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(54) STEP WITHOUT VISIBLE LEGS FOR USE AT HOME AND OFFICE

(57) It is an integrated step stool at home and office spaces. It is an autonomous model, without visible legs when unfolded. It is developed to hold up all efforts when stepping in as well as all efforts coming from its parts. Can be installed without consuming current usable space, so unnecessary use of extra space by external devices is avoided. Step up exceeds the mark of 50 centimeters and can reach even higher.

It consists of a rigid structure (1) that supports 2 steps (4, 6) which overlap, slide and fold through some bearings (2) until the end of the structure, decreasing the space occupied by the invention. The invention is fixed where the user cannot see, thus giving the impression the steps hold off in the air.

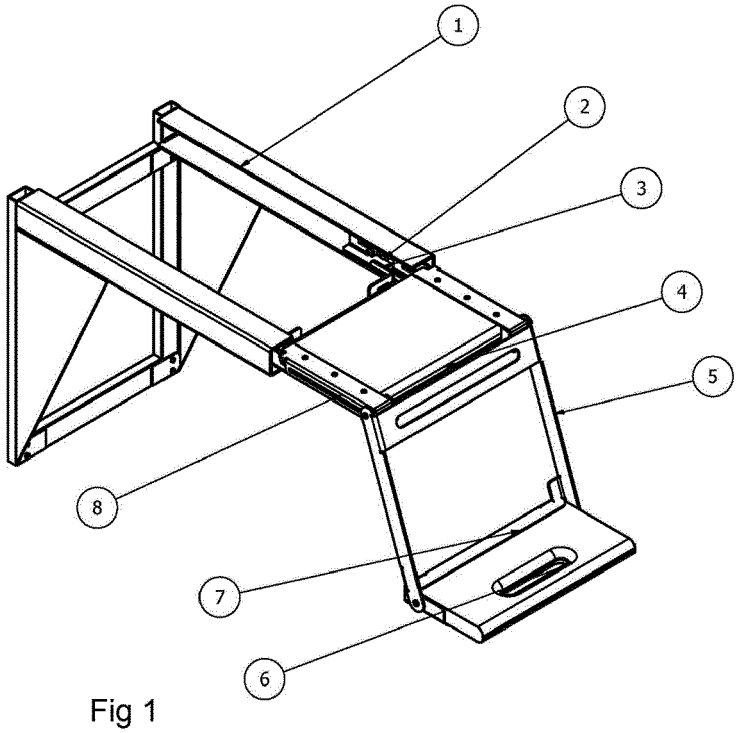

Fig 1

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Description

Industrial application

[0001] Usable space at home is a critical element, regardless of the size of the house.

[0002] Even the people living in big mansions, eventually end up having problems to store everything that accumulates in a life time which is difficult to get rid-off for different reasons.

[0003] Even so more often, furniture producers design ingenious modular solutions to enable further storage of clothing or else, which will not be used immediately. There is a clear trend in the market pushing towards the improved use of the space in height, which implies that it is not always easy to access belongings and therefore, we have to make use of external tools, such as chair, stools or ladders.

[0004] The installation of wardrobes of great height to make good use of higher ceilings is something more and more frequent in the current design of furniture for households, as well as for offices.

[0005] In addition, the height of some people, as well as children, makes it more difficult to reach certain high places at home or in the office.

[0006] Despite there are alternatives such as stools, steps, fixed or movable ladders, etc. all of them present the inconvenience of space consumption as well limits in their reach. Most of them cannot be over dimensioned and present the clear problem of where to be stored when not in use. On top of that, most of them can carry additional burden in terms of safety of use, due to the fact that they have not been design for such use, potentially being a hazardous source for accidents.

Prior technique status

[0007] The invention is directed towards its use as an integrated step stool at home and office spaces. Specifically, it is geared towards its use as an integrated autonomous stool. In such design way, the use of unnecessary storage space or not-fit-for-purpose devices is avoided.

