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(71) Applicant: **Agostino Ferrari S.p.A.**
24122 Bergamo BG (IT)

(72) Inventor: **Ferrari, Adelchi**
23848, Oggiono LC (IT)

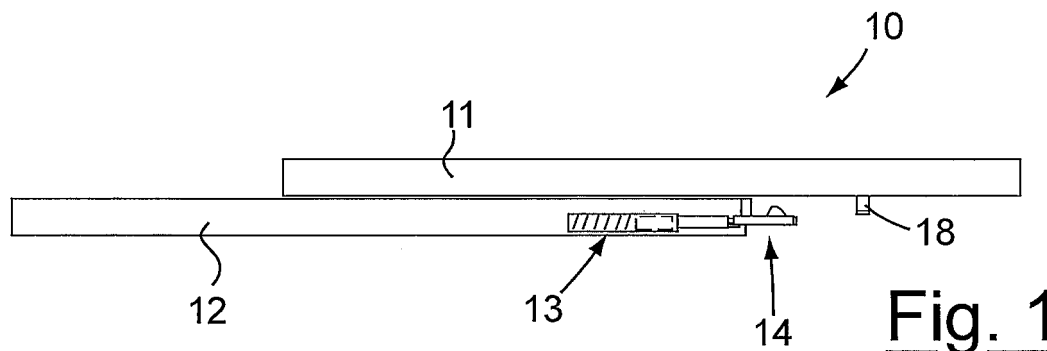
(74) Representative: **Faraggiana, Vittorio et al**
Ing. Barzanò & Zanardo Milano S.p.A.
Via Borgonuovo 10
20121 Milano (IT)

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(54) **Guide with push-pull device for furniture**

(57) A linear guide for furniture comprises two guide parts (11, 12) which mutually slide between a retracted position and an extended position. A push-pull device (13) is integrally joined to one of the two parts and comprises a slider (18) which, when the push-pull device is actuated, slides pushed by its spring and thus pushes a

push member (18) which is integrally joined to the other of the two guide parts. The slider is provided with two staggered parts (19, 20) which operate one for pushing the guide in extension and the other for serving as retention member in retracted position when the two guide parts are close to the retracted position and the push-pull device is in the condition with the slider receded.



Description

[0001] The present finding refers to a linear guide for furniture provided with a push-pull opening system.

[0002] Commonly used in the furniture industry are linear guide systems for opening compartments. This type of openings can be classified in two large categories.

[0003] In a first category the guide/s are positioned longitudinally inside the compartment, they support a second container and they free the space of the compartment at the front part with respect to the operator, common examples being drawers (where the guides occupy the sides of the compartment) or the basket systems (where the guides occupy the upper part and the lower part of the compartment).

[0004] The second category instead provides for an arrangement of the guide/s occupying - with the longitudinal side thereof - the front surface of the compartment in such a manner that access occurs by sliding the shutter vertically or horizontally with respect to the user.

[0005] Common systems of this type are referred to as "sliding", in case of horizontal translation, or "shutter" in case the sliding occurs vertically.

[0006] All these systems require that such devices have both a return system for maintaining the closed position and a handgrip, usually a handle, for allowing opening and thus overcoming the closure force.

[0007] However, there often arises the need to have furniture without any handgrip and/or protrusion, which would obviously make it impossible or at least difficult to open the compartments described above.

[0008] Already known in the furniture industry are push opening systems wherein the opening of the compartment occurs by pushing instead of pulling; the push force that the user is required to impart onto the member that closes the compartment disengages a spring mechanism which completes the opening. Therein, the spring accumulates the energy required for opening during the closure movement.

[0009] The retention of the drawer or shutter at the closed position may occur, according to the prior art, through suitable mechanical engagements or magnetic force. The mechanical engagements usually have moveable parts subjected to wear and jamming and which may have problems related to overall dimensions, while the retention by magnetic force reveals problems regarding dimensioning, especially in the sliding systems such as drawers, where the weight of the object to be retained varies considerably depending on the use.

[0010] A general object of the present invention is that of overcoming the drawbacks mentioned above by providing a linear guide having a simple and efficient push-pull device.

