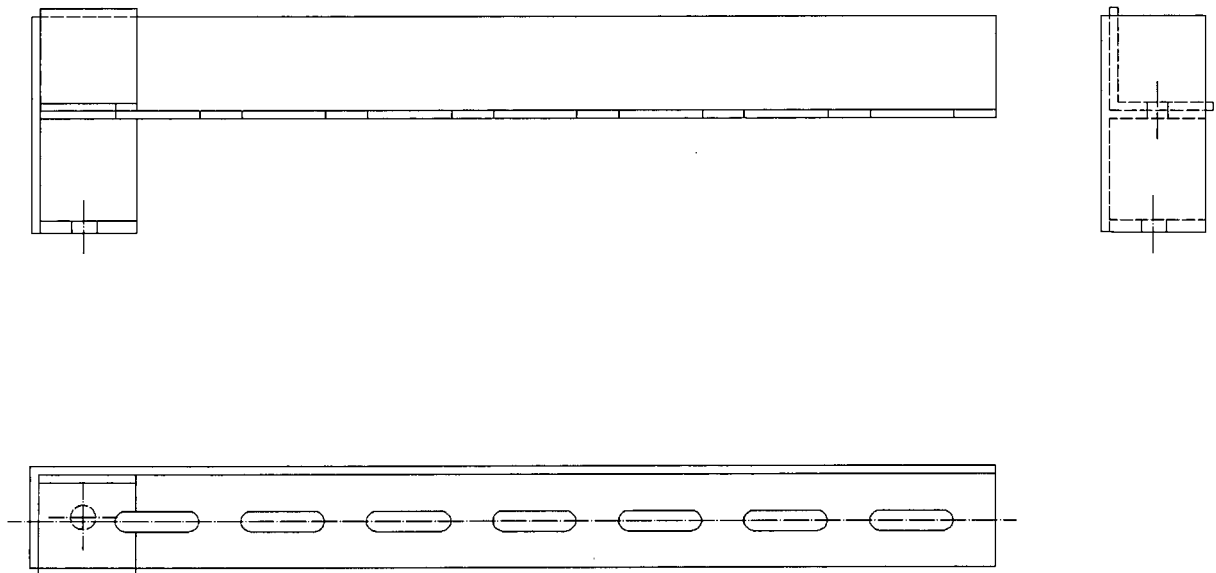


Figure 1.4

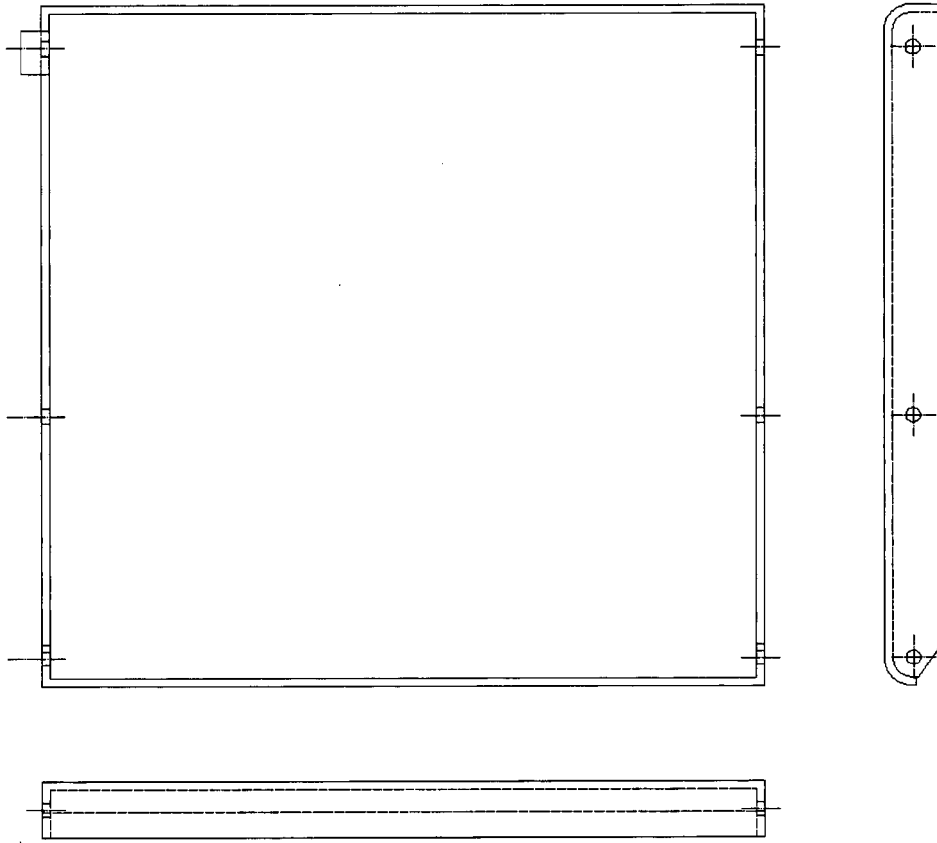


Figure 1.5

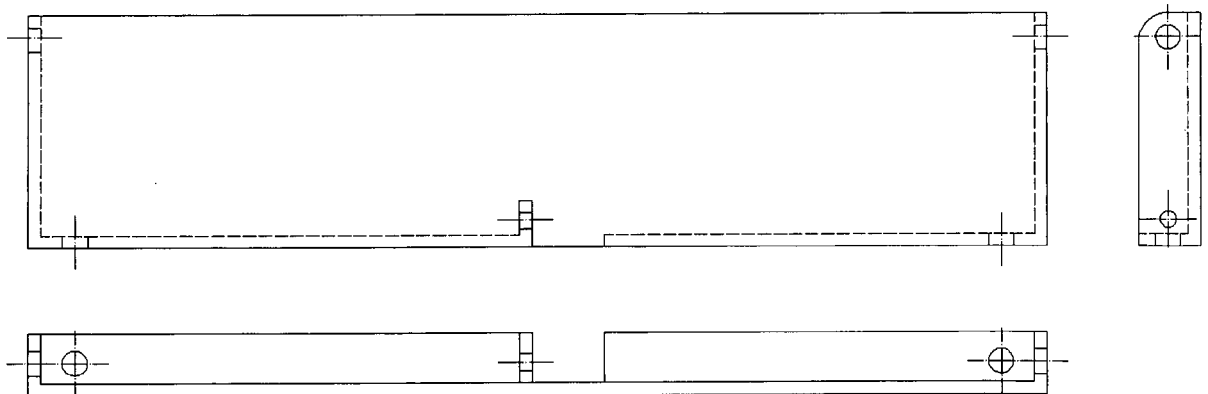


Figure 1.6

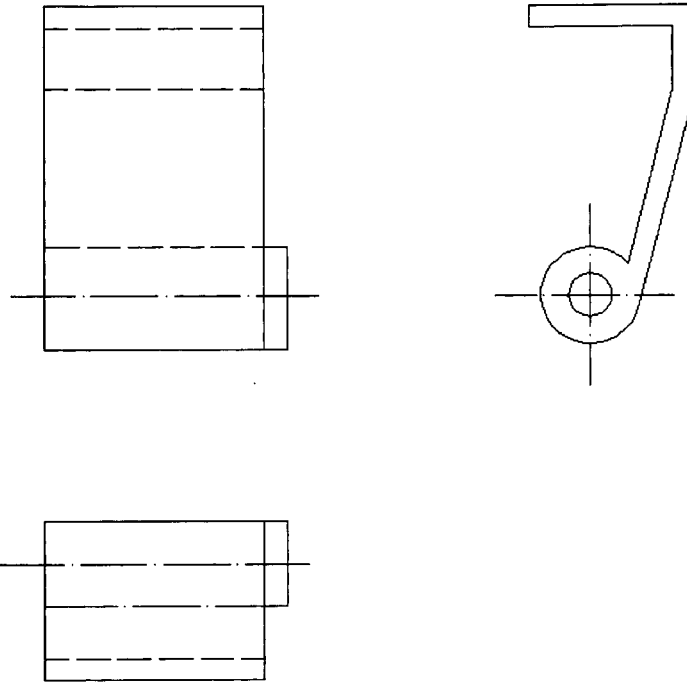


Figure 1.7

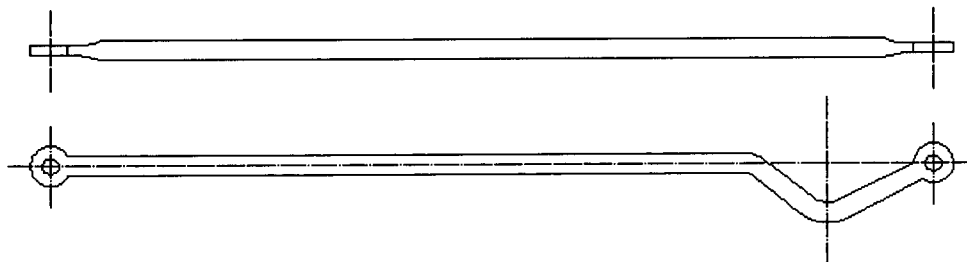


Figure 1.8

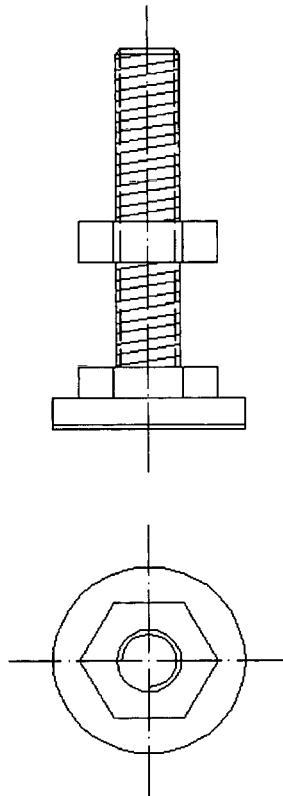