[0008] There are several patents, such as FR2972621, GB2462462 or US2015001005 that describe objects type stool or steps to access spaces in height. However, all of them summarize in a couple of steps, attached to the floor through some legs and that end up occupying more space that its own. Our invention is simpler and has visible advantages in its use and manufacturing.

Explanation of the invention

[0009] The invention is directed towards its use as an integrated step stool at home and office spaces. This is an autonomous model, without visible legs when unfolded. It is developed to hold up all efforts when stepping in as well as all efforts coming from its parts. It is integrated and can be installed without consuming current usable space, so unnecessary use of extra space by external devices is avoided. Step up exceeds the mark of 50 centimeters and can reach even higher.

[0010] It consists of a rigid structure that supports 2 steps which overlap, slide and fold through some bearings until the end of the structure, decreasing the space occupied by the invention. The invention is fixed where the user cannot see, thus giving the impression the steps hold off in the air.

Brief description of drawings

[0011]

Figure 1 shows the invention in its open position with the components narrative.

Figure 2 shows a perspective of the same invention with a posterior view.

Detailed explanation

[0012] This model is divided in two parts: Steps and support structure. Steps act as support for the user, meanwhile the structure secures the combined weight of steps and user. The invention is embedded inside a furniture made out of one or multiple drawers.

[0013] Firstly, the invention is positioned at the height of use, so its use is more ergonomic, providing a better user experience avoiding excessive flex.

[0014] Due to its positioning, it provides a high lift, thus enabling the user to properly access greater heights. Installation is recommended to not exceed excessive heights for comfort of use and safety.

[0015] Secondly, the support structure presents a dual role, enabling the support of the steps as well as the user plus cargo up to 180 kg (limited to 180 kg for safety reasons)

[0016] In figure 1 the invention components are detailed. The smoldered and screwed support structure, 1, is the guide as sustains 2 steps and the movement system. The step has a bearing, 2, that serve for an easy movement through the structure thus guiding the steps, integrated in the design. Underneath, we can find the smoldering assembly, 3, which function is to hold both the upper step, 4, as well as the bearings, 2. A strip, 5, connects the upper step, 4, with the lower step, 6. This union assures a fluid movement versus the structure as it allows for a turn of the lower step, 6, so it may remain at the same height of the upper step, 4. The turn is possible due to a screwed hinge, 7, which allows for the strip to move. The strip is also connected to the base of the upper step, 8. In summary, the system allows that strip and lower step rotate, to reach maximum extension so the lower step gets over the upper step. Once folded, and both steps in the same plane, the bearings, 2, allow the steps to move towards the metallic structure, 1. Once

all is together, it becomes a stable and solid structure, and it can be hidden as a drawer. Visually integrated in the furniture as if it did not exists.

[0017] When the invention is unfolded, the user and cargo weight is push by design to the metallic structure and to the wall that it is anchored. This enables the invention to be very stable, due to the different force pairs which neutralize among them.

Claims

1. The invention is formed by a rigid metallic structure and steps, characterized because the complete structure and the two steps are embedded within the interior of a furniture with multiple drawers, being one of these drawers the one that masks the invention.

2. This invention, according to point 1., is characterized because one of its steps folds over the other through a strip and a hinge, and both can run along into the structure through the use of bearings, which allows the guide to be integrated as part of the furniture.

3. A characteristic of the invention, according to point 1., is that the support of the invention are not visible to the user.

4. The invention has the guides integrated, according to point 1., so it could work with the furniture or independently of it.