[0011] Regarding such object, conceived according to the invention has been a linear guide for furniture comprising two guide parts which mutually slide between a contracted position and an extended position **characterised in that** it comprises a push-pull device that is inte-

grally joined with one of the two parts and which comprises a slider which, when the push-pull device is actuated, slides pushed by a spring thereof from a retracted position ad to an advanced position and in the travel it pushes a push member that is integrally joined with the other of the two guide parts, in such a manner to move said other of the two parts over a first section towards the extended position, the slider being provided with two staggered lateral teeth along the movement axis of the slider and which are dimensioned and oriented the first for pushing onto the push member towards the extended condition of the two parts and the second for retaining - on the slider - the push member when the two guide parts are close to the retracted position and the push-pull device is in the condition having the slider retracted.

[0012] To clarify the explanations of the innovative principles and advantages of the present invention further with respect to the prior art, described hereinafter, with the help of the attached drawings, is a possible embodiment applying such principles. In the drawings:

- figure 1 represents a side schematic view of a guide according to the invention.
- figures 2 and 3 represent enlarged schematic views of two operative conditions of the guide;
- figure 4 represents an enlarged view of a head slider of the push-pull device of figure 1.

[0013] Referring to the figures, figure 1 schematically shows a linear guide for furniture, indicated in its entirety with 10.

[0014] The guide 10 comprises two guide parts 11 and 12 which mutually slide between a retracted position and an extended position, according to a substantially known art. The sliding mechanism shall thus not be described or shown, given that it may be of any known type. Typically, part 12 is intended to be fixed onto the furniture and part 11 is intended to be fixed onto the sliding member, for example a drawer. Two guides may be used at the sides of the drawer. Even only one of them may be made according to the present invention.

[0015] The guide 10 comprises a push-pull device 13 which is integrally joined to one of the two parts. The push-pull device operates interiorly in a substantially known manner and thus the interior thereof shall not be described in detail. Substantially, it comprises a slider 14 which slides between a retracted position (shown in figure 2) and an extracted or advanced position (shown in figure 3). A spring 15 inside the body 16 of the push-pull device pushes the slider towards the extracted position. A known engagement device 17 engages and allows maintaining the slider in the retracted position when the slider is pushed backwards starting from the extracted position. As known, disengaging the device 17 solely requires pushing the slider inwards further.

[0016] Once disengaged, the slider 14 in the forward travel thereof pushes a push member 18 which is integrally joined to the other of the two guide parts. To obtain

this, the slider is provided with two lateral teeth 19, 20 which are staggered along the movement axis 21 of the slider.

[0017] As clearly observable from the figures, the first of the two teeth (called the push tooth 19) is dimensioned and directed to push against the push member 18 towards the extended condition of the two parts and the second (called the retention tooth 20) is dimensioned and oriented to retain - on the slider - the push member when the two guide parts are close to the retracted position and the push-pull device is in the condition having the slider receded (as shown in figure 2).

[0018] In such manner, when the guide is in the retracted condition, for example corresponding to a closed drawer, shown in figure 2, the push member 18 is fitted between the two teeth 19 and 20 and the drawer is kept firmly closed. However, by simply pushing the drawer inwards by a slight travel (space sufficient to disengage the push-pull device) the slider pushes - by means of the tooth 19 - the member 18 in such a manner to start the opening travel and move the guide parts 11 over a first section towards the extended position.

[0019] As shown in figure 3, after such first section of the travel, the tooth 20 is sufficiently displaced sideways with respect to the member 18 so as to allow surmounting the member 18, in such a manner that the guide may freely continue the extension travel (for opening the drawer) by drawing manually.

[0020] Upon imparting the reverse contraction movement (for closing the drawer) the push member 18 surmounts the tooth 20 again (as shown in figure 3) and pushes the tooth 19 backwards in such a manner to reload the push-pull device. The system returns to the position of figure 2 and the drawer is once again locked at the closed position.

[0021] An elastic yield due to the movement of the various parts may be used to implement the surmounting of the tooth 20 by the push member 18.