Figure 1.9

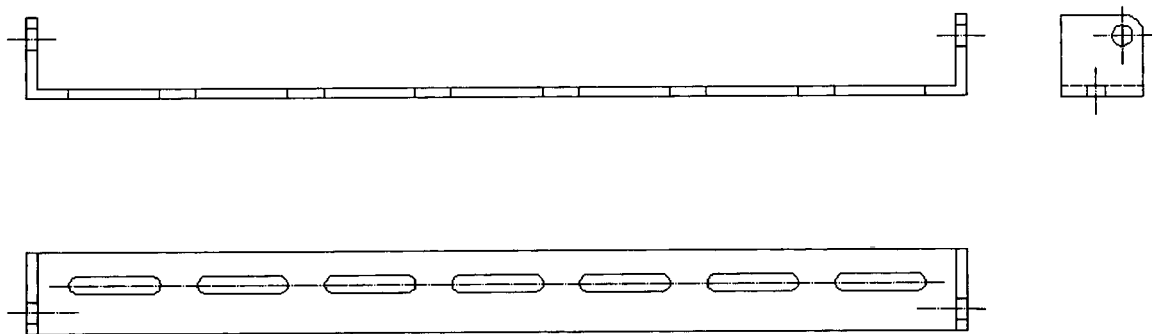


Figure 1.10

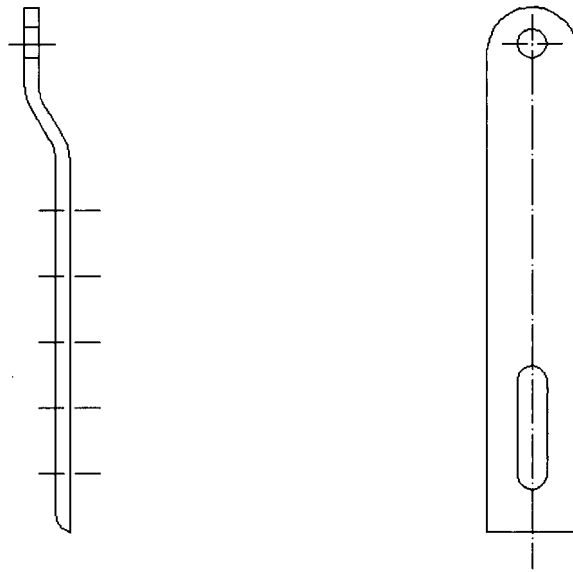


Figure 1.11

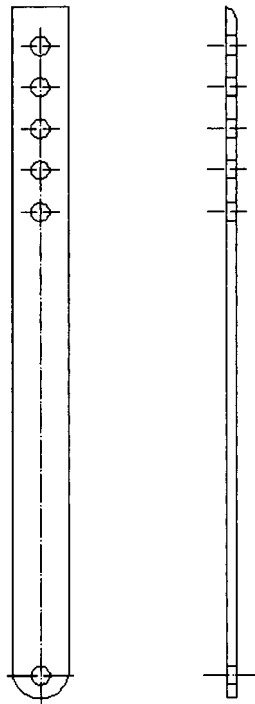


Figure 1.12

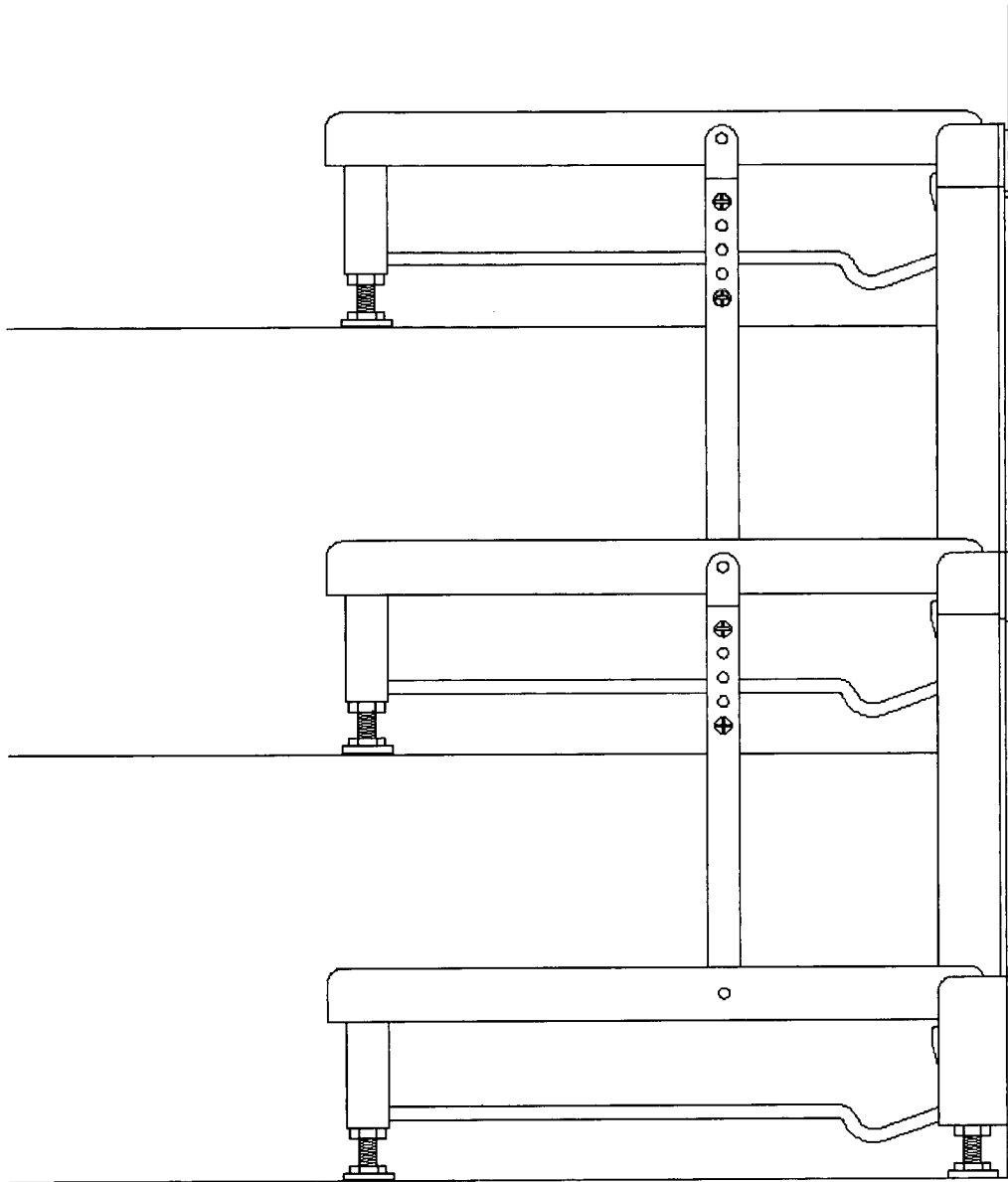


Figure 1.13



EUROPEAN SEARCH REPORT

Application Number
EP 15 38 2529

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EPO FORM 1503 03.82 (P04C01)

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	GB 2 495 414 A (GOODENOUGH CLIFFORD [GB]) 10 April 2013 (2013-04-10) * figure 4 *	1-6	ADD. A61H3/00
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A,P	JP 2014 240563 A (YUNITE KK; SHINDO CORP) 25 December 2014 (2014-12-25) * figures 1,2 *	1-6	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04F A61H
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 21 April 2016	Examiner Arsac England, Sally
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21-04-2016

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