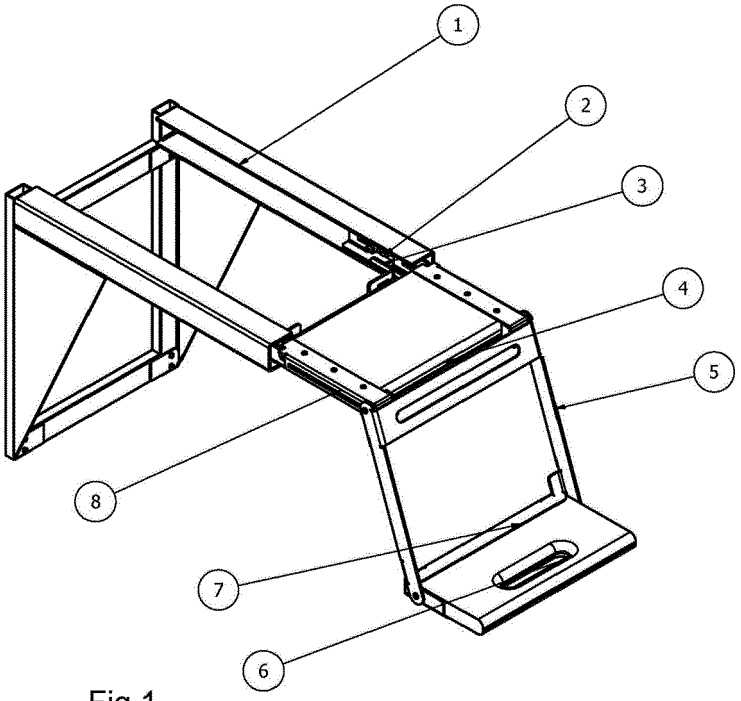

Fig 1

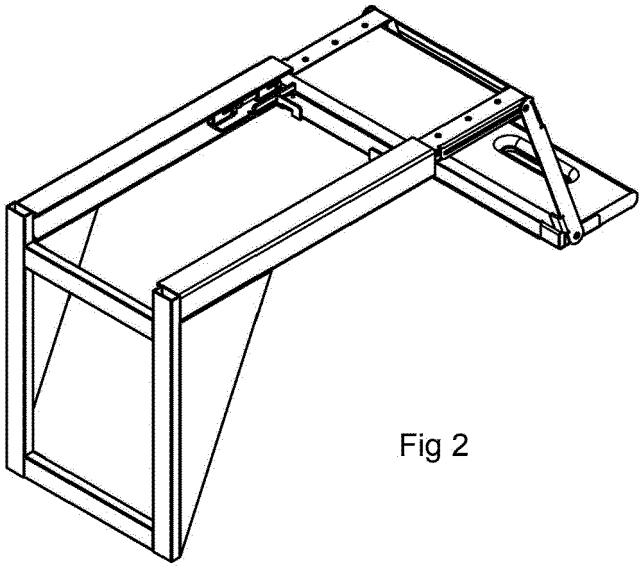

Fig 2

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EUROPEAN SEARCH REPORT

Application Number
EP 22 16 2640

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 7 261 357 B1 (BECHEN NICK R [US]) 28 August 2007 (2007-08-28) * column 4, line 46 - line 67 * * figures 1-3 *	1-4	INV. A47B67/04 E06C1/00 ADD. A47C12/00
X	US 3 834 490 A (FORD R) 10 September 1974 (1974-09-10) * column 3, line 3 - line 21 * * pages 1-3 *	1-4	
X	GB 2 551 967 A (AJC TRAILERS LTD [GB]) 10 January 2018 (2018-01-10) * figures 1-3 *	1-4	
X	US 7 815 266 B2 (HONGFUJIN PREC IND SHENZHEN [CN]; HON HAI PREC IND CO LTD [TW]) 19 October 2010 (2010-10-19) * column 2, line 64 - column 3, line 29 * * figures 1-3 *	1-4	

TECHNICAL FIELDS SEARCHED (IPC)

A47B
A47D
A47C
E06C
B60R

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 August 2022	Bitton, Alexandre

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 22 16 2640

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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19-08-2022

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- FR 2972621 **[0008]**
- GB 2462462 A **[0008]**
- US 2015001005 A **[0008]**