[0022] Advantageously, as shown in the figures, the guides may also be obtained with the sliding direction 21 of the slider towards an advanced position which is diverging with respect to the sliding direction 22 of the two guide parts towards the extended position, in such a manner that the push member moves away from the coupling with the second tooth when the first tooth pushes against the push member and moves the guides in the first section towards the extended position. Alternatively, the axes may also be parallel and the push-pull device (as now easily evincible by a man skilled in the art) may have the slider which, at least in the final part of the push travel thereof, has a side displacement movement from the push member to disengage the second tooth from such push member. For example, the push-pull device may be provided, in the moveable part thereof and in the accommodation thereof, a form which causes a side misalignment near the maximum extension position thereof.

[0023] In any case, in order to facilitate surmounting of the retention tooth 20 and simultaneously ensure the

coupling of the push tooth 19, the tooth 20 has a smaller projection from the slider with respect to the projection of the tooth 19.

[0024] In order to facilitate surmounting, the tooth 20 has inclined contact faces with the push member.

[0025] As better observable in figure 4, the slider 14 has the part 23 that bears the teeth which comprises a screw 24 for adjusting the position thereof along the push axis.

[0026] Such screw advantageously has the manoeuvre head 25 facing the head of the slider.

[0027] The screw axially passes through the entire part 23 of the slider and is screwed in the remaining rear part 26 of the slider. The head of the screw is rotatable but axially locked against the part 23 while a projection 27 prevents the rotation of part 23 with respect to part 26. In such manner, by rotating the screw, the part 23 of the slider slides towards or away from part 26. The stop position shown in figure 2 may thus be adjusted. This for example allows adjusting the closure aligning of the front part of the drawer.

[0028] At this point, it is clear how the preset objects are attained by providing a sliding guide with push-pull device by mechanical engagement of sliding parts of furniture and disengagement thereof by means of a pressure action by the user.

[0029] Obviously, the previously described embodiment applying the innovative principles of the present invention is indicated with the sole purpose of exemplifying such innovative principles and thus it shall not be deemed restrictive regarding the scope of the patent described herein.

[0030] Though mentioned herein is a drawer, for the sake of simplicity, the described operation may be applied to any sliding member of a furniture.

[0031] The shape of the sliding guides may vary with respect to that shown in the figure, even depending on the sliding member to be moved. The guides may also be formed in three or more mutually sliding pieces, as easily imaginable by a man skilled in the art.

[0032] Also the definition of guides with sliding parts should be considered broader than a simple guide for drawers and it may comprise other members for the sliding movement of furniture parts.

[0033] It is also easy to imagine a possible kinematic inversion of the moveable parts fixed onto which are the push-pull device and the push member that interacts therewith.

Claims

1. Linear guide for furniture comprising two guide parts which mutually slide between a retracted position and an extended position **characterised in that** it comprises a push-pull device which is integrally joined to one of the two parts and which comprises a slider which, when the push-pull device is actuated,

slides pushed by its spring from a receded position to an advanced position and during the travel it pushes a push member which is integrally joined to the other of the two guide parts, in such a manner to move said other of the two parts over a first section towards the extended position, the slider being provided with two lateral teeth staggered along the movement axis of the slider and which are dimensioned and oriented the former to push on the push member towards the extended condition of the two parts and the latter for retaining - on the slider - the push member when the two guide parts are close to the retracted position and the push-pull device is in the condition with the slider receded.

2. Guide according to claim 1, **characterised in that** the slider has at least - in the end part of the travel push thereof - a side displacement movement from the push member to disengage the second tooth from such push member.
3. Guide according to claim 2, **characterised in that** the sliding direction of the slider towards the advanced position diverges from the sliding direction of the two parts towards the extended position in such a manner that the push member moves away from the coupling with the second tooth when the first tooth pushes against the push member and moves said other of the two parts over the first section towards the extended position.
4. Guide according to claim 1, **characterised in that** the second tooth projects from the slider by a smaller extent with respect to the projection of the first tooth.
5. Guide according to claim 1, **characterised in that** the second tooth has inclined contact faces with the push member.
6. Guide according to claim 1, **characterised in that** the slider has the part that bears the teeth comprising a screw for adjusting the position thereof along the push axis.
7. Guide according to claim 6, **characterised in that** the adjustment screw has a manoeuvre head facing the head of the slider.

